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

to Parliament for Fiscal Year 2014

Report of NIHERST
for Fiscal Year 2014

NIHERST

NATIONAL INSTITUTE
OF HIGHER EDUCATION
RESEARCH SCIENCE AND TECHNOLOGY

INCORPORATED BY ACT OF PARLIAMENT ACT NO. 20 OF 1984

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Additional materials attached:

Promotional material for key science popularisation events and activities

Copies of published surveys and educational publications and DVDs

FOREWORD

The year 2014 was an important milestone year for NIHERST as it marked its 30th anniversary on 28 June. This was an opportunity for the institute to celebrate its many achievements over the decades, which have contributed in truly groundbreaking ways to national capacity building in the tertiary education sector and in science, technology and innovation (STI). NIHERST continues to strengthen its legacy in STI today, most visibly through the extensive science popularisation programme it pioneered in the 1990s. This initiative enabled the institute to become the regional leader in non-formal science education - a key platform for nurturing a wider culture of STI upon which economic diversification and growth rest. One of the commemorative activities was a series of 30 one-minute television features, each highlighting one of Trinidad and Tobago's top scientists. They were selected from the more than 70 scientists featured in the three volumes of the NIHERST publication, *Trinidad and Tobago Icons in Science and Technology*. The videos were aired in July/August during CNMG's news programme, one each evening for 30 days.

In July 2014, a new Board was appointed, with Prof. Prakash Persad, former Ag. Chair, formally taking the helm as Chair. The institute's achievements and activities during the year continued to advance the goals and objectives laid out in its Strategic Plan for 2011-2015. The focus was on the following three objectives of the plan, further details of which are presented under Policy and Development Initiatives:

- Fostering a National Culture of Science, Technology and Innovation. This covers activities under NIHERST's pioneering science popularisation programmes, spearheaded by the National Science Centre, as well as the annual national awards schemes and competitions which the institute stages.

- Research and Intelligence Gathering. The main activities in this area are: the ongoing surveys undertaken and related publications issued by the S&T Statistical Research Department; the work of the Policy Research and Intelligence Gathering Department on formulating a national science and technology policy; and supporting strategic foresight activities to boost development and innovation in priority sectors; and

- Building Strategic Alliances. The focus in this area enables NIHERST to tap into the resources and expertise in global centres of excellence to accelerate progress in STI in areas of importance for national development. In some local and regional collaborative initiatives, NIHERST shares its own expertise to support capacity building in other countries.

In 2014, NIHERST intensified its efforts, via new and ongoing programmes, to foster a national culture of STI, and improve STEM (Science, Technology, Engineering and Mathematics) education, through both the formal education system and its own science popularisation initiatives targeting the general population. Some key developments connected to the former included three new programmes which involved deepening ties and strategic alliances with regional and international partners:

- The initiation of INVOCAB (Improving Innovation Capacities in the Caribbean), a three-year regional project implemented in partnership with the Scientific Research Council(SRC) in Jamaica. Funded by the EU, INVOCAB's aims, inter alia, are to: improve teachers' capacities in science education; implement an innovation framework in selected schools in the Caribbean; and further integrate Science and Technology into the primary and secondary school curriculum.

- The formal launch of NASA's International Internship Program (NASA I^2) now open to post-secondary level STEM students from Trinidad and Tobago. Two students, the first from this region to have this once-in-a-lifetime opportunity and exposure, were selected to intern at NASA's Ames Research Centre in Silicon Valley in the US, undertaking high tech research and receiving first-rate training and mentorship from NASA scientists.

- The launch of Seismology in Schools, which trained teachers from participating schools to introduce the science of geophysics to students from forms three to six, giving them hands-on experience of seismology and a taste of how scientists work, and showing the real world application of the physics, mathematics and geography principles being taught in the curricula.

In science popularisation, the institute staged the seventh Sci-TechKnoFest - its large scale, biennial science and technology festival first held in 1997. The 2014 festival, exploring the theme, "Celebrating Human Ingenuity", ran for three weeks at the Centre of Excellence, and attracting over 55,000 visitors, enjoyed record success and media coverage.

The year also saw a marked increase in requests for NIHERST to participate in events hosted by external agencies, both public and private. This enabled the institute to add to its own outreach activities and impact more communities and target groups across the country. It signals a growing recognition and need by agencies to include more scientific content in their events for the public.

Regionally, NIHERST's expertise in science popularisation has benefitted teachers and students in Barbados in the last FY and St. Vincent and the Grenadines this FY, when staff from its Innovation Department visited those countries under its "Made in the Caribbean" initiative, implemented in partnership with the Caribbean Council for Science and Technology (CCST). The

project enabled trainers from NIHERST's Innovation Department to share their expertise with educators in the region on the models and methodologies used by NIHERST in its invention and innovation vacation camps for young people.

After delays experienced prior to the re-appointment of its Board, NIHERST regained the momentum to proceed with the construction of Science City, with aim of completing Phase 1 A by the end of FY 2015.

In research and intelligence gathering, the S&T Statistical Department published two survey reports and undertook new surveys, in addition to conducting its annual Survey of Science and Technology Indicators. The Policy, Research and Intelligence Department focussed on: refining the Draft National Science and Technology Policy; detailing the operationalisation of the National Science and Technology Fund (NSTF); and mapping the innovation systems of strategic sectors in the Trinidad and Tobago Economy. In 2014, NIHERST also set the wheels in motion for the establishment of a National Science & Technology Database and Country Status Report, the aim of which is to determine the status of science and technology research in Trinidad and Tobago and to develop an updated system of researchers and research institutions that currently exist nationally.

With respect to internal administrative systems, NIHERST laid the foundation for two new departments:

- a Records Department, which would develop the institute's records management programme and implement an electronic document and records management system solution across the organisation; and
- a Monitoring and Evaluation (M&E) mechanism, which aligns the institute with Government's newly developed national system of monitoring and evaluation across all ministries to measure the progress on achievement of development goals and outcomes.

Details for all activities and achievements for the reporting period are presented under the following seven sections requested by Parliament:

1. Vision, Mission, Philosophy and Strategic Objectives
2. Organisational Structure
3. Policy and Development Initiatives
4. Financial Operations
5. Human Resource Development Plans
6. Procurement Procedures
7. Public and Community Relations.

The financial statements contained in this report are not audited.

Materials submitted with this report include copies of publications referred to in the report as well as clippings and flyers that give additional details on key programmes.

Section 1: Vision, Mission, Philosophy and Strategic Objectives

In 2010, NIHERST's valuable role and unique position in the country's institutional infrastructure for advancing national development in STI was affirmed. The new board appointed that year proceeded to shape a Strategic Action Plan 2011 – 2015, aligned with the Government of Trinidad and Tobago's policy framework and the seven interconnected pillars for sustainable development. (See Appendix 1 for a copy of the Action Plan.) The pillars of particular relevance to NIHERST are development pillar 1: People Centred Development and development pillar 5: Creating a More Diversified, Knowledge-Intensive Economy. The plan was completed in January 2011 and was limited by the information available at that point in time.

The following operational goals and expected outcomes were outlined in the plan:

Operational Goal 1: Research and Intelligence Gathering in Support of Economic Diversification

The studies undertaken will guide Trinidad and Tobago on the best way the country can utilise STI to rapidly improve its global ranking in competitiveness and create a sustainable knowledge-based economy. They will also promote the use of renewable energy and other technological advances to create sustainable wealth generation and employment for citizens and a consequent reduction in poverty. The five growth poles would become best practice examples of sustainable communities in the Caribbean. The National STI Policy would become a model for other small island developing countries. The development of a National Knowledge Network for sharing and disseminating knowledge within and among research and academic institutions, Government and other stakeholders is another long-term outcome that this focus area can influence.

Operational Goal 2: Promoting Innovation and Commercialisation of Technology in Priority Areas

It is expected that the creation of a fund for the commercialisation of technology and the undertaking of R&D and technical studies, based on international best practice for managing risks, will make for greater success of commercial ventures and will contribute towards Trinidad and Tobago becoming a knowledge-based economy. Priority will be given to the creation of enterprises that are sustainable and innovation-driven, align to the development of the identified growth poles, and contribute to poverty eradication in the country.

Operational Goal 3: Building Collaborative Global Relationships

The institutions that NIHERST collaborates with will contribute financial, human, information and infrastructural resources to assist Trinidad and Tobago in developing a competitive, knowledge-based economy. The relationships will also promote NIHERST's and Trinidad and Tobago's international image and international standing in STI and global competitiveness.

Operational Goal 4: Positioning NIHERST as a World Class STI Institute

It is expected that the operational efficiency and effectiveness of NIHERST will be improved and the institute's brand name will gain greater recognition at home and abroad as a leading institution in STI.

Operational Goal 5: Fostering a Culture of Science, Innovation and Creativity

The development of a culture of science, innovation and creativity will lead to improved performance of primary and secondary schoolchildren in science subjects. It will also increase the innovation activities of existing enterprises, the number of patents approved for local citizens, and the number of technology-based start-ups by young entrepreneurs.

Objectives

These operational goals are built on NIHERST's identified strengths and provide the areas of strategic focus for the organisation in the context of its mandate, its capabilities and its role in the matrix of related institutions, as well as in the dynamic and evolving global environment.

The objectives of these operational goals/specific areas of strategic focus for NIHERST can be summarised as follows:

1) Research and Intelligence Gathering In Support of Economic Diversification

- To provide policy support and advocacy to its line ministry in developing a national STI policy;
- To undertake STI policy studies in support of economic diversification - e.g. innovation and foresighting studies in priority areas;
- To undertake international benchmarking and comparative studies on Research & Development (R&D)/STI, competiveness and innovation in selected countries, regions, sectors and areas; and
- To develop a strong capability for knowledge management to support the knowledge-based economy and an effective National System of Innovation.

2) Promoting Innovation and Commercialisation of Technology in Priority Areas

- To establish a technology commercialisation fund (public-private partnerships including venture capital and angel investments) to help finance start-up enterprises in priority areas and niches identified in studies by NIHERST, including its foresighting "best bets"; and

- To establish a contestable fund for increasing national R&D in identified niches and priority areas.

3) Building Collaborative Global Relationships

- To build international relationships with world-class STI institutions; and
- To establish and maintain linkages with specialised regional and international research, science and technology institutions, and initiate and implement joint STI projects of relevance to the rapid creation of a sustainable knowledge-based economy.

4) Positioning NIHERST as a World Class STI Institute

- To restructure NIHERST in line with the Strategic Plan;
- To develop a plan for the physical consolidation of offices; and
- To develop a strategy to brand NIHERST as a world class STI institute.

5) 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.

The Strategic Action Plan is built around the Objectives derived from the Operational Goals. For each objective, we identify measures, targets, strategic initiatives, timeframes, resources required and accountabilities. Appendix 1 refers.

Section 2: Organisational Structure

a) Organisational Profile

Over the years, NIHERST has developed distinctive competencies in the three key focus areas in science and technology: science popularisation, applied research on STI to inform policies, and external collaboration to advance the development and application of STI, both nationally and regionally. The following gives a broad picture of the organisation's competencies in these areas.

1. ***Fostering a strong national culture of science, technology and innovation through its programmes in science popularisation, science communication and STEM (science, technology, engineering and mathematics) education.*** These are delivered mainly through the in-house and community outreach activities of the National Science Centre's (NSC) in D'Abadie. NSC is the only facility of its kind in the Caribbean and contains over 200 interactive science exhibits and manipulatives. It occupies an area of 65,000 sq. ft. of exhibit and office space and visitor facilities. The programmes of the centre seek to support classroom science learning using engaging teaching strategies; to illustrate how science and technology permeate all aspects of daily life; and to reduce the barriers between science and society.

   Through its Innovation Department, NIHERST has also pioneered programmes and activities that develop young minds to be creative, inventive and even entrepreneurial using science and technology, which is a key component in the shaping of a cohesive national innovation system. The department focuses on: (a) the staging of the biennial Prime Minister's Awards for Scientific Ingenuity (formerly the Prime Minister's Awards for Innovation and Invention); (b) the conduct of formal and non-formal training in creative thinking, the process of innovation and invention, and entrepreneurship for students, notably through one of its flagship programmes, the Community Centred Design and Innovation (COMDESI) project run in partnership with the Heroes Foundation, as well as its annual Robotics, Cre8tivity and Young Inventors camps for children 5-17 years); (c) the staging of exhibitions and outreach activities that build awareness of innovation and invention; and (d) giving assistance to local inventors for protecting creative ideas, developing prototypes and attending international invention expositions.

   In 2011, NIHERST reinstated and rebranded its Awards for Excellence in Science and Technology, recognising the imperative of highlighting and honouring the achievements of nationals working in all scientific fields, both at home and abroad. Creating a more diversified, knowledge-based economy depends to a significant degree on the understanding and regard that the wider national community has for the role of science and technology in development, and for those who contribute to that advancement.

2. ***Demonstrating a strong focus on research and intelligence gathering in the fields of science, technology and innovation (STI).*** A specialised capacity to collect and analyse data and information on STI indicators has proven invaluable to NIHERST's role in the provision of policy advice and prescriptions to the Ministry. Created in 1997, NIHERST's S&T Statistics Department compiles data to inform S&T policy formulation and planning. The institute has played a key role in STI planning and the preparation of three draft national policies on S&T over the period 1997-2013. Its Policy, Research and Intelligence Department (PRID) is responsible for drafting the national S&T policy, while its International Projects Department is spearheading the establishment of a National Science & Technology Database and Country Status Report.

3. ***Building linkages with regional and international organisations and managing collaborative projects in research, science and technology sponsored by external agencies***. The International Projects Department manages collaborative projects with external agencies such as the Organization of American States (OAS), the UN, and the CTA ACP, NASA, Scientific Research Council (SRC) of Jamaica, University of Leicester, Durham University, Imperial College London, the British Geological Survey (BGS) and the US Embassy in Port of Spain. The unit also supports the operations of the Caribbean Council for Science and Technology (CCST) and the Global Water Partnership-Caribbean (GWP-C) whose secretariats are hosted by NIHERST.

b. **<u>Services/Products</u>**

The following summarises the services and products that NIHERST provides to the national community:

1. Science popularisation

National Science Centre	Tue-Fri 9:00 a.m.-4:00 p.m. Under 5 years: Free, 5-17 years : $10 & 18 years and over: $20 Hands-on exhibits and activities on: animation, astronomy, energy, the environment, disaster awareness, the human body, music, sports and wellness, robotics and more. Schools can plan special science themed visits.
Sci-TechKnoFest	Mega science and technology festival held biennially on a specific theme. Past festivals have covered: science in everyday living, connectivity, energy, the environment, health and wellness, creativity, innovation and sustainability, and inventions. Admission – price varies
Caribbean Youth Science Forum (CYSF)	Annual, week-long programme of lectures, workshops, field trips, design challenges and more for regional lower sixth form science students. Local participants - TT$900; Regional - US$150
Community Science Weeks	Rural and underserved communities come alive with science, technology and innovation. The content is driven by community needs. Free admission

Robotics, Creativity & Design	The Robotics and Creative Design Labs – workshops, road shows and themed visits at the National Science Centre
Vacation Camps	A variety of STI themed camps ranging from 1 to 3 weeks Various venues in Trinidad and Tobago July/August vacation period for children 5-17 years Price varies from TT$100 plus per week
Clubs	Science Club Free to join SciEng Club Free to join Robotics Club TT$100 to join
Community Centred Design and Innovation (COMDESI)	Forms 3 and 4 students acquire a working knowledge of the innovation process and engage local communities in developing innovative solutions to real life community problems. 8 secondary schools annually Hosted for free
Science Road Shows	Target primary science education, particularly in schools in underserved areas, and help to bring to life concepts being taught at that level Hosted for free
Workshops for Secondary Students	Focus on difficult areas of the CSEC examinations in physics, biology, chemistry and math Hosted for free
Outreach through events staged by external public and private agencies	NSC and the Innovation Department are invited to exhibit at events hosted by government agencies, NGOs, schools and private bodies on specific needs relevant to the needs of society and their own celebrations.
Educational Resource Materials	Print and DVD resources including online downloads Some examples: - Caribbean Women in Science and their Careers - Climate Change: The Basics, Impacts and Taking Action - Disaster Awareness Series (Floods, Landslides, Forest Fires) - Icons in STI series (5 publications) - Making Maths Easy - Natural Wonders of the Caribbean Parts 1 & 2 - Science for All (Understanding Volcanoes and Oil Spills) - Science Music Videos (different topics)
National Awards and Competitions	- Awards for Excellence in Science and Technology - Prime Minister's Awards for Scientific Ingenuity - Science Music Video Competition

2. Research and intelligence gathering

S&T Statistical Department	Conducts surveys on science, technology and innovation (STI) and analyses the collated data to inform policy formulation and planning. Publications available at TT$50.00 or US$12.00 See: http://www.niherst.gov.tt/research/research-statistics.html Examples - Survey on the Public Perception of Science 2012 - Survey of Science in Secondary Schools 2011
Policy Research and Development Department	International benchmarking and comparative studies on STI, policy support and advocacy in developing a national STI policy; advice to other agencies; innovation mapping?
International Projects Department	National S&T Research Database for Trinidad and Tobago

3. Special projects and collaborative relationships

Collaborating Agency	Project
Caribbean Council for Science & Technology (CCST), CTA ACP-EU, CARDI, UWI and the Trinidad & Tobago Film Company	Caribbean Science and Agriculture Film and Video Competition and Caribbean Tales Film Festival
NASA	NASA International Internship Program tenable at NASA Ames Research Center, California, USA
Scientific Research Council (SRC), Jamaica	Improving Innovation Capacities in the Caribbean (INVOCAB) project
University of Leicester, Durham University, Imperial College London, the British Geological Survey (BGS), the Ministry of Education and the UWI Seismic Research Centre (SRC)	Seismology in Schools project
U.S. Embassy in Port of Spain	National Youth Science Camp, West Virginia, U.S.A.
Toco Foundation, Global Water Partnership- Caribbean (GWP-C)	Eco-Solutions: Environmental Solutions for Sustainable Communities

With the construction of Science City in Couva, which will accommodate the headquarters of NIHERST and a state-of-the-art, permanent national science centre (to replace the rented facility at D'Abadie), the institute will be expanding in exciting new directions, to better serve, educate and engage the national community and citizens of all ages. New offerings will include internships, research and investigation opportunities for students at all levels.

Business locations

During the reporting period, NIHERST was housed at three (3) locations as follows:

1. Head Office – 77 Eastern Main Road, St. Augustine
2. Marketing and International Projects – 8 Serpentine Road, St Clair
3. National Science Centre – Cor. Old Piarco Road, D'Abadie.

b) Corporate Structure

NIHERST is governed by a Board of Governors whose term of office is for a period of three years. The NIHERST Act allows for 14 members, excluding the NIHERST president who is a member ex officio. During the reporting period, the term of office of the Board expired on November 23, 2013 and the new Board was appointed on July 3, 2014. The members (excluding the president) were as follows:

Prof. Prakash Persad –Chair
Mr. Brian Juanette – Deputy Chair
Mr. Ralph Campbell – Member
Mr. Cecil Caruth – Member
Mr. Raphael Esdelle – Member
Prof. Stephan Gift – Member
Mrs. Patricia Lee-Browne - Member
Dr. Rawatee Maharaj-Sharma – Member
Mrs. Zorisha Mohammed-Ali - Member
Dr. Annmarie Phillip-Hosein- Member
Ms. Denice Ramdhan – Member
Mr. Nicholson Sookhoo - Member
Mr. Andre Thompson – Member.

This Board met five times between its appointment and the end of this reporting period. There were three standing committees - Human Resource, Finance and Audit - that were established to consider matters in their respective areas and provided recommendations to the full Board.

The executive leadership team comprised a cadre of senior officers who had helped to build the institute from its inception as well as a new generation of leaders. The team comprised:

President – Mrs. Maureen Manchouck
Vice President of Science and Technology – vacant (since 1991)
Registrar & Head of International Projects – Ms. Joycelyn Lee Young
Senior Human Resources Officer – Mrs. Giselle Dinzey
Senior Accountant – Mr. Nazir Mohammed/Ms Sylvia Lalla
Senior Statistician – Mr. Daniel Deen
Science Education Advisor - Ms. Althea Maund/Ms. Larrisa Mohammed
Senior Policy Analyst – Ms. Julie David
Systems Analyst II – Mrs. Kathy-Ann Joseph Creese
Administrative Officer IV (NSC) – Mrs. Kalawati Sookhram
Administrative Officer IV (General Administration) – Mrs. Lorraine Rollock.

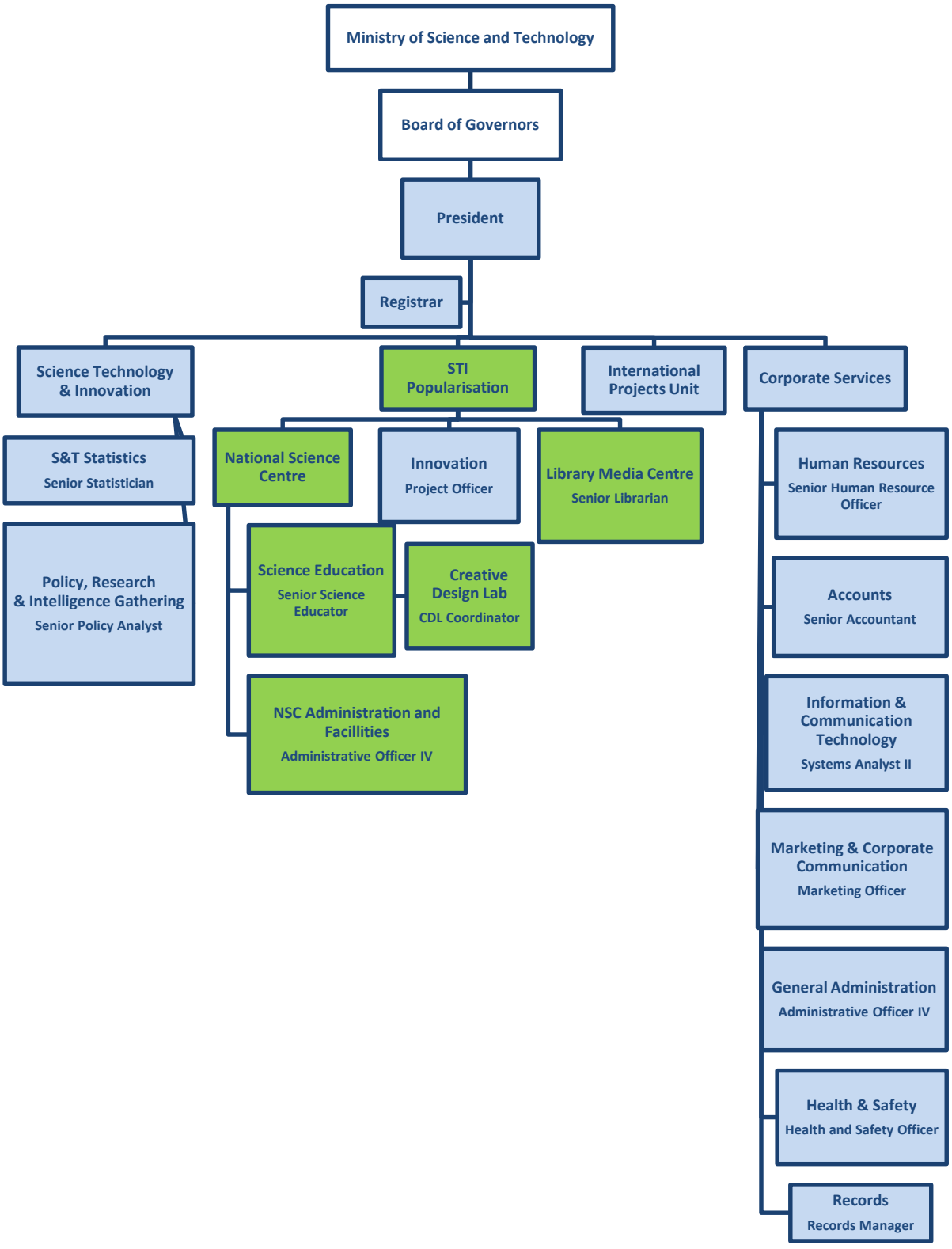
The institute's corporate structure by function, as at 30 September 2014, comprised the key operational areas and departments/units outlined in the chart entitled NIHERST Organisational Structure.

The departments perform the following functions:

- Science, Technology & Innovation (STI). The two departments falling under this area are responsible for STI statistical research, and STI policy research and intelligence gathering. The overall head is the Vice President of Science & Technology, a position that is unfilled. However, heading the S&T Statistical Department and the Policy Research and Intelligence Department are the Senior Statistician and Senior Policy Analyst respectively. They both report to the President. The policy department has a cadre of three officers and the statistical department four officers, who are supplemented by field officers, consultants and other contracted personnel as needed.

- STI Popularisation. This is NIHERST's largest area of operation. The majority of programmes are implemented and administered through National Science Centre (NSC) in D'Abadie, which is responsible for supporting science education in the classroom and conducting out of school programmes to inspire and nurture minds in science and technology. There are three key departments under NSC: (a) the Science Education Department, which is led by a Science Education Advisor; (b) Library Media Centre, which houses a special collection of resources in S&T Policy and Science Education, and which is headed by a Senior Librarian; and (c) Administration and Facilities, which is led by the Administrative Officer IV. Complementing NSC's work is the Innovation Department, which undertakes initiatives to seed a culture of creativity, inventiveness and entrepreneurship ("technopreneurship"). The department is headed by a Project Officer and operates the Creative Design and Robotics Laboratories at NSC. The Innovation Department and NSC have a cadre of 14 and 60 officers respectively.

NIHERST ORGANISATIONAL STRUCTURE



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- International Projects. This department manages the regional and international projects in which NIHERST is engaged, as well as special collaborative projects with other national entities. The department is headed by the Registrar and has a staff of eight officers.

- Corporate Services. Under this operational area falls the key corporate services of: (a) human resource management (recruitment, compensation and benefits, staff development and training, and industrial relations), which is directed by the Senior Human Resource Officer who supervises seven officers; (b) accounts, which has responsibility for budgeting, finance and accounts, and is headed by the Senior Accountant who supervises three officers); (c) ICT (hardware and software support, database management, etc.) which is directed by the Systems Analyst 11, who supervises four officers; (d) general administration (property and facilities management, security, etc.), which is headed by the Administrative Officer IV, who supervises a staff of 12 officers; (e) health and safety led by the Health & Safety Officer, who supervises two persons; (f) marketing and communications staffed with a Marketing Officer and six assistants and (g) the newly introduced Records Department led by the Records Manager who supervises and oversees the work of the Records Assistant and a cross-departmental team of record stewards.

- Registrar. This officer performs the function of Secretary to the NIHERST Board of Governors and such other duties as assigned by the Board, as per Section 9 of the Act establishing the institute. The Registrar is responsible for preparing and securing the minutes of meetings of the Board, copying the same to the line Minister, as well as being the custodian of the seal of the institute.

c) Delegated Levels of Authority

The Board has not delegated any of its functions to the President. The President, as the head of the organisation, oversees all operations and, in the absence of the Vice President for S&T, the President's authority for oversight falls with the Registrar. According to the institute's procurement policy, a department head can approve expenditure up to $25,000.00 for specified operational goods and services, which include inter alia stationery and office supplies, utilities, maintenance services, and up to $10,000 otherwise. The President and, in her absence, the Registrar can approve expenditure up to $75,000.00 for specified operational goods and services. Any other expenditure exceeding these levels up to $450,000 would require final approval from the President as recommended by the Management Tenders Committee. See Appendix 2 for the procurement policy.

d) Legislative and Regulatory Framework

NIHERST was established via Act of Parliament No. 20 of 1984 (Chapter 39:58 of Laws of Trinidad and Tobago). A copy is attached hereto in Appendix 3. The Act places the institute under a ministerial portfolio for policy and other direction. Ministerial control is defined in more detail below.

The Act sets out in Section 12 the functions of the institute, which include:

a) providing and promoting scientific and technological services;
b) promoting and developing an indigenous capability in science and technology relevant to the developmental needs of the country;
c) assisting national bodies and/or organisations in securing technology appropriate to their needs;
d) promoting and operating facilities for higher and continuing education and in particular to:
    i. undertake, promote and facilitate scientific and technological research and development and the provision of scientific and technological services;
    ii. provide, promote and facilitate the provision of continuing education and specialised training at the post-secondary level;
    iii. develop and collect information on scientific and technological development, to evaluate technologies used in or to be imported into the country and to facilitate the dissemination and application of new technologies;
    iv. assist persons and organisations in securing access to technology appropriate to their needs;
e) discharging such other related functions as the Minister may assign to it from time to time; and
f) undertaking all things necessary, incidental or ancillary to the efficient discharge of its functions.

The Act gives NIHERST the powers, with the approval of the Minister, to:

a) establish divisions or departments, research centres and such other facilities as it considers necessary for the discharge of its functions;
b) establish on its own behalf or jointly with other persons approved by the Minister research centres and such other facilities as it considers necessary for the discharge of its functions;
c) undertake activities in the fields of research, science, technology, specialised education, continuing education and related matters, and the provision of scientific and technological services;
d) designate certain training institutions as approved bodies for the purpose of providing specialised training and continuing education;

e) establish and administer examination councils and award certificates, diplomas and other evidence of competence;

f) charge fees for services; receive grants, bequests, donations and gifts; be a beneficiary under covenants; and establish and administer trusts for the purpose of discharging its functions;

g) employ officers necessary for the discharge of its functions at such remuneration and on such other terms and conditions of employment as it thinks fit;

h) give certificates of distinction to institutions or persons making outstanding contribution in its fields of concern;

i) liaise with external programmes in research, science and technology and the provision of scientific and technological services; provide representation on behalf of the Government on same; and advise the Minister on co-operation with other countries on scientific and technological activities; and

j) invite and accept the co-operation for the purpose of devising, funding and operating programmes related to its activities.

The Minister exercises control over policy direction, finances and the appointment of the President of the institute, apart from the exercise of the above-mentioned powers. Specifically, the line Minister has the power to:

a) advise the President of the Republic of Trinidad and Tobago on the appointment of the President of the institute inclusive of remuneration, terms and conditions of employment, as well as the termination of such appointment;

b) determine the remuneration and allowances payable to persons appointed to committees set up by the Board and who are not Board members per se;

c) direct the Board on policy matters and on the discharge of its functions or the exercise of its powers; and

d) give approval for:

- the payment of the annual salary of officers or employees in excess of $50,000, or such greater sum as the Minister may by Ordinance determine;
- the build up of reserves and their investment in securities;
- the borrowing of money in excess of $100,000 to discharge its functions;
- varying by Order the amount that may be borrowed; and
- the pledging of the institute's assets as security for any loan.

<u>Finances</u>

With respect to finances, NIHERST is governed by Guarantee of Loans (Statutory Authorities) Act regarding loans, as per Section 20 of the NIHERST Act. Other governing regulations are as follows:

a. The Financial Regulations – 1965
b. The Financial Instructions – 1965
c. Exchequer and Audit Ordinance

d. Call Circular issued by the Ministry of Finance for the relevant year in which the Budget is due.

Human Resource Management

NIHERST adheres to the following acts and governing regulations:

a. Industrial Relations Act 23 of 1972, Chapter 88:01
b. Maternity Protection Act, 1988
c. Minimum Wages Act 35 of 1976, Chapter 88:04
d. Equal Opportunity Act, 2000
e. Occupational Safety & Health Act, 2004
f. Workmen's Compensation Act 24 of 1960, Chapter 88:05
g. Retrenchment and Severance Benefits Act 32 of 1985
h. NIHERST-PSA Collective Agreement (January 1, 2005 to December 31, 2007)
i. NIHERST-PSA Memoranda of Agreement for cost items for the period January 1, 2008 to December 31, 2010 dated August 19, 2011, August 16, 2012, and August 23, 2013.

f) Reporting Functions

The Act requires the Board to take policy directions from the line Minister. This is done via the Chairman, who must apprise the Minister on a regular basis, both on policy and operational matters pertaining to the institute.

The Board gives directions to the President on strategic and institutional policy matters as well as policy directions set by the Minister. The President reports to the Board on the operations of the institute including finance, procurement, human resources, and matters of policy. The President also takes instructions and reports to the Permanent Secretary of the ministry on matters referred to the institute by the Permanent Secretary. By law, the President is required to submit an annual report on the activities of the institute within six months of the end of each financial year to the line ministry. Reports on achievements have been submitted as required for inclusion in the ministry's annual report.

In addition to the above, NIHERST also reports on its finances and budget, both annually and monthly, to its line ministry and the Ministry of Finance. It reports monthly, quarterly and annually to these ministries and the Ministry of Planning and Sustainable Development for funds under the PSIP. Quarterly and annual reports are also submitted to the Office of the Prime Minister. Special reports are submitted on request, as needed.

Section 3: Policies and Development Initiatives

a) Policies

NIHERST has been spearheading the formulation of a draft national S&T Policy to focus the investment in S&T in the country, to support Government's development goals and identified thrust as outlined in the Medium Term Planning Framework and other relevant policy documents. It will also steer the institute's strategic direction and work programme. Details of work done on the policy during the financial year (FY) 2014 are given in Section 2.2 below.

b) Short, medium and long term plans

During FY 2014, the work undertaken by NIHERST, in accordance with and advancement of its 2011-2015 Strategic Plan, focussed on the following three strategic areas:

- fostering a national culture of science, technology, innovation and entrepreneurship, including an extensive science popularisation programme and national awards schemes;
- undertaking strategic research and intelligence gathering in science, technology and innovation to inform policy development and guide public and private sector investment, towards greater economic diversification; and
- promoting national advancement in science, technology and innovation through establishing and strengthening collaborative relationships with institutions of excellence worldwide.

In 2014, the institute refined and expanded core activities and introduced new initiatives, all aimed at strengthening national capacity in science and technology to better support Government's development agenda and, in particular, economic diversification. The activities built on the achievements over the past three years, accelerating progress on the implementation of the Strategic Plan. The institute continues its leadership role in national STI development in accordance with its mandate, and to advance the mission and goals of the Ministry of Science and Technology.

c) Performance Objectives and Accomplishments for FY 2014

The wide range of programmes and initiatives undertaken by the various divisions of the organisation fall within the three strategic areas cited above (Section 3, b), and are fulfilled inter alia through the continued development of informal and innovative teaching and learning methodologies for national advancement in STI; ongoing surveys of key sectors and areas of importance to STI development, and data dissemination to specific stakeholder groups; policy development; advising Government on priority areas for, and funding of, R&D; mapping

innovation systems; and the fostering and strengthening of strategic alliances with national, regional and international agencies.

Strategic Goal 1: Fostering a national culture of science, technology and innovation

1.1 Construction of NIHERST Science City

NIHERST will be establishing a unique Trinidad and Tobago Science City model for the 21st century that will involve children, teenagers, young adults and their families directly in the process of science and innovation, by tackling real world issues of climate change, food security, water stress, renewable energy, inter alia; engaging leading scientists, and promoting trial-and-error experimentation. The project's objectives are to:

- Grow and excite the next generation of science-confident citizens by providing a fun place for opening young minds to the sciences and for developing a culture of innovation;
- Act as a catalyst for the revival, growth and socio-economic development of the Couva region, preserving significant science and technology aspects of our national heritage and providing a unique tourism attraction to international visitors;
- Form a national hub around which organisations and associations in fields such as environmental awareness, astronomy and health care can widen their appeal to new audiences;
- Provide employment for secondary school and tertiary graduates through internships, part-time and full-time employment, and opportunities for the conduct of experimentation, research and development, and innovation;
- Complement and help to improve science education in the primary and secondary school system and provide training for teachers in self-directed discovery learning; and
- Release rental/leased office facilities, thereby effecting savings.

The project will be implemented in two phases that will see the construction of a state-of-art, purpose-built National Science Centre and high tech laboratory facilities that will facilitate R&D and commercialisation and innovation-based technology adaptation; and to provide experiential science learning facilities for developing a population and workforce that is scientifically literate, technology savvy, and innovative. Phase 1 will comprise the planning, design and construction of the following facilities:

- Main building: comprising exhibition halls, laboratories, kiddie learning and play areas, offices, storage facilities, bathroom facilities and a food court.
- Outdoor science park which will feature educational and fun attractions with a focus on cutting-edge areas of science and technology.
- Planetarium

- Amphitheatre
- Staff and maintenance building along with food kiosks and restroom facilities, which will serve both staff and visitors to the outdoor science park.

Phase 2 will comprise an iconic, green science centre featuring state-of-the-art interactive exhibits, NIHERST Headquarters building, and an additional workshop building.

1.1.2 Activities during FY 2014

a) Pre-Construction Works: Ongoing Contracts and Status of Works as at September 2014

i. Contract for the Provision of Boundary Fence - This contract was awarded in July of 2013 to Mc. Clatchie Construction Company Ltd. The contractor experienced significant delays due to non-availability of the fencing materials from the sole local supplier. The Contractor was granted an extension of time to complete the works. As at September 2014, the works were 95% completed.

ii. Contract for the Provision of Grass and Bush Cutting Services– This contract was awarded to Prolas Ltd. in September 2014 and subsequently renewed in July 2014. As at September 2014, the works were 50% completed.

b) Architectural, Architectural Landscaping & Engineering Designs - The contract for the provision of architectural, architectural landscaping and all engineering design services was awarded to Arquitectonica International Corporation (Prime Consultant) in March 2014. Sub-consultants to Arquitectonica are as follows:

- Arquitectonica Geo – Landscape Architect
- Thinc Design – Exhibit Designer
- acla:works – Architect of Record
- CEP Ltd. in association with Ramps Engineering Services Ltd. - Civil, Structural and MEP Engineers.

Status of Works as September 2014:

- Status of Architectural Designs:
- Site Plan – 100% completed

Concept Designs –80% completed

- Status of Engineering Designs:
- Concept Designs – 20%.

Due to a delay in the appointment of the NIHERST Board of Governors, the contract for design services was not fully executed until July 2014. As such, works under the contract did not commence until July 2014.

c) Quantity Surveying Services - A contract for the Provision of Quantity Surveying Services was awarded to BCQS International Ltd in September 2014.

d) Statutory Approvals

Approvals granted as at September 2014 were as follows:

- EMA Approval – Certificate of Environmental Clearance (CEC 3718/2012) was granted to NIHERST on 15 November 2013.
- Town and Country Planning Division Approval – Outline approval was granted to NIHERST on 27 January 2014.

As at the end of the reporting period, WASA's outline approval was pending pursuant to a request made early in May 2014. NIHERST was advised by WASA that the initial application had been misplaced and resubmission of the forms was required. The application forms were re-submitted at the end of May.

1.2 Science Popularisation

Fostering a culture of creativity and innovation propelled by advancements in scientific knowledge and technology is a complex and long-term development task. It requires a multi-pronged approach that more fully engages the general public, students of all ages, and business and educational institutions.

All countries today require their populations to be highly trained in the new and emerging scientific technological disciplines that are now driving growth, prosperity and global competitive power. These include robotics, biotechnology, nanotechnology and the ongoing advancements in ICT. The building of a critical mass of dynamic and creative scientific and engineering professionals rests on early and on-going nurturing of interest in science and technology, and high quality education - both through a modernised formal education system as well as through complementary, timely and frequent informal educational experiences that can inspire students and show science in a real world, relevant context beyond the classroom.

The **National Science Centre (NSC)** has been the main vehicle through which the institute implements its diverse science popularisation programme. Situated in D'Abadie on over 60,000 square feet of land, the centre holds almost 200 highly interactive exhibits in thematic areas such as robotics, astronomy, energy, the environment, animation, disaster awareness, the human body, music, sports and wellness, creativity, invention and innovation, physical disabilities, and road safety. In the Techkno Theatre, visitors of all ages can enjoy entertaining science shows and demonstrations.

The centre's wide range of on-site and off-site programmes help to raise the scientific and technological awareness, literacy and engagement of the general population, and encourage more young people to pursue studies and careers in science and technology. Exhibits and activities use non-traditional educational approaches designed to make scientific concepts more easily understood and captivating to both children and adults, and to show their relevance and application in everyday life. Many programmes are also directly targeted at developing the creative and innovative capacity of our citizens.

NSC visitors

For FY 2014, 15,253 persons visited the centre, for general and themed science visits, including Astronomy Nights.

Categories of visitor admissions:
Adults with groups (free) - 817
Children 5-17 - 8,233
Children under 5 - 2,209
Adults 18 yrs and over - 3,040
Waived admission (children) - 954

Visitor feedback
A survey of 265 visitors (approximately 2% of total visitors) conducted during the period showed that:

- 99% of respondents found their experience enjoyable;
- 95% found the educational value of the exhibits to be above average (i.e. good or excellent), with the majority leaning towards excellent; and
- 53% had visited the centre before. This large pool of repeat visitors strongly demonstrates the institute's success in continually engaging visitors in the activities of the centre, as well as advancing the levels of scientific and technological literacy in the visiting population.

The National Science Centre continues to develop its resources in science and technology for the education and enjoyment of visitors of all ages, and especially creating fresh and exhilarating learning experiences for the younger age groups. In addition, the centre's reach and impact on communities beyond its location are increasing as more and more public and private agencies are requesting NIHERST's participation in the events they host for the public.

Following are reports on the achievements of specific or flagship programmes and main/ongoing activities.

1.2.1 Sci-TechKnoFest 2013

NIHERST's large-scale, biennial science and technology festival, Sci-TechKnoFest (STKF), was held at the Centre of Excellence in Macoya over the period 1-20 October 2013 and attracted approximately 55,000 visitors. STKF is a key platform for fostering citizen awareness and literacy around STI and reducing the barriers to knowledge and understanding. NIHERST showcases cutting-edge concepts in science, technology and innovation in a rich variety of exhibits and activities to appeal to and engage citizens of all ages. Previous festival themes explored science and technology in daily life, connectivity, energy, the environment, health and wellness, and creativity, innovation and sustainability.

The 2013 festival theme was "Celebrating Human Ingenuity", which focused on the story of our collective experience as human beings with the innate creative capacity to invent and innovate, which has defined and advanced civilisations throughout history and is today the key driver of the global economy. Like all previous festivals, the 2013 festival brought to life cutting-edge science, innovation and technological concepts in engaging ways that appealed to lay citizens of all ages. It consisted of: a visiting international exhibition, "101 Inventions that Changed the World"; in-house exhibits from the National Science Centre; new exhibits and activities created specially for the festival; external exhibits by over 30 public, private and civil society agencies showing the application of STI in their operations; a science theatre; and specially themed exhibit areas catering to specific age groups (early childhood, primary and secondary school levels).

More than 43 secondary and tertiary school students were trained as science explainers, which served to broaden their knowledge and their appreciation of the importance of science to society, and orient them towards further studies and careers in science and technology.

Exhibits

"101 Inventions That Changed the World"

This was a new travelling exhibit created by the Australian-based firm, Grande Exhibitions, and was the main attraction of STKF 2013. "Larger than life-size", the exhibit provided a high tech, multisensory and hands-on experience. Its showing in Trinidad and Tobago was the second venue on its world tour, immediately following its inaugural staging in the US. Both children and adults were transported through time as they saw, through immersive theatre, live artefacts and interactive touch screen devices, the 101 inventions that played a significant role in human and social development.

The exhibit consisted of three sub areas:

- The Immersive Gallery–A large walk-through theatre, in which the 101 inventions that changed the world were highlighted through the use of projected photography, video, animation, music, sound and written words.

- Real Artefacts - Sixty (60) genuine, historical exhibits were displayed and their creation and use was explained using touch screen displays.

- Inventors Den - Educational activities were conducted such as map making, microscope viewings, papermaking and hands-on activities on electricity, lasers, string telephones and much more.

In addition to bringing the excitement of international exhibits to the festival, NIHERST also had an impressive offering of the exhibits from the National Science Centre, many of which were either developed completely in-house or in partnership with external agencies, and on show in themed exhibit areas. They offered the public a closer look at concepts in the following fields:
Eureka: Brain Development, Health and Wellness, Road Safety, Music, Nanotechnology, Mathematic kits, Renewable and Non-Renewable Energy, and Natural Disasters.
Science vs. Spy: The science behind motion detection, lasers, and researcher-developed tools that utilize the concept of bio mimicry (researcher-developed tools useful to man which mimic behavior in nature).

Robomania: The varying functionality of robotics was showcased. Visitors got to explore the concept of the application of robotic units to make everyday life easier, such as robotic vacuum cleaners and the use of tactical robots in situations that may be dangerous for humans to navigate. The application of robotics in the manufacturing industry was also showcased, as well as the how these types of robots are programmed.

Sustainable Dance Club: Visitors, both young and old, generated enough energy to power their very own dance club. In this system, when the plates on the floor were moved, kinetic energy was transformed into electrical energy, to power lights at varying degrees, impacting on the brightness

and intensity of the illustrations on the walls. When enough energy was produced, a disco ball on the ceiling of the dance club was activated.

TechKno Theatre: This is where science met theatre/entertainment. Top international and local artistes brought fun and laughter to learning with public lectures, science shows and performances for all ages. The theatre was packed during peak hours (over 600 visitors).

Virtual World: This exhibit area explained and applied the technologies used in two-way mirrors, multi-touch screens, transparent projection film and the Xbox Kinect. Visitors left intrigued about the possibilities of existing technologies.

Planetarium: Designed to depict an actual view of the sky, this area contained an inflatable dome equipped with a digital projector. Visitors were given a guided tour of the October night sky and navigated the vast field of stars through introduction to various easily identified constellations.

Other festival areas included: a Creative Design Laboratory, flight simulators, and an Immersive Story Telling area exclusively for the early childhood and primary school age groups.

Partner Exhibitors

NIHERST has forged strong partnerships with public and private sector entities that help advance the institute's mission to popularise science, and interest students especially in the pursuit of scientific careers, by showing in their exhibits the application and relevance of STI in the real world. Over the years, our festival partners have modified their offerings to match NIHERST's interactive, visitor-friendly approach to education. Many now incorporate computer simulation and multi–touch technology, thus engaging visitors with their content in more meaningful ways. Partner exhibitors showcase careers that require students to study STEM (science, technology, engineering and mathematics) fields at the high school and tertiary education levels. Over 30 public, private and civil society entities supported STKF 2013. (See list below, Section 7 c.)

Audience

For each festival, NIHERST conducts surveys of a random sampling of visitors, not only to gauge the visitor's level of satisfaction with the event, but also to capture the knowledge gained by the visitor from having attended. Past festival surveys consistently show that all segments of the public attend the festival, from the early childhood level to senior citizens; and that both the festival and

the National Science Centre itself appeal to a wide range of persons from students, teachers, legislators, senior officials and retirees.

Using structured, pre-coded questionnaires, during the 2013 festival, data was gathered from a visitor sample size of 4,044 persons, 73 per cent of them being students. The feedback shows that school-aged children from 10- 14 years old accounted for 48% of the total visitorship. The data collected indicated that 34 per cent of the survey respondents were repeat visitors from over the years. Approximately two-fifths (41%) of the survey respondents indicated that they had visited the NIHERST/NGC National Science Centre (NSC) in the past. Eighty-eight percent (88%) of them found this particular exhibition to have surpassed the others in terms of the size of venue, interest level and engagement factor of the exhibits. Approximately 97 per cent of those surveyed had an enjoyable learning experience, listing the following areas as being most educational: Eureka, Science vs. Spy, and Robomania.

Ninety (90) per cent of respondents indicated that the festival increased their knowledge about science and technology overall. The offering of interactive exhibits proved to offer the public a rendering of scientific concepts that were easily digestible to all palettes as 98 per cent of visitors reported that the STEM content was comprehensible. Over three-quarters (78 per cent) of the visitors stated that the festival ignited their own creativity, as they felt encouraged to be more creative and innovative in their daily lives. While every person's experience of the festival was different, it definitely left an indelible impression on the minds of the attendees, leaving comments such as:

- Had interest in conducting experiments and practicing what was taught.
- Were encouraged to pursue a career in STE.
- Wanted to research more and learn more about science and technology topics.

The following samples of quotes from visitors, gathered over the three weeks via the NIHERST surveys and social media feedback, also showed the positive impact and great popularity of STKF 2013 on a diverse cross-section of the public:

- "Extremely pleased, the children are highly impressed..." - Proprietor, Chaguanas
- "It could never get better..... amazingly educational." - Student, 10-14 years, San Fernando
- "Awesome… You all really went all out this year." - A. Mohammed Ali
- "Had lots of fun at the fest 2day!!!! Loved the skits in the theatre!!!!" - V. Young
- "Although our students were excited to attend, we still never imagined we would see so many interesting things on display. This event really brought the science we teach them to life." - A teacher accompanying students from Santa Flora
- "It is a must-see for everybody! I was very impressed with the professionalism of the NIHERST staff... and especially how they shepherded multitudes of school children.. and answered questions, offered help …. My favourite exhibit was "101 Inventions that Changed the World." - Anonymous visitor

Wow! Could have spent hours in there. Now that NIHERST has been fully activated in my consciousness, I will be paying close attention to and participating in all activities. You are doing great work!" - Anonymous visitor

1.2.2 Caribbean Youth Science Forum (CYSF)

The annual week-long Caribbean Youth Science Forum (CYSF) is the leading and longest standing non-formal STEM education programme for nurturing the next generation of scientists and engineers in the region. It is held in the first week in August and targets lower sixth form science students.

The forum serves as a unique and enriching platform for inspiring and mentoring young people towards advanced studies and careers in STI. It aims to broaden their knowledge; develop their creative thinking and problem-solving skills; foster in them a sense of pride in the region's scientific heritage; and awaken their minds to the potential and possibilities that lie before them through careers in science and technology. Students benefit from a first-rate science education experience which provides the right mix of academic, social and cultural activities for their holistic development, and heightens their sense of identity as the region's future leaders in STI.

The core educational components of CYSF are:

- presentations by, and engagement with, leading local and international speakers for knowledge on new and emerging technologies that are impacting global development, as well as mentoring and career guidance;
- field trips to research institutions and S&T-based companies where students can see "science in action" and potential career paths; and
- group challenges that push students to apply their scientific know-how, and develop their creativity, innovative and problem-solving skills, and ability to work in teams.

In 2014, the forum received 157 students with 32 from Antigua, Barbados, Grenada, St Lucia and Jamaica, and the rest from 29 schools in Trinidad and Tobago.

During the week, students explored, through lectures/presentations and workshops, issues in fields such as tissue engineering/artificial hearts, neuroscience and brain machine interface technology, tropical meteorology, forensic science, and renewable energy and energy resource efficiency.

This year's distinguished visiting keynote speaker was Prof. Miguel Nicolelis, Professor in Neuroscience at the Duke School of Medicine, Professor in the Department of Neurobiology, Biomedical Engineering, Psychology and Neuroscience and Co-Director of the Duke Center for Neuroengineering. Prof. Nicolelis is a pioneering neuroscientist, and a specialist and world leader in neuroprosthetics. His latest research work was critical to the development of the robotic exoskeleton which was debuted at the kick-off of the 2014 FIFA World Cup in Brazil. His very

inspiring keynote address at the opening ceremony was followed the next day by an equally riveting technical presentation, also opened to the public, on his groundbreaking work and revolutionary insights into how the brain creates thought and the human sense of self. His talk outlined the science behind the technology he has developed for capturing brain function, which is paving the way for a new treatment for Parkinson's disease and new ways of treating paralysis. His participation was sponsored by the US Embassy in Port-of-Spain.

Another presentation, to which the public was also invited, was delivered by Trinidad-born and US-based scientist, Dr. Ravi Birla, Associate Professor at the University of Houston and Director of the Artificial Heart Laboratory, in the Department of Biomedical Engineering, Cullen College of Engineering. It focussed on his own research on the development of an artificial heart.

The participants also enjoyed field trips to 14 institutions to experience the application of STI in the real world, in business and industry. The Socialising with Scientists evening gave the students the opportunity to have short one-on-one discussions with 28 top professionals in range of STI-related fields.

The Design Challenge required teams to problem solve and innovate under a set disaster/emergency scenario with a sustained loss of electricity. They were asked to create a way to preserve food for several days without the use of chemicals, or a fixed line external power source. Their device(s) had to be able to preserve milk and homemade bread and a mystery item (tomato slices). The Science Seekers outdoor activity for "survival in the wild" provided knowledge and guidance on: jungle hygiene, insect stings and snake bites, useful jungle plants, shelter construction, procuring water and food, and building fires.

1.2.3 Community Science Weeks

Started in 2003, this pioneering outreach initiative, designed to increase the scientific awareness and literacy of all citizens, has benefitted over 61,000 children and adults from 17 communities across Trinidad and Tobago. A core part of NIHERST's science popularisation programme, literally "taking science to the people", science weeks are structured to make knowledge of, and developments in, science and technology more accessible to people in rural areas and communities that are underserved by the National Science Centre. Through stimulating experimentation, demonstrations, workshops and exhibits that aid both teaching and learning, educators and students are able to better grasp scientific concepts, processes and issues, and understand their full impact on society and development. Every science week is "owned" by the particular community - tailored to meet its unique needs and demands. The events are embraced enthusiastically by educators and leaders in the communities. There is a large degree of involvement by community stakeholders in planning the content and execution to ensure the exhibits and activities cover topics and areas of maximum relevance and appeal to community members and the local economies. Residents from surrounding communities also attend the science weeks.

In 2014, NIHERST hosted the following Community Science Weeks, attracting a total of 9333 school children and residents:

- Fyzabad Community Science Week held at Fyzabad Secondary School: 3-8 February, attracting over 5000 visitors, including 4450 students and teachers from 21 primary schools and six secondary schools in this district.
- Gasparillo Community Science Week held at Gasparillo Secondary School: 28 April – 3 May, with over 4800 visitors, including 3773 students and teachers from 13 primary schools, three ECCE schools and five secondary schools.

The events, enabling visitors to explore science and technology in new and inspiring ways, featured interactive exhibit areas, workshops, science shows, cultural performances, media library activities, an astronomy night for viewings of the night sky through high-powered telescopes, and a career day. Some of the topics covered included: healthy life styles, road safety, electricity and magnetism, astronomy, momentum, kinetic and potential energy, forensic science and robotics.

There were fun-filled, interactive areas for specific age groups such as the Think Tank area, designed for ages 8 to 11, which focused on pollution, fossil fuels and the greenhouse effect. The Brain Rush area, for ages 8 and up, included exhibits and interactive games encouraging brain development and enhancing problem-solving skills. The Virtual World area all age groups showcased ICT in education. Workshops were conducted on operational amplifiers for sixth formers and experimentation skills for third formers.

The student workshops conducted were:
Experimentation skills for form 3
Global warming for form 3
Remedial mathematics for form1
The science of clothing and textiles for form 4
Hydroponics for form 4
Graphic design for form 4.

Feedback from visitor evaluation surveys for these science weeks showed they were very well received by the community, with visitors of all ages expressing full satisfaction with the content and materials presented.

1.2.4 Robotics

Although creativity and innovation underpin all the work programmes of NIHERST, given its national importance to people-centred development, the institute pays special attention to this through its Robomania (robotics) and Creative Design Labs (CDL). Robotics, including

automation and artificial intelligence, is one of the cornerstones of technological advancement and innovation globally and is an area of that needs to be fostered as Trinidad and Tobago builds its S&T capacity.

Consistent with the approach taken by the NSC, the labs deliver a wide range of very popular activities at vacation camps, workshops, road shows, Community Science Weeks, outreach activities and themed visits, to develop a creative and innovative mindset amongst nationals. This exposes students of all ages to the application of the technology beyond their classroom work, including technology not yet taught within the formal school system.

The robotics activities provide students with the real life application of the programing and IT skills that they would have learned in theory in the classroom setting. Students can see the transition from theory to practice as they use algorithms to program a robot's tasks. Critical thinking skills are honed as persons must think logically as they arrange the robot's tasks in sequential steps. Visitors also get to see robots and robotic applications that allow humans to perform tasks more efficiently or ones that may otherwise too dangerous. Some of these include robotic arms, bomb disposal robots and robotic vacuum cleaners.

For the period January to April 2014, CDL conducted 19 electronics and robotics workshops reaching over 1,300 students in South Trinidad. The 1-day electronics workshops covered topics such as the physics of the atom, electricity and electronics, and power generation and distribution. Students also built pencil light bulbs and flasher circuits as part of the electronics project. The one-day robotics workshops focused on introductory robotics, with students building their own robots using Lego Mindstorm EV3 robotics kits, and learning how to program them.

CDL/Robomania also facilitated demos/workshops at the following events:

- Fyzabad Science Week
- Gasparillo Science Week
- Launch of STAR.TT facility- Penal Community Center
- Barrackpore East Secondary Career Fair
- Virtual Education Symposium- Hyatt Regency
- Women in ICT
- Seniors in ICT
- Tobago Science Expo
- St. Stephen's Career Fair.

Towards the Launch of a Fab Lab

CDL has been a pioneer in public education and training in innovation and invention, 'technopreneurship' (innovation-driven entrepreneurship) and the use of rapid prototyping technologies. Having experienced the growing demand for training and access to these technologies, NIHERST hopes to create a new platform for innovation and invention. Steps were taken to 2014 to transition the Creative Design Lab from its current state into a proper Fab Lab under the Global Network of Fab Labs curated by the Fab Foundation at MIT's Centre for Bits and Atoms. As of September 2014, repairs and renovations to the lab were identified. These renovations are critical to converting the lab into a Fab Lab.

1.2.5 Vacation camps in Science, Technology, Innovation and Invention

NIHERST offers an expanding range of camps during the July/August vacation period targeting young people between the ages of 5 and 17 to continue and broaden their science learning outside of school with high quality, hands-on experiences of science and cutting-edge technologies. The camps' explore the disciplines of ICT, science, engineering and math, with four distinct themes cutting across the diverse offerings: science, technology, creativity and innovation, and engineering. Portions of the content are geared towards deepening students' understanding of topics in the school science curricula, while other parts focus on providing children with science content that they would not normally encounter in the classroom. The science camps focus on scientific principles and concepts, while the other camps expose children to the applications of science and the basics of the innovation process and entrepreneurship ("technopreneurship"). Some camps also blend science with the arts to provide a holistic experience and fully engage the participants.

The camps are designed to satisfy the interests of all age groups, with emphasis placed on boosting creative thinking and problem solving using science and technology. They have been oversubscribed in recent years, with parents requesting longer sessions, so the number and duration of camps have been expanded. In FY 2014, a total of 1134 children took part in the following highly interactive camps, double the number in 2013.

The two-week long **Funology** and **Explorer** camps cater to children and teens in the age categories 5-7 years and 8-12 years respectively. Both camps are run simultaneously on the same dates and at the same locations across Trinidad, viz. Port of Spain, Preysal and San Fernando.

Venues	Dates	Funology Camp Attendance			Topics
		Males	**Females**	**Total**	
UTT John S. Donaldson Campus	7 – 18 July	35	22	**57**	• Solar System • Astronomy • Space • Gravity • Rockets • Telescopes • Wacky Science
Preysal Secondary School	21– 31 July	16	12	**28**	
UTT San Fernando Campus	11–22 August	40	22	**62** **147** ====	

Venues	Dates	Explorer Camp Attendance			Topics
		Males	**Females**	**Total**	• Aerodynamics • Civil Engineering • Electricity • Robotics • Optics • Mechanical Engineering • Chemical Engineering • Wacky Science
UTT John S. Donaldson Campus	7 – 18 July	40	22	**62**	
Preysal Secondary School	21 – 31 July	11	16	**27**	
UTT San Fernando Campus	11 – 22 August	39	33	**72** **161** ====	

The **Young Inventors** and **Robomania** camps are three weeks long and target teenagers (13-17 years). They are held at the National Science Centre as well as the UTT San Fernando Campus and Debe High School. The Robomania camps covered: an introduction to EV3 programming; frequency and amplitude (obstacles detection); introduction to sensors; gears and speed; and precision turns. Participants in Young Inventors learned about aerodynamics, Auto Cad,

civil and mechanical engineering, electronics, renewable energy and technopreneurship. The projects undertaken by campers were:

- Week 1: Build Challenge - Obstacle Course (Lego Mindstorms EV3 Kits
- Week 2: Programming Challenge - Multi Colour Line follower (Lego EV3 Kits)
- Week 3: Remote Control Challenge - Battle Bots (VEX Robotics kits).

Camp Venue	**Dates**	**Male**	**Female**	**Total**
Robomania (NSC)	7 – 25 July	25	7	32
Young Inventors (NSC)	4 - 22 August	19	14	33
Robomania (UTT)	7 – 25 July	24	8	32
Young Inventors (Debe)	4 – 22 August	17	13	30
Total		**85**	**42**	**127**

The computer-based **Tech Camps**, of varying lengths, have something for each age group, Juniors (ages 7-9 and 9-12) and Seniors (ages 13 -17). The camps were run back-to-back at the National Science Centre over the July - August period, with one camp (GrafX) being held at both NSC and UTT San Fernando.

Juniors were taught: Scratch (visual programming software) basic level, which enabled them to create and share their own animated stories and interactive games while reinforcing important mathematical and computational ideas; Makey Makey and Lego WeDo kits allowing students to explore programming physical objects in the real world (as opposed to virtual programming using Scratch alone); Kodu - a drag and drop junior game design software. The seniors worked with Adobe Illustrator and Photoshop to create and edit graphics for websites and flyers; Android App Development to create a simple mobile app; and Unity Game Engine to learn the fundamentals of 3D game development and game logic as well as to create one level of a multi-level video game. They also used Dot.Com to learn HTML and CSS to be able to code to create their own websites.

Camp	Dates	Camp Attendance
e-Magination L1- NSC	7 – 11 July	
e-Magination L1 - NSC	21 – 25 July	45 (total L1)
e-Magination L2 NSC	14 – 18 July	
e-Magination L2 NSC	28 – 31 July	48 (total L2)
Kodu Nation	4 – 8 August	41
GrafX (NSC and UTT San Fernando)	21 – 31 July 4 – 15 August	43
Dot Com NSC	14 -18 July	21
App Builders NSC	11 – 15 August	20
Gamerz World NSC	18 -29 August	18
		236

NIHERST's Sci-Spy and Eureka camps offer participants a wide range of hands-on, minds-on experiences in various science fields. The Sci-Spy camps are geared towards using exploratory strategies and techniques to introduce campers to topics that they would not normally encounter in their school setting. The Eureka camps are more advanced and offer campers a deeper level of engagement with the content.

In the 2014 camps, children got to understand, for example, the scientific method and the work of scientists in different branches of science; undertake crime scene investigation; look at the science and/or technology behind natural and man-made wonders such as the Pitch Lake, the Grand Canyon and the Great Barrier Reef, Stonehenge, Machu Picchu and the pyramids of Egypt; and examine the science facts and fiction behind the superpowers of popular X-Men characters. Enrolment in these camps increased from 2013, with Eureka doubling in number.

Camp Name	Age Group	Venue	Date	Topics	Total
Sci-Spy: Three camp cycles, each two weeks long	7-9	NSC	7 July to 22 August	Sport Science Pirates of the Caribbean (mapping and shipping) Superhero Science Up, Up and Away (flight science) Feel the Beat (science in music) Wonders of the World (iconic natural and man-made wonders) Money Math Private Investigator (forensic science)	182
Eureka: Six camp cycles of one-week duration	10-12			Planet Earth Science Dramatics Discover the Universe Being a Scientist Examining the Evidence Trinigold (the science of T&T's economic resources)	200

The Tobago Science Camp 2014 was held from 7 - 18 July at the Mason Hall Government Primary School. A total of 62 children between ages 5 to 13 (39 boys and 23 girls) were enrolled. The camp was staffed by six camp counsellors from NIHERST and two persons brought by the THA.

The camp covered the following six topics:

1. **Animals Attack** - animal physiology, defence mechanisms and biodiversity
2. **Science vs Magic** - chemistry and optical illusions
3. **Body Basics** - human anatomy and physiology, health and diseases, nutrition and healthy lifestyles
4. **Dinosauria** - paleontology, dinosaurs, archaeology and geography.
5. **Surviving the Wild** - environmental science, atmospheric science, innovation and basic survival skills.
6. **Rides, Slides and Coasters -** basic principles of physics as explored through amusement park rides.

The camp was very well received, with parents requesting more camps in more schools and children wanted longer camps.

1.2.6 Clubs

The various clubs run by the NSC provide opportunities for students (ages 7 - 16) to expand and deepen their knowledge of scientific concepts as applied to daily life, reinforce concepts taught in the primary and secondary school science curricula, and foster life-long science learning. All clubs meet twice a month.

- *Science Club*: Science Club is open to Juniors (ages 7-9) and Seniors (ages 10-16). It helps to foster a positive attitude in students towards science. The club utilises several methods of teaching including hands-on activities, use of technology, and audio-visual aids to meet the needs of its membership with various learning styles and abilities. Science Club also provides academic support to the students with respect to problematic science topics they encounter in the classroom.

  As at end of the reporting period, the club had a total of 80 members. Meetings engaged members in a variety of interactive activities on topics such as: animal adaptation, locomotion, respiratory systems, diet and habitat, seeds, plants and maintenance and building of a hydroponics system. All of these align with the "Living Things" strand in the new primary school curriculum. The lesson objectives and pedagogical strategies were adapted to suit the developmental and learning needs of the various age groups.

- *Sci-Eng Club*: In 2014, this club had a membership of 35 students. Topics covered included: advanced machines, civil engineering, fantastic forces and static electricity.

- *Robomania Club***:** In 2014**,** the 18 club members worked on various projects, including an EV3 football player. They were also introduced to the Cubelets and Phantom DJI Drone systems.

1.2.7 Astronomy Nights

At Astronomy Nights, held during the dry season, young visitors were enjoyed the Astrozone area, with activities that combined innovation, science, technology, engineering and mathematics, intended to promote public understanding of what is out in space. Visitors also have the opportunity to peer through NIHERST's new Celestron telescopes to observe the night sky. Also on offer are a variety of workshops and games which provide lots of 'edutainment' for families. Astronomy Nights were held at NSC on 21 February (182 visitors); 11 April (618 visitors) and 23 May (555 visitors). In addition, astronomy viewings were held at the two Community Science Weeks and attracted 460 visitors.

1.2.8 Community-Centered Design and Innovation (COMDESI)

Based on the EPIC programme of leading US universities (notably Purdue University), the COMDESI project provides students in forms 2-4 students with an educational experience in working with communities to devise viable solutions to real world problems. The project is administered by NIHERST's Innovation Department in collaboration with the Heroes Foundation, which runs a Youth Development Programme in secondary schools. COMDESI participants develop the skills for community engagement, communication, research, problem-solving, critical thinking and reflection, along with report writing and presentation skills. They learn the rudiments of the process of innovation and how to move from a creative idea to a prototype, and receive basic training in AutoCAD, prototyping, intellectual property, project management, and "technopreneurship", which fosters innovative and entrepreneurial thinking and skills using science and technology.

The project develops in students the aptitude for finding solutions to community needs and problems, by applying the knowledge and skills learnt in the classroom, and through the hands-on experience of problem-solving, design and innovation that the programme provides. This contributes to the more rounded development of the students, helping to prepare them for the world of work, and fostering leadership skills and a culture of civic engagement and volunteerism in the next generation.

At its core is a well-structured nine-month training programme that students attend on Saturdays and during the Easter vacation. They also meet with representatives from the targeted communities

to better understand their specific issues and needs, and then use the August vacation to work on their solutions and prototypes.

On 30 November 2013, NIHERST's held an awards ceremony at Hotel Normandie for the 49 participants of the 2013 COMDESI programme. The projects/solutions submitted were judged and all students received a participation prize. Three additional group prizes were awarded for the Most Innovative Design, Best Prototype and Leading Team in Community Engagement.

At the ceremony, most students attested to the value of COMDESI, stating that the experience had been unforgettable, the technical and life skills they had developed would help them throughout their lives, and they felt inspired and encouraged to continue being of service to others.

In March, 53 students from seven secondary schools - Bishop's Centenary College, Bishop Anstey High School East, St. Augustine Girls' High School, San Fernando Central High School, Malabar Secondary School, St. George's College and Arima Central Secondary School – signed up for the 2014 programme.

Following weekly training and mentoring sessions with the NIHERST staff on civic and community engagement, teamwork and leadership, the students attended a two-week camp, also facilitated by NIHERST staff, during the Easter vacation and received training in creativity, innovation, the design process, ideation, technopreneurship, prototyping, SolidWorks and technical drawing.

Working in teams, the participants were given three challenges to choose from and were required to create a solution for one of the challenges. For a better understanding of the specific issues and needs required to solve the challenge, students identified a target community group, based on the challenge, and interacted with persons from those communities throughout the course of the programme. They then crafted and built their innovative ideas on weekdays and Saturdays during the school term. Their solutions, which were nearing completion, included: a collapsible rain cover and storage compartment for wheelchairs as well as an emergency water purification system that combined solar still and bio-sand filtration techniques. Other teams had other innovative ideas but the demand of schooling and other commitments did not permit them completing their solutions. The judging and awards ceremony was scheduled to take place at the end of October 2014.

1.2.8 External outreach events

NIHERST also makes an impact on the national community by taking part in events hosted by valued partners and the outreach activities of external agencies engaging in the promotion of STEM education; highlighting specific socio-economic issues relevant to the national community, or hosting celebrations related to their areas of interest, causes or particular communities. The institute's pioneering efforts to popularise science over the decades has been a catalysing force for

such public and private organisations in improving their own public outreach approach or methodologies, and increased demand for the institution to take part in external events shows growing public appreciation for science educational content.

Following are the events NIHERST participated in during FY 2014 budget year:

Name	**Date**	**Area**	**Goals**	**Number of students/participants**
The STEM Children's Conference	16 and 17 January	UWI St Augustine	To promote STEM education to young people	1000
Brazil Secondary High School	23 April	Brazil	To improve awareness of STI within the community	550
San Juan Government Secondary	20 March	San Juan	To improve the knowledge that students have on healthy lifestyles	750
ICT for Girls ICT Conference Virtual Education Symposium Hyatt Regency	8 April 1-3 April 19-20 May	Port of Spain Port of Spain Port of Spain	To improve ICT literacy in the community To educate on developments in education using ICT	2000
South West Regional Health Facility		San Fernando	To improve awareness in the community on the dangers of smoking and the risk of cancer	1000
SDA Health Fair	8 April	San Fernando	To improve the knowledge that students have on healthy lifestyles	400-500
BG World Day	3 June	Port of Spain	To enhance workers' knowledge on alternative sources of energy	100
Digicel Career Day	5 July	Port of Spain	To link brain function to career choices	600

Name	Date	Area	Goals	Number of students/participants
St Stephen's College Career Day	19 Sept	Ste Madeleine	To link brain function to career choices	650
The East Port of Spain Community ARTS Festival	27 Sept	Morvant	To link brain function to career choices	600
Tobago Science Expo	26 Sept – 2 Oct	Signal Hill	To improve scientific literacy in the community	1000
Innovation Village of the Americas Competitiveness Forum	9 – 11 Oct	Port of Spain	To showcase innovation in development	1500
Lakshmi Girls' School Science Fair	15 Oct	St Augustine	To provide an engaging experience as students improve their understanding of science concepts	400

1.3 National awards and competitions

1.3.1 Awards for Excellence in Science and Technology

This NIHERST awards scheme honours nationals working both locally and abroad for their outstanding achievements in STI. Staged in collaboration with the Caribbean Academy of Sciences (CAS), awards are given to persons distinguished in the fields of engineering, natural sciences, medical sciences, applied science and technology, and technological innovation in arts and culture. There are also award categories for Junior Scientist and Junior Engineer aimed at persons under the age of 35 with exceptional abilities and achievements.

The scheme also enables the institute to document, through an ongoing series of publications, the accomplishments of these often unknown and unsung scientists, raising their visibility within the wider community, and presenting them as positive role models for our youth, and aspiring scientists in particular. This is indispensable in developing a culture that values the contribution and legacy of its scientists. The publications are distributed to schools, libraries and diplomatic missions. They are often the only detailed biographical material available on the scientists featured.

In November 2013, NIHERST hosted its Awards for Excellence in Science and Technology at the Hyatt Regency Trinidad. The following 18 awardees were honoured:

Gold
Professor Dave Chadee
Professor Richard Dawe
Dr. Roger Pulwarty
Professor Haroun Shah

Silver
Dr. Ravi Birla
Mr. Willi Chen
Dr. Myron Chin
Professor Stephan Gift
Dr. Shirin Haque
Dr. Rohanie Maharaj
Professor Philip Phillips
Mr. Jimi Phillips
Professor Lexley Pinto Pereira
Professor Terence Seemungal

Junior Scientist/Engineer
Mr. Jahson Alemu
Dr. Yaisa Andrews- Zwilling
Dr. Rajini Haraksingh
Ms. Savitree Singh

NIHERST took the opportunity to have two of the scientists, Professor Philip Phillips and Professor Haroun Shah, both based abroad, to each deliver a public lecture at The University of the West Indies. Professor Phillips' presentation on 26 November was entitled "Are High Temperature Superconductors full of Unparticles?" and Professor Shah's on the 27 November was on "Harnessing the power of nano technologies to diagnose human infectious disease on a global scale".

The publication featuring the biographies of the 17 awardees from the 2012 Awards for Excellence in Science and Technology, *Trinidad and Tobago Icons in Science and Technology Vol. 3*, was completed in 2013 and formally launched in March 2014.

The Call for Nominations of the 2014/2015 instalment of the Awards for Excellence in Science and Technology was advertised during the period May- July 2014 through traditional and social media, and promoted through local academic and research institutions and other scientific agencies and academies including CAS. A total of 28 nominations was received. Judging was undertaken by an international panel of five experts and was expected to finalised by November 2014.

1.3.2 Prime Minister's Awards for Scientific Ingenuity

The Prime Minister's Awards for Scientific Ingenuity are offered biennially on the basis of two competitions: the Scientific Creative Solutions Competition and the Scientific Innovation & Invention Competition.

In FY 2013, Stages I and II of the judging of the 254 entries received for 2013 awards took place, with 57 entries making to the final stage of selecting the top winners in each award category. The awards ceremony was held on 4 January, 2014 in the Port-of-Spain Ballroom of the HYATT Regency Hotel & Conference Centre. The top three places in all four categories were as follows:

Scientific Innovation & Invention Competition

Senior Category

1st Place Richard Patrick Clarke - Sustainable Hurricane and Earthquake Resistant house

2nd Place Maurice Peter Vidale - Mounted reciprocal Trailing Tracking Guide for portable powered machine tools

3rd Place John Simon - Machine for Cutting of Masonry Wood and Other Materials

Junior Category

1st Place Esther Crystal Njonge - Eco-light

2nd Place Kesheanne Francis, Giatri Kavita Lalla, Alissa Sophia Adams, Aleema Persad – Can-o- The Crusher

3rd Place Nishala Rampersad - Coconut Opener

Scientific Creative Solutions Competition Results

Senior Category

1st Place Dominic Gordon, Ruel Elis - Mobile Osh Inspection App

2nd Place Natasha Ramroop Singh - BioCatalyst for the Removal of Green House Gases

3rd Place Chade Gabriel - Drinking Straw Holder

Junior Category

1st Place Deemarie Gordon - Safe Oil & Water Paint Remover

2nd Place Brittany Cochrane - Music CD Learning Tool for CXC Students

3rd Place Makida Alexander - Smartphone Application for finding lost Keys

The total prize money of TT$1,250,000 was distributed amongst all 57 finalists, with the largest portions going to the top three in the senior categories.

Coming out of this competition, it should be noted vis-a-vis the quality of the winning entries, that:

- Feedback from judges was used by entrants and winners to tweak their inventions as well as assist in patent applications

- 2 winners secured US patents with one seeking protection in the UK
- 1 winner filed at the local Patent Office in November 2013
- 1 winner's patent is pending in the USPO (United States Patent Office).

Additionally, an invitation was sent out to all finalists to be part of the local contingent at the 2014 Innovation and New Product Expo [INPEX]. INPEX was held in Pittsburgh, Pennsylvania, United States between 18 and 20 June. Four entrants who took part received awards. One entrant caught the eye of tool manufacturer, Black & Decker, and this inventor entered into negations with the company for a possible licensing deal.

1.3.3 Science Music Video Competition

The NIHERST Science Music Video Competition was launched in June 2012. Unlike the educational material produced in-house by NIHERST for the public, this competition challenges youths between the ages of 14 and 28 to create music videos of their own that show the central role of STI in development. Drawing on the popularity of user-generated content and the rise of viral videos in social media, tapping the power of the creative arts, and enlisting young people as the messengers, the music videos serve as an unconventional and exciting way to build awareness of STI as major forces for diversifying the national economy, increasing global competitiveness, and providing solutions to pressing national problems.

The project's objectives are to:

- improve the communication of STI issues to the general public and youth in particular;
- engage non-traditional audiences in STI issues;
- utilise ICTs towards improving the learning environment for science, technology and innovation;
- discover and support youth in creative modalities of promoting visibility of the importance of STI to improving national development; and
- increase media interest in, and coverage of, science and technology issues and more specifically their relevance to development in the Caribbean.

The winning science music video pieces play a role in information exchange, awareness building and improving understanding of science and technology. It is also considered to be an important part of the wider mission to foster a national culture of science, technology and innovation. Nurturing and recognising the creativity of our country's youth is also essential to spur economic diversification. The intention is for the resulting productions to be promoted on social media platforms and also played at NIHERST events to communicate scientific information in an attractive and appealing way, and engage a broad range of viewers, and above all, our youth. The competition has succeeded in capturing the attention and imagination of the targeted generation as they accepted the invitation to become "ambassadors" for science and technology.

Participants employed the knowledge, insights and tools made available to them during a 3-day training workshop in May 2014, to produce an array of entertaining videos with strong potential to increase public interest in and understanding of the issues covered, and their impact on human life and development. Course content included: an introduction to music video production with a view to imparting practical and working knowledge of pre-production and post-production techniques applied to the making of a music video; an introduction to non-linear editing with fully interactive hands-on sessions; and finally an introduction to desktop music production designed to introduce students to basic music production.

Participants were paired with a mentor, highly knowledgeable in the respective topic areas. Six weeks of scientific mentorship was provided, during which draft scripts were critiqued to assist participants in achieving stronger scientific messages in their music videos. The mentorship encouraged research; the use of factual information as opposed to opinions or hearsay; finding a focal point and a channel of direction for the topic chosen; and making science fun and understandable.

Over 80 individuals and teams from across Trinidad and Tobago submitted a total of 21 "edutaining" videos which focussed on important development issues such as: climate change, renewable energy, water security and rainwater harvesting, family farming and small island developing states. The music videos reflected a range of genres from hip-hop to spoken word to dancehall. A panel of professionals assessed the videos in accordance with the guidelines and criteria set, namely: scientific merit, originality/creativity, potential public impact and presentation. Heavy weighting was placed on scientific merit.

At the Awards Ceremony on 11 October, 2014 the winners were announced. Five special prizes were also awarded for noteworthy videos. These prizes of $5,000 each have been sponsored by the Environmental Management Agency (EMA), Ministry of Energy and Energy Affairs (MEEA), The Trinidad and Tobago Electricity Commission (T&TEC) and the Ministry of Food Production.

The videos have been aired on YouTube, bringing greater visibility to the young artistes, some of whom have gained opportunities to perform nationally or create material for other agencies promoting science in the region. Prize Winners of the 2014 Science Music Video Competition are listed in Appendix 7. Selected videos from the competition to date can viewed at NIHERST Trinidad and Tobago YouTube.

Strategic Goal 2: Research & Intelligence Gathering

One of the key aims of the NIHERST strategic plan is to strengthen the institute's research and intelligence gathering capability, to better support economic diversification through clear policy direction supported by data and strategic foresight. NIHERST has made significant strides in this area through the following:

- the work undertaken by its S&T Statistical Department, which conducts surveys on STI and analyses the collated data to inform policy formulation and planning;
- the work of its Policy Research and Intelligence Department (PRID), established in the last quarter of 2011, to undertake international benchmarking and comparative studies on STI and to provide policy support and advocacy in developing a national STI policy, and in advising government on funding for R&D; and
- establishing a Science & Technology Research Database for Trinidad and Tobago - a portal for national researchers and research institutions.

2.1 S&T Statistical Research

NIHERST has the only dedicated regional capability for collecting S&T statistics for the benefit of policy analysts, researchers, educators, entrepreneurs and decision-makers and also contributing to international and hemispheric databases. Since 1996, the unit has been responsible for issuing 30 sector-relevant surveys and publications, covering topics or sectors such environmental awareness and practices; public perception of science; innovation in the local manufacturing and tourism sectors; the performance of students in science and mathematics; and surveys of science and engineering graduates. Data are uploaded onto the S&T Statistical Research page on the NIHERST website. The page received 24,716 hits over the reporting period, which was a 54.4 per cent increase from the previous financial year.

The Department published two reports on the Surveys of Environmental Awareness and Practices, 2013; and Innovation in the Assembly-type and Related Industries Sector, 2012. It also initiated two surveys: Survey of Secondary School Middle Form Students, 2014 and Survey of Mechanical Engineers, 2014. These two studies originated from NIHERST's participation in the Action Plan of Panama 2012-2016, OAS Working Group 2, which focuses on human resources, training and education. Additionally, the unit conducted its annual Survey of Science and Technology Indicators, 2014.

1. Survey of Environmental Awareness and Practices, 2013

This study is the second of its kind to be conducted by NIHERST as a similar study was undertaken in 2008. The empirical results of this study will measure changes in attitudes and behaviour towards the environment overtime and also facilitate and inform the development of effective

environmental management, conservation and communication policies. A report on the results of this study was published in January 2014.

2. Survey of Innovation in the Assembly-type and Related Industries Sector, 2013

This study focused on business establishments in the assembly-type and related industries sector of Trinidad and Tobago and provided a profile of these establishments along with indicators on technical product and process, organisation and marketing activities. The results of this study will provide insights into the innovation process in industry in Trinidad and Tobago and assist decision makers in developing policies to create the environment and incentives to foster economic growth. A report on the results of this study will be published in November 2014.

3. Survey of Secondary School Middle Form Students, 2014

The Survey of Secondary School Middle Form Students, 2014 targeted form three students in government, government-assisted and private secondary schools. The results of this study are intended to provide data on key education indicators necessary for the advancement of science and mathematics education, and also the promotion of scientific and technological careers amongst school students. Data were captured and analysed for publication and a draft report was compiled. The results of this study will be published in February 2015.

4. Survey of Mechanical Engineers, 2014

This study will provide information on the status and long-term outlook for mechanical engineering and mechanical engineering technology education from managers and practising engineers in Trinidad and Tobago. The results of this study are intended to assist decision-makers, researchers, educators, employers and, in general, stakeholders in mechanical engineering education and professional development. This study is still ongoing and the results will be published upon completion.

5. Survey of Science and Technology Indicators, 2014

This annual survey was designed to measure Trinidad and Tobago's investment in S&T and to provide data to the Ibero American Network on S&T Indicators (RICYT). The major objective of the enquiry was to maintain a reliable time series of S&T indicators of expenditure and manpower. The sectors surveyed included higher education, research institutions and public sector establishments. These indicators are available on NIHERST's website.

2.2 Research and Intelligence Gathering

The work of the Policy, Research and Intelligence Department (PRID) is organised into two categories:

- Technical Assignments, and
- Collaborative Strategic Assignments.

The latter category is further sub-divided into works completed with national as well as regional and international stakeholders.

2.2.1 Technical Assignments

National Science and Technology Policy

In FY 2014, the department continued work on refining the draft science policy document, following feedback from the executive management of NIHERST on the way forward for the policy. To effect these recommendations, it was necessary to conduct more in-depth interviews of stakeholders in academia and industry in an attempt to provide a more comprehensive description of the challenges in building STI capabilities at all levels of educational attainment, and the possible strategies that can be utilised to overcome these challenges. The department interviewed a variety of relevant stakeholders in academia and industry, including persons from: the Ministry of Tertiary Education and Skills Training; NIHERST's Science Education Department; Trinidad and Tobago Manufacturers Association (TTMA); The University of the West Indies (UWI) Centre for Excellence in Teaching and Learning; UWI's Department of Chemical Engineering, UWI's Department of Electrical Engineering; and The University of Trinidad and Tobago (UTT) Department of Graduate Studies. The department will also include an interview with the Educational Specialist attached to the Inter-American Development Bank.

National Science and Technology Fund (NSTF)

The PRID commenced work on designing the operational guidelines for the NSTF and the Terms of Reference for the Evaluation Committee responsible for overseeing the Fund. The department is also exploring a variety of financing facilities to be subsumed under the Fund. These funding facilities will help the NSTF achieve its objective of improving the allocation of resources towards research teams and enterprises in science and technology.

Mapping the Innovation Systems of Strategic Sectors in the Trinidad and Tobago Economy
The department reviewed literature on the methodological approaches utilised to map the innovation systems of strategic business sectors, and conducted preliminary desk research on the

energy services sector and relevant sub-sectors of the Information and Communications Technology (ICT) sector of the local economy. Following this, the department outlined the methodological steps to be applied in mapping the innovation systems for the energy services sector and sub-sectors within the ICT sector. To this end, the department met with representatives from ExporTT and its line ministry to attain further information that has served to refine and focus the innovation mapping exercises currently ongoing for the abovementioned sectors.

2.2.2 Collaborative Strategic Assignments

a) National Stakeholders

National Innovation Policy, MPSD – The PRID collaborated with the Socio-Economic Policy Planning Unit of the Ministry of Planning and Sustainable Development (MPSD) on the crafting of the National Innovation Policy. The department reviewed the Discussion Paper prepared by MPSD, and offered comments on thematic areas to be covered, as well as comments on the content of the document being used to guide stakeholder consultations on the development of the policy.

PROTEqIN Innovation Survey Instrument – The department reviewed and offered comments on the PROTEqIN Innovation Survey Instrument being used by the Arthur Lok Jack Graduate School of Business to ensure that the methodology utilised was relevant to Trinidad and Tobago's context, and followed the guidelines established in the Oslo Manual (2005) and the Bogota Manual.

Consultancy for an Assessment of the National Innovation Ecosystem – A review was in progress of the Terms of Reference for the Compete Caribbean Consultancy for an assessment of the National Innovation Ecosystem. The Department's Senior Policy Analyst, Julie David is a member of the Steering Committee on Innovation responsible for overseeing the consultancy.

b) Regional Stakeholders

The PRID also undertook a review of the draft Regional Policy for Quality Infrastructure prepared by the Caribbean Regional Organisation for Standards and Quality (CROSQ). Comments were prepared and submitted to the Trinidad and Tobago Bureau of Standards for transmission to CROSQ.

c) International Stakeholders

KISTEP-ISTIC Report – The department prepared Trinidad and Tobago's Science and Technology Country Report for the KISTEP-ISTIC's S&T Innovation Training Programme for High Level Policy Makers, 2013. The programme was held during the period 11-15 November, 2013 in Korea, and NIHERST Chairman, Professor Prakash Persad, attended on behalf of the institution.

ALCUE NET Project – The department, in collaboration with the Ministry of Science and Technology, contributed to the creation of a database of Trinidad and Tobago's bilateral and multilateral ICT-related research projects related to living labs, e-health, digital inclusion and smart cities. This database will contribute to the development of *ALCUE NET* – the Latin America, Caribbean and European Union Network on Research and Innovation, an initiative that is being funded by the EU's 7th Framework Programme. To this end, the PRID made contact with representatives of the UWI User Experience Living Lab (UXLL) and the Telecommunications Authority of Trinidad and Tobago to raise awareness of the ALCUE NET database, and to establish Trinidad and Tobago's priorities in the areas of digital inclusion and living labs.

Global Research Council – Senior Policy Analyst at PRID, Ms. Julie David, attended the Global Research Council's Meeting on Open Access to Publications in October 2013. The department reviewed the Global Research Council's a) Action Plan towards Open Access Publications and b) Statement of Principles for Funding the Future. Ms. David's attendance at the Meeting served to solidify the Americas' position on these two themes. Additionally, Ms. David presented to the Council on the "Status of Science and Technology in Trinidad and Tobago."

Draft CELAC Plan of Action – Comments were provided on the priority areas for action and the opportunities for collaboration in Science and Technology with member states within the Community of Caribbean and Latin American States.

Potential Areas of STI Collaboration between Japan and Trinidad and Tobago – A briefing document was prepared on the above-mentioned subject in preparation for bilateral discussions during the Official Visit of His Excellency Shinzō Abe, Prime Minister of Japan, to Trinidad and Tobago from 27 to 28 July, 2014. Specifically, the department identified potential areas and activities within science and technology, on which Trinidad and Tobago and Japan could co-operate based on mutual socioeconomic and cultural interests.

2.3 National Science & Technology Database and Country Status Report

Work commenced on the above-captioned database. The aim of this new project is to develop an updated system of researchers and research institutions that currently exist nationally. This database will help to promote collaboration among S&T research institutions and researchers nationally, as well as with international researchers/bodies seeking to collaborate with Trinidad in Tobago on S&T initiatives. The database will also aid NIHERST in the nomination and selection of local candidates for international awards as well as NIHERST's Annual Awards for Excellence in Science & Technology.

Additionally, it is anticipated that the database will facilitate the compilation of a country status report on S&T that will allow the local capabilities in S&T and Research and Development (R&D) to be matched to gaps identified from national science policy, sectoral policy documents and private sector needs reports and analyses. Funding allocations for S&T could better be identified, thereby promoting innovation and commercialisation of technology in priority areas.

Strategic Goal 3: Building Strategic Alliances

Central to NIHERST's mission to promote and advance STI in Trinidad and Tobago is the building and strengthening of collaborative/synergistic alliances with national, regional and international agencies. Such partnerships, particularly with global centres of excellence, tap into resources and expertise that can advance the institute's mission, help build national capacity and accelerate progress in priority areas. Some collaborations and exchanges enable NIHERST in turn to share its expertise with other national and regional agencies to support capacity building.

In FY 2014, the institute collaborated with the following:

- **Caribbean Council of Science and Technology (CCST) and the Technical Centre for Agricultural and Rural Cooperation – ACP/EU (CTA):**

    - ***The Caribbean Research Innovation and Entrepreneurship Network*** (RIENet) was established in 2010, supported and funded by the CTA and CCST in collaboration with NIHERST. The aim of the network is to build a virtual community of interest that encourages the sharing of experiences, the transfer of "know how" and the provision of role models to encourage a new generation of entrepreneurs and innovators in the region. RIENet continues to provide a valuable communications network that connects stakeholders in the research, public, private, and NGO sectors throughout the region. The articles featured on the website www.rienet.net have been sourced from a wide range of Caribbean countries, as well as international sources. It also provides a database of resource persons which can be used to enhance the outcomes of various

projects and initiatives in the region. A total of 72 articles were uploaded to the website during the 12 months covered by this report i.e. one new item for each of the following six theme areas in each of the 12 months:

- Around the Region
- Champion of the Month
- Research Update
- Success Stories
- Value Propositions
- Foresight & Innovation.

The network has 475 registered members, with a further 221 registered as 'followers' on RIENet Facebook.

In addition to those in the RIENet database, the e-alert continues to be circulated each month to all those who are members of the FAO's Carib-Agri e-mail network in the region and links to the updates are provided to the 1,400 members of the Trinidad and Tobago Entrepreneurship Club (TTEIC) (http://www.facebook.com/pages/Trinidad-and-Tobago-Entrepreneurship-Innovation-Club/191970450275?fref=ts), which has a demographic of 25 – 35 years of age; and the www.ttfi.net (TTFI) network (600 members plus 384 on Facebook).

The value creation associated with the RIENet during FY 2014 can be measured in a number of ways:

- Through the continuing satisfactory level of visits to the RIENet website (over 25,300 on average each month during the period) and the Facebook page.
- Through use of the RIENet database to support a number of specific projects including:
  - The World Bank's Climate Innovation Centre and M-Innovation projects. In both cases a significant number of RIENet members continued to be involved with both during the period covered by this report.
  - Participation and activities at CARIRI's Centre for Enterprise Development associated projects – business acceleration and ICT for SMEs.
  - The CTA/CARDI Coconut Sector Session in Guyana in late 2014 and the featuring of output over the ensuing months.
  - Numerous individual connections e.g. Carlone Moncur in the Bahamas with Neysha Soodeen of MACO Publishing (Barbados) and Rhonda Best of Alexander Bain (T&T and London), David Mullings (Jamaica/USA) and the CED Business Incubator, Ravi Ramkeesoon (USA) with various T&T groups, and Dillon Abdool with Mario Bento (Antigua) and Chinyere Nwaogwugwu (Jamaica).

- One of the primary objectives of the RIENet is to encourage information sharing and collaboration on a regional basis. These examples, coupled with the diversity of source countries associated with the monthly RIENet six theme area updates demonstrate that these objectives continued to be delivered upon.
- The challenge remains to be able to measure any contribution made by the RIENet and its participants towards economic and/or social progress in the region over the medium to longer term.

2nd Caribbean Young Professionals Science and Agriculture Film and Video Competition- "Adding Value to Local Foods"

The ACP-EU (CTA), CCST and NIHERST collaborated with the Caribbean Agricultural Research and Development (CARDI), The University of the West Indies (UWI), and the Trinidad and Tobago Film Company (TTFC) to host the 2nd Caribbean-wide science and agriculture video competition, targeting young professional. The project was administered by NIHERST. The competition was formally launched during the Caribbean Week of Agriculture on 10 October 2013 in Guyana. The launch highlighted the results of a survey of Caribbean people on local foods; showcased the winner of the first Caribbean-wide competition, which was a Trinidad and Tobago team, and how the experience benefited the team leader; and presented the second competition theme, video teaser and schedule of events.

This competition provided an effective platform for showcasing and nurturing the capabilities of creative, technology-savvy young Caribbean professionals (persons 18-35 years) with a passion for communicating the variety of ways that the full potential of science and technology can be leveraged for agricultural and economic development. The mission was to motivate young people "to engage cutting-edge digital film and video technology to produce compelling films that are well researched, highly entertaining, ethically sound and powerful in promoting agriculture and adding value to locally produced food for health and wealth creation throughout the Caribbean". The project focused not only on communicating information but also on strengthening the capacity of young professionals in the Caribbean to use ICTs and promote science, technology and innovation in solving the challenges facing the agricultural and rural sectors.

The competition aimed to:

- engage young professionals in science, technology and innovation issues for addressing agricultural challenges;

- discover and support young professionals in the Caribbean in creative modalities of promoting visibility of the importance of science, technology and innovation to improving agricultural and rural development in the Caribbean;
- support regional capacity-building in science communication, which will lead to enhanced public engagement in science, technology and innovation (STI);
- increase media interest in, and coverage of, science and technology issues and more specifically their relevance to agricultural and rural development in the Caribbean; and
- improve the communication of science, technology and innovation issues, as it relates to economic development and specifically agriculture and value addition.

Sixty (60) teams were selected from the 84 entries received (from 12 countries which were Haiti, St. Vincent, St. Lucia and the Bahamas, Barbados, Grenada, Suriname, Guyana, St. Kitts, Montserrat, Jamaica and Trinidad and Tobago) to participate in a hands-on, customised, training workshop, held in Trinidad from 7-11, April. Competition entrants were coached to produce world-class content by honing their filmmaking skills from the concept/script development to film distribution continuum. They were trained to achieve a great product with whatever device/s they owned or had access to, whether a tablet, iPad, iPod, iPhone, Android phone, camera, etc. They were also mentored by leaders in the film and video industry to produce their final products. Topics covered for film and video production included: Content Development/Script Development, General Introduction to Professional Audio Equipment, and General Introduction to Producing Shooting a Film utilising all skills learnt. Topics covered for animation included: Basic Drawing Techniques (for animation), the 12 Basic Principles of Animation, Software Tools (Basic 2D Toon Boom Tools and Basic 3D Maya Tools), and Stop Motion Animation. Each team was assigned two mentors - a scientist and an expert in film and video production who oversaw the final production of films and videos for showcasing during the competition finals.

A total of 36 videos, focussed on the competition's theme of "Adding Value to Local Food", were submitted for judging. The films emphasised areas for growth, and the entrepreneurship opportunities in the agricultural sector, through the application of science and technology, the adoption of sustainable agricultural practices, and the implementation of strategies for improving the marketability of local products to consumers, both at home and abroad. The videos highlighted these key issues around agriculture and food and nutrition security in the Caribbean and the need to add value to locally produced foods, through the eyes of young people. They serve as a mechanism for increasing the engagement of young professionals in addressing agricultural challenges through Science, Technology and Innovation, and in encouraging the use of ICTs for raising awareness, improving communication on science and agriculture and educating the public on critical issues.

The Conference and Awards ceremony were staged at the Carlton Savannah Hotel, Trinidad and Tobago from 27 – 29 August. Over 70 participants— filmmakers, animators, communication specialists, scientists and agricultural practitioners - from Barbados, Guyana, Haiti, Jamaica, St. Lucia, St. Kitts and Nevis, Suriname and Trinidad and Tobago, participated in the three-day conference, where the videos were also presented for judging and €10,000 in prizes were awarded. The conference sessions was led by local experts and top professionals who explored topics such: as the promotion of locally grown foods; increasing media interest in and coverage of, Science Technology Innovation (STI); supporting regional capacity-building in science communication; and utilising ICTs to help improve the environment for agricultural science and innovation. They also stressed the importance of the competition for "identifying and motivating new talent, developing skills, and promoting new concepts, technologies, products, services and brands and bringing them to the attention of a wider public and target groups such as policymakers".

The competition videos were showcased afterwards during the 13th Caribbean Week of Agriculture (CWA), held in Paramaribo, Suriname, from 6 – 10, October. The winning film was also shown shortly after the prize-giving during the Alliance of CARICOM Ministers of Agriculture meeting, attended by numerous ministers of agriculture from the Caribbean and leaders of the partner organisations involved in the CWA. The other videos were shown to participants during the course of the week. All the short films, which ranged from documentaries to fictional stories, celebrated local foods in one form or another, identifying novel prospects for adding value through processing, increasing production efficiencies and promoting nutritional and health benefits.

Videos submitted to the competition can be viewed at http://on.fb.me/1zpmNVZ and are listed in Appendix 7.

- ***Made in the Caribbean***

This project is coordinated by CCST and implemented by NIHERST, with grant funding from the Perez-Guerrero Trust Fund for Economic and Technical Cooperation among Developing Countries. The project seeks to help build a foundation of knowledge, skills, attitudes and behaviours conducive to the development of a culture of science, technology, innovation and entrepreneurship in the region.

NIHERST's technopreneurship and robotics camps were adapted and used as the model for this project. Through the period 23-30 August, four trainers from the NIHERST's Innovation Department shared their expertise with 20 national camp facilitators, including teachers from primary and secondary schools in St. Vincent and the Grenadines. They were trained to lead vacation camps and workshops for young inventors and innovators between the ages 7 and 17.

It is expected that through the technical assistance provided by NIHERST to participating countries that this project will assist in promoting youth innovation and invention on a regional scale. It is also expected that it will encourage national governments, non-governmental organisations and other institutions to provide much needed investment in the popularisation of science and innovation. Although it will take some time before the Caribbean is to be known for its "knowledge" industries or research centres, stimulating young people to innovate and think creatively will ensure that they see the world in non-conventional ways that will spur their entrepreneurial spirit.

The technopreneurship camps tapped the creativity of the children as they learned to design games, musical interfaces and video game controllers using everyday items such as paper, plasticine, water and paper clips. Technopreneurship fosters innovative and entrepreneurial thinking and skills using science and technology. The robotics camps also encouraged creativity and innovation. Using Lego Mindstorms NXT kits, complete with sensors to detect touch, sound, light and ultra-sonic waves, campers were able to assemble robots and program them to navigate through a maze which they also designed.

The counsellors were thrilled to gain additional teaching methods for engaging their students, in a more hands-on way, in learning about science and technology, and imparting the core values of creativity, invention, innovation, leadership and responsibility to the young campers. They found it very rewarding to see the children absorbing knowledge on subjects which just moments earlier they knew nothing about.

- **NASA – International Internship Program I^2**

  In August 2012, NIHERST signed an agreement with NASA to facilitate local students' access to NASA's International Internship Program (NASA I^2), in what is the first such agreement to be signed internationally, piloting the initiative for non-US interns. NASA I^2 is one of the most highly comprehensive internship programmes and the ultimate workforce preparatory experience for careers in STEM. It is a structured agency-wide program that provides a collaborative environment in which non-US interns (university undergraduate level students) or fellows (university graduate students) are able to work alongside international peers. Following the signing of the agreement, the program was opened to Trinidad and Tobago students, and 2014 was the first year that this programme was executed with nationals from Trinidad and Tobago. Students tackle practical problems that will see real applications in aerospace or on future NASA missions.

Local interns will be attached in the first instance to the NASA Ames Research Center (ARC) in California.

Work on promoting the programme and selecting candidates started in December 2013. Applicants were selected according to NASA's criteria: a minimum GPA of 3.0 or equivalent for institutions with a different marking scheme, a citizen of Trinidad and Tobago and two signed recommendations with contacts for referees. An application form of eight questions was also issued. The applicant also chose their areas of interest from a total of ten topics: Human Performance with Telerobotic Systems, CIF-NASA Biocapsule Technology for Delivery of Protein Therapeutics in Space, Biosensor Development, Advanced Life Support/Water Recycling Internship Opportunity, Air Revitalization Systems, Electronics Prognostics: Application to Capacitors, Power Electronics Prognostics, Developing Biologically Inspired Machine Intelligence for Sustainability Base, Developing an Intelligent Integrated Control and Alarm System for Sustainability Base and Data Mining and Analysis for Sustainability Base.

Twenty-one (21) applications were received and screened by a panel who employed a rigorous two-stage process. The first stage involved an assessment of the application form and supporting documents. This assessment measured the applicant's suitability in accordance with NASA's criteria as well as fitness for further research and their potential to represent Trinidad and Tobago.

The 21 applicants were short-listed to eight for interviewing. Students were assessed on key personal attributes i.e. maturity, team skills, ambassadorial and leadership qualities, and communication skills. The panel ranked the top five applicants for screening by NASA in order of priority. All information on the finalists was submitted to NASA and their selectors accepted the recommendation of the panel regarding the top two candidates for the 2014 internships.

They were Jason Renwick, a 2nd year student at the Department of Electrical and Computer Engineering, UWI and Stefan Hosein, a national scholar who had recently completed his B.Sc. at the Department of Computing and Information Technology, UWI. Both interns are required to continue with the research conducted at NASA for the period of one year at UWI upon their return to Trinidad.

- **US Embassy in Port of Spain**: **National Youth Science Camp (NYSC)**
  In 2012, NIHERST was invited by the embassy to be its local partner agency in assisting in the selection of Trinidad and Tobago candidates to attend the annual camp that takes place in West Virginia. It is open to secondary school students, 16 to 18 years old, from two educational districts which are rotated annually. The two

candidates receive a full scholarship. The nearly month-long camp offers opportunities for them to exchange ideas with scientists and other professionals from the academic and corporate worlds. The programme includes: lectures and hands-on research projects presented by scientists from across the US; overnight camping trips into the Monongahela National Forest; and a visit to Washington D.C. Selected delegates must not only demonstrate academic achievement in science, but also show potential for thoughtful scientific leadership. In 2014, 24 candidates from St. George East and Victoria educational districts applied. Alyssa Victoria Mike from St. Joseph Convent and Cindy Lisa Thomas from Naparima Girls' High School were selected.

- **The Toco Foundation: Environmental Solutions for Sustainable Communities.** In October 2011, NIHERST embarked on a project to develop more sustainable communities working with the Global Water Partnership-Caribbean and the Toco Foundation. This Environmental Solutions project offers community-based solutions that focus on the issues of sustainable development, disaster preparedness, water conservation through the use of rainwater harvesting techniques, and zero carbon living through the adoption of renewable energy. After consultation with the Barrackpore, Toco and Moruga communities the initial focus was on promoting the use of rainwater harvesting systems (RWHS) some of which were also combined with solar energy solutions in water-scarce rural communities.

  Rainwater harvesting is promoted as a technique to augment existing portable municipal supplies, and as a readily accessible emergency source of water in case of natural disasters like floods, landslide damages and hurricanes, which, may disrupt access to the main municipal water supply. Rainwater harvesting is also seen as one of the means of building climate resilience into the water sector in the Caribbean.

  The first installations of the RWHS were in July 2012 at a total of 9 schools in Barrackporre, Toco and Moruga. In 2013, three more schools in Barrackpore were included, and with additional funding from Phoenix Park Gas Processors, three more in Toco, Mayo and Fishing Pond. The RWHS at these schools were also outfitted with solar powered water pumps. The power from the solar panels supplement the schools' electricity during normal operations and in the event of a power outage, they power the water pumps so that the schools will have an uninterrupted supply of water.
  In FY 2014, the Lopinot, Guaico and Biche communities unveiled rainwater harvesters systems built by their own residents and installed at the Lopinot Community Centre, Biche Community Centre and Jubiliee Presbyterian School. In partnership with the Ministry of Community Development, the Water Resources Agency (WRA) and the GWP-C, the installation was accompanied by public education programmes on water

conservation. Over 500 students and residents from the La Veronica R.C, Primary School, Lopinot Early Childhood Care and Education Centre and Jubilee Presbyterian Primary School, Guaico, and Biche benefitted from this.

The community members from each community who were taught how to install these rainwater harvesting systems, received training on the science behind rainwater harvesting, maintenance procedures and entrepreneurship. Trainees are encouraged to ply their skills and create viable business opportunities for themselves in the supply and installation of the systems.

Many schools in Trinidad and Tobago are used as emergency shelters during a disaster incident. If the schools in this project are put into service as emergency shelters, the solar systems and rainwater harvesting system will ensure that these shelters have a supply of water, which is a necessity. As climate change continues to increase the intensity of natural disasters such as drought and flooding, these systems represent cost effective practical steps that small island nations like Trinidad and Tobago can take towards adaptation.

The public education programmes conducted at all schools teach students about the importance of water conservation and to help them better understand why the harvesters were being installed at their schools. It was also done to help students appreciate having the RWHS. Since the beginning of this project over 3000 students benefited from this awareness programme. In addition to helping to provide an additional safe water supply, the project is giving community members new awareness, knowledge and skills that can be utilised beyond their communities. With the spread of diseases like dengue and chikungunya, now more than ever it is crucial to raise awareness and promote safe and hygienic water collection practices.

The rainwater harvesters have proved to be very beneficial to the schools which have experienced water shortages, particularly in the dry season. The additional water supply has helped to decrease the amount of down-time created by the closure of school due to the lack of water. The RWHS provide water to flush toilets and wash hands thus improving on school sanitation and eliminating the offensive odour of unflushed toilets. The Rochard Douglas Presbyterian Primary School has estimated that the RWHS has cut its need for truck-borne water by half.

The initiative is also contributing to skills development and entrepreneurship. In each community, a cadre of 10-25 persons was trained to install and maintain the RWHS. Trainees attended entrepreneurship workshops, facilitated by NEDCO and other facilitators to help further develop their skills and knowledge base so that they can ply

their new skills within and beyond their communities. The trainees also took part in a follow-up workshop that focused on the costing of RWHS. With training in the installation and costing of the RWHS and in entrepreneurship, the trainees are now better equipped and empowered to go out into other communities to ply their skills and create viable business opportunities for themselves.

This small but exciting project has proved to be very beneficial to many schools and tradespersons. It is hoped that rainwater harvesting will become a sustainable practice that would benefit many more schools, individuals and communities throughout the country. This project was highlighted in international news by IPS-Inter Press Service for World Environment Day and in OAS COMCyT success stories in application of STI.

- **Scientific Research Council (SRC), Jamaica - INVOCAB**

In February 2014, NIHERST entered into a participatory initiative with the Scientific Research Council (SRC) in Jamaica for a three-year project entitled "Improving Innovation Capacities in the Caribbean" (INVOCAB). This EU-funded project is spearheaded the SRC and NIHERST, in collaboration with local stakeholders in Jamaica and Trinidad and Tobago, including the Ministry of Education.

This project was created to improve teachers' capacities in science education, as well as to implement an innovation framework in participating schools. It also aims to further integrate Science and Technology into the primary and secondary school curriculum and help change students' attitudes and dispositions towards science. Sixteen primary and secondary schools (eight primary and eight secondary) in Trinidad and Tobago and Jamaica collectively will benefit from planned activities under the project.

The action aims to contribute towards improving the levels of innovation in the Caribbean by building and strengthening capacities in STI, and specifically science education, as an enabler for poverty reduction, growth and socio-economic development of Caribbean countries by:

- improving the competence of teachers in the transfer of knowledge and technical skills of science subjects at the primary and secondary levels;
- improving students' capacity to think critically, problem solve and apply science
- promotion of science to the young by raising awareness; and
- promotion of S&T at all levels of society.

In August, 2014, NIHERST welcomed representatives from the SRC, the Ministry of Education, the Mico University College and Kingston Technical High in Jamaica. The officials visited the

NIHERST/NGC National Science Centre during 19-20 August for knowledge-sharing on the coordination and organisation of NIHERST summer camps.

The two-day visit entailed an extensive tour of the NSC and an arranged visit to three innovation camps, entitled Sci Spy, Eureka and Tech Camp, whereby the representatives were immersed into the coordination and execution of NIHERST innovation camps by way of reviewing camp manuals, observing activities and engaging in hands-on experiments. They engaged in discovery learning, problem-solving, peer-to-peer engagement and capitalise on knowledge transfer of how to creatively teach science subjects.
From 17-24 November, representatives from Trinidad and Tobago and Jamaica travelled to Technische Universität Dresden (TUD) in Germany to observe the running of their Global Innovation Week, and to share knowledge in the fields of science education, innovation and entrepreneurship. The team was exposed to best practices in organising and implementing an innovation programme through participation in such activities. The Ministry of Education also benefitted by being able to improve the curriculum of the Technology Education subject for form 3 students, adding components learnt during the Global Innovation week.

- **University of Leicester, Durham University, Imperial College London, the British Geological Survey (BGS), and UWI Seismic Research Centre (SRC) - Seismology in Schools:** This programme is an adaptation of the successful Seismology in Schools project developed in the UK and adopted by schools around the world. In July 2013 NIHERST partnered with the University of Leicester, Durham University, Imperial College London and the British Geological Survey (BGS) to implement the programme locally. One of the key coordinators of the project in the UK is Trinidad-born, Professor Aftab Khan, Professor Emeritus of Geophysics at the University of Leicester and a highly regarded expert in his field internationally.

  Taking part in this pilot initiative are: Arima North Secondary School, ASJA Girls' College San Fernando, Couva East Secondary School, Iere High School, Queen's Royal College, Lakshmi Girls' High School, Signal Hill Secondary School and St. Stephen's College.

  Launched in April, 2014, with the training of teachers from the participating schools, the programme will introduce the science of geophysics to students from forms three to six, give them a taste of how scientists work and see the physics, mathematics and geography principles being taught in the curricula come alive.

  This programme enables students to create theoretical seismology links with real world occurrences through the ability to record major global earthquakes and local disturbances. Recordings made could then be added to a national database where data

comparisons could be made with other schools around the world that are part of the Seismology in Schools Programme.

The programme additionally aims to promote understanding of basic science concepts through classroom activities that focus on seismology and earthquakes as a unifying theme. Such activities include:

- building a seismometer;
- simulating earthquake location with two microphones;
- modelling earthquake processes with a brick and sandpaper;
- simulating seismic waves with slinkies; and
- modeling earthquake damage from building resonance

State-of-the-art seismometers, which have been sponsored by NIHERST, Durham University and Imperial College London, were installed in the pilot schools and also at SRC and the NIHERST/NGC National Science Centre. The equipment is capable of monitoring seismic activity around the world. Students will collect data and study them using seismic analysis software. They will be the first students in Trinidad and Tobago to join the global network of schools in the programme and their data will be uploaded and shared on the BGS international database.

In order to ensure project sustainability and succession planning the following items form the support, monitoring and evaluation strategy:

1) Provision on an email address to all schools participating in the programme with the specific purpose of providing support to challenges or concerns that may be encountered. The email address which has already been distributed to the teachers involved in the programme is sis.support@uwiseismic.com. It will be monitored and responded to by the SRC and NIHERST SIS team.

2) Provision of a networking platform for teachers, students and administrators of the programme to interact, share ideas / information and discuss problems. This has already been implemented in the form of a facebook page called Seismology in Schools - Trinidad and Tobago and could be found at: https://www.facebook.com/pages/Seismology-in-Schools-Trinidad-and-Tobago/272086322972644?fref=ts. Information and activities of relevance to the programme and the topic of seismology as well as answers to questions would be addressed by SRC and NIHERST.

3) Identified links on the secondary school forms 3-4 physics, mathematics and geography curriculum to the activities that could be conducted by the seismology instrumentation. This would allow for the stations to be used in classroom activities where both teachers

and students would place a greater value on the lesson material. The Ministry of Education's Curriculum Division (namely, the officers for physics, math and geography) would be responsible for this area.

4) Identifying activities/ projects through the use of the seismology stations that could be used in SBA assignments. The Curriculum Division would also be responsible for this area.

Section 4: Financial Operations

a) Budget formulation

The institute's budget is prepared based on the activities and programmes aligned to its strategic plan and is formulated in accordance with guidelines in the Call Circular issued by the Ministry of Finance for the relevant year in which the budget is due. The budget is primarily funded by Government by way of subventions, which account for approximately 95% of the total budget. The institute generates the other 5% by way of miscellaneous receipts. The Board approves the budget before it is sent to the line Ministry.

b) Expenditure versus income

Total Income under the Recurrent Budget increased from $36,603,060 in 2012, to $36,200,000 in 2013 to $40,500,400 in 2014 which represents a slight decrease of 1% and an increase of 12% respectively over the income in 2014.Revenue from sources other than government's subvention increased from $1,063,699 of total income in 2012 to 1,370,846 (29%) in 2013 and decreased to $1,294,965 (6%) in 2014. Expenditure was reduced from $35,324,291 in 2012 to $35,187,895 in 2013 (0.5% decrease) and increased to $35,879,539 in 2014 (2%). Unspent funds amounted to $3,638,239 in 2013. Unspent funds in 2014 totalled $1,672,887, which were due primarily to unspent balances in Hosting of Conferences and Seminars, Promotions, Publicity and Printing, and Other Minor Equipment Purchases.

Income under the PSIP increased from $8,050,000 in 2012 to $19,300,000 in 2013 and $69,000,000 in 2014 which represent corresponding increases of 140% and 258% over the 2014 allocation. Expenditure increased from $7,172,973 in 2012 to $12,436,441 (73% increase) in 2013 and $31,727,551 (155% increase) in 2014. The increase in expenditure was due mainly in respect of payments to consultants in the starting of the construction of the National Science Centre (or Science City) project.

Following is a summary of the expenditure versus income for the reporting period.

Account (Sub-Head/Item/Sub-Item)	2011	2012	2014
A. RECURRENT EXPENDITURE	$	$	$
INCOME			
01 Government Subvention	28390,864	36603,060	34863,613
04 Other Income	1288,024	1063,699	1294,965
TOTAL INCOME	29678,888	37666,759	36158,578
EXPENDITURE			
01 Personnel Expenditure:	6916,197	6104,061	6263,710
02 Goods and Services	19503873	26877,644	24870,261
03 Minor Equipment Purchases	690,624	969,681	1736,680
04 Current Transfers and Subsidies	1483,120	1372,905	1897,973
TOTAL RECURRENT EXPENDITURE	28593,814	35324,291	34768,624
B. DEVELOPMENT PROGRAMME			
INCOME:-- Government Subvention	6353,000	8050,000	31642,153
EXPENDITURE			
Establishment of a National Science Centre	0	1300,152	22,188,036
Sci-TechKnoFest	3123,379	1574,971	4914,604
Development of a National Innovation System	1094,377	2278,314	1000,000
Research & Development Foresighting	191,931	404,600	193,360

Exhibitions on the Environment	488,245	680,823	650,000
NIHERST- President's Award Scheme for Excellence in Science Teaching, Research & Development	306,076	534,775	770,994
	179,057	236,351	500,000
Community-Centered Design and Innovation (COMDESI)			
NISTADS / NIHERST Collaboration on S&T Policy Studies	0	162,987	335,159
Upgrading of the National Science Centre, D'Abadie	500,740	0	0
Expansion & Upgrade of 8 Serpentine Place	0		1000,000
Document Handling System			90,000
TOTAL DEVELOPMENT PROGRAMME EXPENDITURE	5883,805	7172,973	31642,153

c) Debt policy

NIHERST does not have a debt policy but consideration is being given to developing one.

d) Investment policy

NIHERST also does not have an investment policy. Consideration is being given to having one developed by a consultant.

e) Internal audit functions

There is one junior post on the establishment for an internal auditor. However, due to the unattractive compensation, the post has been vacant for several years and this function has been outsourced as funds permit.

f) Financial Report 2014

The Auditor General completed the audit of the 2010 Financial Statements in August 2014. The audit of the Financial Statements for 2011 is scheduled to begin in early 2016. NIHERST is awaiting the audited Financial Statements from 2004 to 2007 from the Auditor General's department. The private auditor, R. Ramdass & Company Ltd, contracted by the NIHERST to audit the 2011 and 2012 Financial Statements, is still to submit the audited statements.

Section 5: HUMAN RESOURCE DEVELOPMENT PLAN

a) Organisational establishment

As at 30 September, 2014, NIHERST employed 125 persons on a full-time basis (consisting of permanent, long-term contract, and short-term contract) with a significant number being employed in contract positions aligned to civil service posts and salary ranges in order to maintain internal equity with permanent staff.

The Board of Governors through its Human Resource Committee continued its work with Management on the proposed restructuring of the institute which would equip it to better facilitate the successful implementation of its strategic plan. The procurement process for the provision of specialist consultancy services for the development of a new organisational structure and compensation system for NIHERST, including the conduct of a job evaluation and compensation survey, was completed. In October 2013, the NIHERST Board of Governors approved the contracting of the services of HRC Associates for the job. The project was scheduled to start in November 2013 and end in February/March 2014. In accordance with the project work plan, management committees were set up, data was provided to the consultant, meetings of the management committees and the consultant were held, and a town hall meeting was convened with staff and the recognized majority Union, the Public Services Association of Trinidad and Tobago (PSA).

The PSA expressed its wish for a more collaborative approach since the project had already started and the Union was only now invited to join in the job evaluation phase. The Union asked to be an equal partner at the table to ensure the interests of the employees are served and protected. Work on the project ceased while NIHERST held talks with the PSA. The PSA was to submit a proposal for NIHERST to contribute part of its budget to the PSA to do the necessary research to participate as an equal partner in the restructuring exercise. NIHERST did not receive any such proposal for the rest of the budget year and funds were allocated for the entire project to be completed within the 2014 budget year.

b) Category of employees

The institute's operations are carried out by two major categories of staff, which are permanent and contracted officers. When first conceptualised, the institute's staffing needs were met by officers who met the government standard requirements given the prevailing technologies of the day. Moreover, the requirements for employees given its portfolio at the time, was very small. As the institute's workload expanded, there was a need to recruit and maintain a workforce of a greater number in a variety of new directions. These events gave rise to the dual categories that exist at present. For the jobs made necessary by changes in technology and new areas of endeavour, a

substantial number of contract officers were hired to complement those who held established positions. The job categories also include manipulative, clerical, secretarial, administrative, technical and professional.

NIHERST also hires part-time science demonstrators who assist with explaining science exhibits and concepts to visitors at the National Science Centre. The institute continued to facilitate the MTEST on-the-job training programme with 19 trainees gaining experience at its offices during the review period.

c) Career path systems

Career path systems at NIHERST are similar for most positions. Manipulative staff are the exception here with all employees in these positions generally operating without stratification. Manipulative staff can, however, move into other classes (clerical, etc.) once they show the requisite experience, attitude and qualification. In the other classes, there is stratification and here employees can move to the next grade once they meet the requirements and a position is available. There are insufficient levels in each job family remaining at NIHERST because a number of positions were transferred to COSTAATT in the year 2000.

d) Performance assessment/management strategies

The institute's employees are assessed annually using the Performance Management System used in the Public Service. The Human Resource Department supports supervisors and managers where necessary by providing draft standards/targets for job duties against which the performance of employees is measured.

e) Promotion – selection procedures

The selection procedure for promotion within Article 4: Employment and Promotion in the NIHERST-PSA Collective Agreement was applied for both permanent and contract employees (see Appendix 5). Attention is drawn in particular to the following, which states that:

"ARTICLE 4: EMPLOYMENT AND PROMOTION

(1) Appointment to the permanent establishment shall be conditional on -
(a) passing a medical examination conducted by a specified medical practitioner; and
(b) satisfactory completion of a probationary period of twelve (12) months.

(2) During the probationary period either party may terminate the employment at any time with seven (7) days' notice.

(3) The period of probation may be extended where NIHERST considers this desirable but in no case shall the total period of probation exceed eighteen (18) months.

(4) The appointment of an employee on probation may be confirmed before the expiry of the probationary period.

(5) The Institute will inform the Union of all persons who are confirmed in their appointments to the permanent establishment.

(6) It shall be the policy of the Institute to fill all vacant positions by promotion from within NIHERST, therefore, when promotional opportunities arise vacancies will first be advertised within the Institute.

(7) If no suitable candidate is found among the employees the post will be advertised through the news media.

(8) In determining suitability for promotion merit shall be the main criterion. However where two (2) or more employees are equally suitable seniority shall be the deciding factor.

(9) On promotion an employee shall receive an increase in salary not less than the value of an increment in his former salary scale.

(10) NIHERST will supply the Association with a copy of the job specification for each category of position on its permanent establishment as designated by the job titles in the Schedule of Salaries attached to this Agreement. Copies of these specifications will also be available for scrutiny by employees.

(11) Each employee shall be given a list of his/her specific duties.

(12) Both parties agree to meet to develop a system of performance appraisal."

f) Employee support services

Staff Development and Training 2013 - 2014

NIHERST encourages staff development in order to achieve enhanced individual and organizational effectiveness. This has been imperative in the context of its operating environment and mandate. NIHERST has therefore provided opportunities for employees to upgrade their job knowledge and skills through short professional training programmes. It has also supported employees who meet the criteria in the pursuit of tertiary and higher degrees, where there is mutual benefit.

During the year October 2013 to September 2014, training and development continued to strategically focus on the capacity development of staff by expanding the knowledge, skills and abilities of key personnel in key departments in the areas of Science, Technology and Innovation in preparation for the NIHERST Science City. These include but were not limited to Disney's Approach to Quality Service, NIHERST Science City - Strategic Planning, and Technopreneurship for the Caribbean. We were generally directed by the government's goal of attaining sustainable integral development and a more diversified knowledge-intensive economy.

Purpose for training

The overall aim of NIHERST training and development programme is to enable staff to develop in the areas necessary to increase their productivity on the job and enhance self-growth for long-term professional development and to strategically contribute to the objectives of the organisation.

Some objectives for the training conducted in 2013-2014 include:

- Improving the necessary competences of staff required to contribute to the areas of STI
- Increasing the promotion of S&T at all levels of society
- Promoting Creativity, Inventiveness and Entrepreneurship
- Gaining practical knowledge in Innovation in Education and Business to continue to strengthen the business arm of the institution
- Updating existing technical knowledge and skills in the area of Microsoft Windows Server for ICT
- Exposing staff to various topics relevant to technopreneurship and innovation
- Creating brand ambassadors for the new image of NIHERST as a world class STI institute
- Training key staff in health and safety to ensure the organisation complies with OSHA's safety requirements. In addition to implementing NIHERST HSE Committee.
- Providing employees with the opportunities for personal growth and professional development.

The key training programmes attended were:

1. International Society for Technology in Education (ISTE) Conference and Expo 2014, Atlanta, Georgia, USA
2. INPEX – The Invention & New Product Expo 2014, Pittsburgh, USA
3. MCSA 2008R2 & MCSA 2012 – COMBO Bootcamp
4. Caribbean MIX Leadership Conference
5. VII Americas Competitiveness Forum 2014- The Human Imagination at Work.

During the period, 61 persons received individual training, some of whom conducted "knowledge sharing sessions" with other staff members either in their department or at

management/supervisory level in order to pass on valuable information or to enlighten team members.

Group Pension, Health and Insurance Plans

NIHERST has a pension fund plan for its permanent employees established since January 1, 1988. As at September 2014, there were 59 members, 41 from NIHERST and 18 from COSTAATT, 17 pensioners and 7 deferred pensioners. NIHERST and COSTAATT contributed at the rate of 17.7% of basic salary and the members contributed at the rate of 6% of basic salary. The Institute approved a 2.7% increase to pensions in payment with effect from January 1, 2014.

NIHERST provides a Group Health and Life Insurance Plan for all employees, permanent and contract, if they wish to join. As at September 2014, there were 59 members on the plan, with 4 members being retirees. The Life Insurance and Accidental Death & Dismemberment (LADD) benefit was $200,000.00 and NIHERST contributed 50% of the premium for this benefit. Major medical coverage was $500,000 and NIHERST contributed 60% of the premium in respect of the health insurance benefit.

Employee Assistance Programme

NIHERST has been contracting the services of Petrotrin EAP Services Limited (PEAPSL) to administer and provide an Employee Assistance Programme (EAP) to all members of staff since December 1, 2004. The services provided include organisational support; assessment, counselling and referral services; management/supervisory training; transition management; prevention services and peer support. The PEAPSL contract for these services runs from 1 March to 28 February each year.

During the period of this report, three educational outreach sessions were conducted as shown below.

Date	Session
19 Sept 2013	Ethics in the workplace
9 May 2014	For Women Only
16 May 2014	For Men Only

The staff continued to make use of the services of the EAP through the outreach sessions and also through the counselling sessions provided which ensures strict confidentiality and promotes the wellbeing of staff. The EAP continues to constitute a benefit and also a safety net for staff who see the need to utilise its services.

Section 6: Procurement Procedures

The procedures in effect for the period under review followed the NIHERST procurement policy. Relevant aspects are quoted below:

> "NIHERST shall invite and consider offers and tenders for the supply of articles or services or for the undertaking of works of all kinds necessary for carrying out the functions of the Institute. A minimum of three quotations are required."

> "In cases of emergency where the safety of people, property, plant and equipment is in jeopardy or where the continuity of the operations of the Institute or its fiscal health demand that contract(s) be awarded with urgency, the **President** and/or **Board of Governors** may award contracts as determined to avert the danger or to bring the situation under control and minimise the loss or liability. The Chairman of the Management Tenders Committee may also give approval to award contracts in this instance if the contract to be awarded is within the limit of the Committee."

> "Whenever the expenditure to be incurred for the acquisition of articles or the undertaking of works or services exceeds $10,000.00, the (Management Tenders) Committee shall invite a <u>minimum</u> of three (3) firms or persons as may be selected by the Committee to make offers for their supply. In the case of articles or services involving expenditure less than TT$10,000.00, Heads of Departments can invite proposals or quotations."

> "Alternatively, the Committee may opt to place a notice in the print or other media inviting offers for the supply of the articles or the undertaking of works or services whenever the Committee deems it desirable to do so such as in the case where the Committee is unaware of the vendors who are capable of the job or in the case of expected large tender amounts."

> "Public invitations must be invited for the acquisition of articles or the undertaking of works or services of the value of $5,000,000.00 and above. Such invitations should be duly signed by the Chairman of the Management Tenders Committee."

> "The Committee may use its discretion in inviting a sole tender in the following cases:
> - where the item is made by a sole manufacturer or is available from a sole distributor;
> - when replacement parts and accessories of equipment and machinery of a particular make or model are available from only one source;
> - for standardisation purposes; and
> - where no-one else can provide the services or work to the standard and/or timeline required by NIHERST.

The reason for inviting a sole tender must be properly recorded."

The Management Tenders Committee can approve contracts valued at $100,000 or less, while the NIHERST President approves contracts up to $450,000. The Board approves contracts in excess of $450,000 with guidance from the Finance & Audit Committee of the Board.

Appendix 4 shows the contracts over $450,000 that were awarded for the period under review using the tendering process. There were only three (3) such contracts, of which all were selective tenders. They were for: 1) a specialist consultancy services for a job evaluation & compensation survey; (2) purchase of equipment for the Technology Lab at Science City; and (3) purchase of two vehicles.

Section 7: Public and Community Relations

a) Client and public access to services/service delivery systems

NIHERST strives to ensure that all members of the national community are aware of and have access to its programmes and the information it disseminates. Advertising and information dissemination are done through traditional and social media, as well as on the NIHERST website, and promoting to schools is through direct marketing. In many of its science popularisation activities, the Science Centre reaches out to rural and underserved communities, particularly through its Community Science Weeks and road shows, and events hosted by external agencies. The institute also offers free/reduced admission and provides transport, so disadvantaged persons can still attend or participate more easily.

In FY 2014, NIHERST increased its expenditure on traditional media (print), creating advertorials after all events and for commemorating STI-related international days, so as to increase visibility of the NIHERST brand and its core programmes.

b) Community and stakeholder relations/outreach

(See paragraph above as well as Section 3.)

c) Strategic partnerships (local, regional and international)

Details of all projects undertaken with key regional and international agencies are given in Section 3: Building Strategic Alliances.

Following is a list of the main local, regional and international agencies and organisations that collaborated with NIHERST during the period being reported on, as sponsors on key initiatives and/or exhibitors and facilitators at key events. Several are longstanding partners who have embraced the NIHERST mission and add great value to our programmes and activities for the public.

List of key partners during reporting period

British Geological Survey
Caribbean Academy of Sciences (CAS)
Caribbean Council for Science and Technology (CCST)
Columbus Communications
Durham University
Embassy of the United States of America
European Union

Global Water Partnership-Caribbean (GWP-C)
Grande Exhibitions
Imperial College London
Ministry of Education
Ministry of Planning and Sustainable Development
Ministry of Science and Technology
NASA
Organization of American States (OAS)
Scientific Research Council (SRC)
Seismic Research Centre (SRC)
Technical Centre for Agricultural and Rural Cooperation – ACP/EU (CTA)
Technische Universität Dresden (TUD
Telecommunications Authority of Trinidad and Tobago (TATT)
The Heroes Foundation
The National Gas Company of Trinidad and Tobago (NGC)
The University of Trinidad and Tobago (UTT)
The University of the West Indies (UWI)
Tobago House of Assembly (THA)
Toco Foundation
UNDP (Perez-Guerrero Trust Fund)
University of Leicester

Sci-TechKnoFest 2013 Exhibitors

Angostura Holdings Ltd,
Arthur Lok Jack Graduate School of Business
Artistic Revolution
BorderCom International
Briko Air Services
Caribbean Agricultural Research and Development Institute (CARDI)
College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT)
Environmental Management Authority (EMA)
Forestry Division
Global Water Partnership Caribbean
Hop Along Learning
Institute of Marine Affairs (IMA)
Kenson School of Technology Limited
Metal Industries Company Ltd (MIC)
Ministry of Energy and Energy Affairs
National Energy Skills Centre (NESC)
National Museum and Art Gallery
National Training Agency (NTA)
Office of Disaster Preparedness and Management (ODPM)
Offshore Technology Solutions Ltd
Pan Trinbago

Petrotrin Petting Zoo
Powertrin Ltd
Professional Airline Training Solutions Ltd (PRO-ATS)
Serpentarium Trinidad/Reptile Conservation Centre of Trinidad and Tobago
Sugarcane Feeds Centre
Telecommunications Authority of Trinidad and Tobago (TATT)
Trinidad and Tobago Electricity Commission (T&TEC)
Trinidad and Tobago Cancer Society
Trinidad and Tobago National Commission for UNESCO
The National Gas Company of Trinidad and Tobago (NGC)
The University of Trinidad and Tobago (UTT)
The University of the West Indies (UWI)
Water and Sewerage Authority of Trinidad and Tobago (WASA)

Community Science Weeks:
Exhibitors and Contributors to Career Day
Arrive Alive
British Gas
Cocoa & Coffee Industry Board
Eastern Regional Health Authority
Environmental Management Authority (EMA)
Fisheries Division
Forestry Division
Forestry Information Unit
Institute of Marine Affairs (IMA)
Life Guard Association
Ministry of Food Production & Marine Affairs
Ministry of Health
Office of Disaster Preparedness and Management (ODPM)
Petrotrin
Petrotrin Petting Zoo
Rapport Services
Sugar Cane Feed Centre
The National Gas Company of Trinidad and Tobago (NGC)
Toco Handicraft Group
Turtle Conservation Group