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

to Parliament for Fiscal Year 2014- 2015

Report of NIHERST
for Fiscal Year 2014 - 2015

NIHERST

NATIONAL INSTITUTE
OF HIGHER EDUCATION
RESEARCH SCIENCE AND TECHNOLOGY

INCORPORATED BY ACT OF PARLIAMENT ACT NO. 20 OF 1984

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FOREWORD

During fiscal year (FY) 2015, NIHERST strengthened core and signature programmes and embarked on new initiatives, all of which served to advance the institute's mission to help build Trinidad and Tobago's capacity in science, technology and innovation (STI). For decades, NIHERST has kept its focus, and therefore national attention, on the importance of science, technology, engineering and mathematics (STEM) education; fostered new avenues and mechanisms for promoting indigenous research and development (R&D); driven policy formulation in S&T; and encouraged the kind of citizen awareness, engagement and creativity that is now critical to economic growth, diversification and global competitiveness.

Activities in the past five years have been aligned under the following key, interlocking objectives laid out in the institute's Strategic Action Plan for 2011-2015:

- **Fostering a National Culture of Science, Technology and Innovation.** This includes NIHERST's pioneering and extensive STEM education and popularisation activities, spearheaded by the National Science Centre (NSC), and to be expanded considerably through the NIHERST Science City initiative. The institute was the earliest, and is still today, the single most important contributor to the development in Trinidad and Tobago of the STEM learning ecosystem, bringing diversity and greater inclusivity to education in these disciplines. NIHERST also hosts annual national awards schemes and competitions to recognise and reward the outstanding achievements of Trinidad and Tobago's leading scientists (based locally or abroad), as well as the efforts of accomplished and aspiring innovators and inventors of all ages and from all walks of life.

- **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, to measure the scientific, technological and innovative capabilities in key industries and support the development of science education in the country; and the work of the Policy Research and Intelligence Gathering Department on a national science and technology policy, mapping the innovation systems of strategic sectors in the Trinidad and Tobago, and providing input into the policy-related activities of other public agencies.

- **Building Strategic Alliances**. The work in this area enables NIHERST to access resources and expertise in global centres of excellence to accelerate progress in STI priority areas. The institute's strong track record has made it a first partner of choice in the region for

project collaboration with institutions like NASA wishing to extend their global reach, as well as development and donor agencies.

Science education and science popularisation

In FY 2015, public interest in the institute's non-formal science education offerings continued to grow. Visitors to the NSC increased by 50 per cent from the previous year; the popular science, technology, innovation and invention vacation camps, hosted at the NSC and other venues in T&T during the vacation periods, were oversubscribed; and participation by NIHERST at events hosted by external agencies reached more persons, especially children, than in FY 2014. A significant new initiative during the reporting period was the opening of the FABLAB (Fabrication Laboratory) at NSC, the first of its kind registered in Trinidad and Tobago and the region and part of the global FABLAB network. The FABLAB offers training for citizens, and in particular secondary and tertiary level students, and gives them access to the facilities to develop their innovative designs and prototypes.

NIHERST's expertise in alternative education approaches has also enabled it to create programmes that directly support the formal teaching and learning of science in schools, and provide training for educators in new and developing technologies, such as robotics, as well as aspects of the primary and secondary curriculum that are challenging to grasp and therefore teach. One major programme currently being piloted in 16 schools is the three-year, EU-funded INVOCAB (Improving Innovation Capacities in the Caribbean) project, spearheaded in collaboration with the Scientific Research Council in Jamaica and the Ministry of Education in Trinidad and Tobago. The project aims to improve teachers' capacities in science education, implement an innovation framework in schools, and further integrate Science and Technology into the primary and secondary school curricula.

In addition to its ongoing collaboration with NASA to facilitate local tertiary STEM students' participation in NASA's international internship programme, NIHERST also launched new STEM education and/or community outreach projects in partnership with the following:

- Institute of Electrical and Electronic Engineers (IEEE) and IEEE Trinidad and Tobago Section: Memoranda of Cooperation (MOCs) were signed with the IEEE. The goal is to work together in areas of mutual interest in STEM on world- changing technologies – from computing and sustainable energy systems to aerospace, communications and robotics, focusing on pre-university activities for teachers and students and other avenues for inspiring the next generation of engineers and scientists. The first fruit of the partnership was the donation of an E-Scientia Exhibit which was installed at the

National Science Centre, and shows the application of engineering and computing to solve problems.

- British Gas/Sacoda Serv Limited: Through a formal agreement, NIHERST will provide support for 250 students in the areas of East, Port of Spain and South Trinidad, to improve and broaden their knowledge of STEM concepts. The project titled "Youth Build" promotes the use of design-based learning approaches to STEM instruction that actively encourage students to work out solutions to design problems that impact their local communities.

Science City

NIHERST pressed ahead with implementing Phase 1 of its Science City complex. A one-month media campaign was also executed, aimed at building public awareness around the social value of a family-centred learning environment, and illustrating the central role science, technology and innovation play in development. The campaign material hinted at the breadth of possibilities the Science City concept contains, and was designed to stoke curiosity and garner public buy-in. It was very effective, judging from the considerable interest and enthusiastic feedback the institute received.

Awards and Competitions

Under its Awards for Excellence in Science and Technology 2014/15, NIHERST honoured nine men and women. For the Prime Minister's Awards for Scientific Ingenuity scheme, almost double the number of entries was received compared to the previous year.

Research and Intelligence Gathering

The S&T Statistical Department published the results of its Survey of Secondary School Middle Form Students, 2014, and continued with the Survey of Mechanical Engineers, 2014. Three new surveys were also undertaken in 2015. NIHERST also formally launched STResearchTT, a national science and technology research database advance local R&D and innovation. The primary goals are to provide access to biodata on Trinidad and Tobago researchers in an effort to give greater visibility to the capacities of research professionals. The database will also facilitate the compilation of a country status report on S&T and R&D that will allow local capabilities to be matched to gaps identified from national science policy, sectoral policy documents and private sector needs reports and analyses.

Full 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.

New horizons

As the financial year came to a close, NIHERST was placed under the purview of the Ministry of Education, with whom it has worked closely for most of its 30-year history. The institute therefore feels confident about continuing to further the STEM education goals of the ministry. As the international community now moves beyond the early core Millennium Development Goal of 'a basic education for all', towards a renewed, post-2015 vision and agenda that emphasises the link between inclusive education and sustainable development, NIHERST is well poised to help bring Trinidad and Tobago into greater alignment with this global development thrust.

Section 1: Vision, Mission, Philosophy and Strategic Objectives

NIHERST has been pursuing a strategic action plan for the last five years that aligns with the Government of Trinidad and Tobago's policy framework and the seven interconnected pillars for sustainable development. The Strategic Action Plan, 2011 – 2015 attempts to re-assert NIHERST's valuable role and unique position in the country's institutional infrastructure for advancing national development in STI and aligns in particular with development pillar 1: People Centred Development and development pillar 5: Creating a More Diversified, Knowledge-Intensive Economy. See Appendix 1 for a copy of the Action Plan.

The following is a summary of the operational goals and expected outcomes that are outlined in the plan:

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.

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.

   NIHERST also administers Awards for Excellence in Science and Technology, which aim to highlight and honour 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. **Services/Products**

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
FABLAB	Workshops and access to equipment for 3D design and 3D printing in order to bring creative ideas to fruition. Average price – TT$40 per hour
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 (NSC) Free to join SciEng Club (Debe) Free to join Robotics Club (NSC) TT$100 to join Tech Club (NSC; POS) TT$100 per term
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: Eco-ribbean CD ROM and 3-part video animation on 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 of Secondary School Middle Form Students, 2014 - Survey of Innovation in the Assembly-type and Related Industries, 2013
Policy Research and Development Department	Policy support and advice to line ministry and other agencies with respect to STI policy Sector innovation mapping studies
International Projects Department	National S&T Research Database for Trinidad and Tobago

3. Special projects and collaborative relationships

Collaborating Agency	Project
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 (SIS) project
U.S. Embassy in Port of Spain	National Youth Science Camp, West Virginia, U.S.A.

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. The Board comprises thirteen (13) members (excluding the president) and its membership was as follows:

Prof. Prakash Persad –Chair

Mr. Brian Juanette – Deputy Chair

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. Ann Marie Phillip-Hosein- Member

Ms. Denice Ramdhan – Member

Mr. Nicholson Sookhoo - Member

Mr. Andre Thompson – Member

Ms Joycelyn Lee Young (Ag. President) – (Member ex-officio).

There were six (6) sub-committees - Human Resource, Finance, Audit, Tenders, Communication and Science City - that were established to consider matters in their respective areas and provided recommendations to the full Board.

During the period under review, the executive leadership team was diminished by the retirement of several stalwarts who had played groundbreaking roles in execution of the NIHERST mandate. Foremost among these officers was Mrs. Maureen Manchouck, President for over two decades, who had built the institute from its inception and who was a regional pioneer in science popularisation. Another was Mrs. Kalawati Sookhram, Administrative Officer IV (NSC), who helped to develop the NIHERST science popularisation programme from its early days as the Yapollo travelling exhibition to the National Science Centre at D'Abadie with its plethora of non-formal science education offerings, and Ms. Althea Maund who headed the Science Education Department of NSC for over 17 years and ensured close alignment with the school science curricula. Another significant loss was Mr. Daniel Deen, who pioneered the collection of statistics on Science, Technology and Innovation, which is a specialised area of statistics. Mr.

Deen headed the S&T Statistical Unit for 15 years. The Accounts Department also lost Mr. Nazir Mohammed, Senior Accountant, who headed the Accounts Department for two decades.

The leadership team in 2015 comprised:

President (acting) – Ms. Joycelyn Lee Young
Vice President of Science and Technology – vacant (since 1991)
Registrar (acting) & Senior Human Resource Officer – Mrs. Giselle Dinzey
Senior Accountant – Ms. Sylvia Lalla
Acting Senior Project Officer – Ms. Lovaan Superville
Senior Science Educator - Mrs. Larrisa Mohammed
Acting Senior Statistician - Ms. Sharon Parmanan
Senior Policy Analyst – Ms. Julie David
Systems Analyst II – Mrs. Kathy-Ann Joseph-Creese
Administrative Officer IV (NSC) – Mrs. Lorraine Rollock.

The institute's corporate structure by function, as at October 01, 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 acting Senior Statistician and Senior Policy Analyst respectively. They both report to the President. The policy department has a cadre of five officers while the statistical department has three officers, who are supplemented by field officers 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 and their total staff complement is 40 officers as follows: (a) the Science Education Department, which is led by the Senior Science Educator who supervises nine officers; (b) Library Media Centre, which houses a special collection of resources in S&T Policy and Science Education, and which has a small staff of two officers inclusive of a Senior Librarian; and (c) Administration and Facilities, which is led by the Administrative Officer IV who oversees 27 officers. Complementing NSC's work is the Innovation Department, which undertakes initiatives

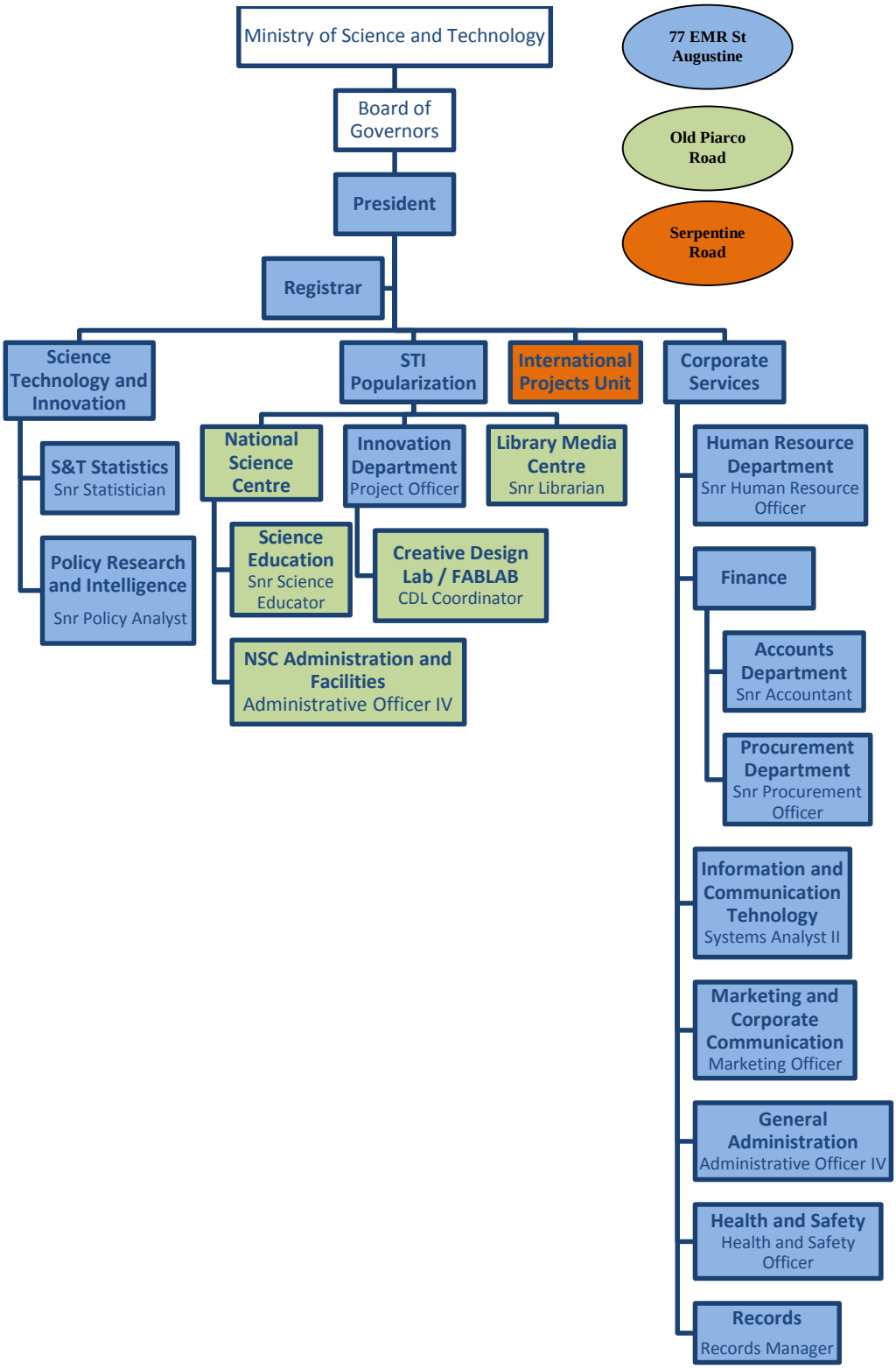
to seed a culture of creativity, inventiveness and entrepreneurship ("technopreneurship"). The department is headed by a Project Officer and operates the Creative Design/FABLAB and Robotics Laboratories at NSC. In April 2015, the Creative Design Lab joined the global FABLAB network of laboratories that support the diffusion of creativity, innovation and invention using 3D design and rapid prototyping. The Innovation Department has a cadre of 11officers.

- 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 the Acting Senior Research Officer and has a complement of 10 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 five officers; (b) finance, which has responsibility for budgeting, finance and accounts, and is headed by the Senior Accountant who supervises three officers); (c) procurement which has a staff of three officers and is headed by a Senior Procurement Officer; (d) ICT (hardware and software support, website, database management, etc.) which has six officers and is headed by the Systems Analyst II; (e) general administration (property and facilities management, security, etc.), which is headed by the above-mentioned Administrative Officer IV, who supervises a staff of 11 officers; (f) health and safety led by the Health & Safety Officer; (g) marketing and communications led by a Marketing Officer and staffed with six support persons; and (h) a 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.

- Office of President and Registrar. The President has overall responsibility for the management of the institute while the Registrar performs the function of Secretary to the NIHERST Board of Governors and such other duties as assigned by the Board. The office has a staff of five officers; two of whom perform monitoring and evaluation.

NIHERST ORGANISATIONAL STRUCTURE



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, oversaw all operations and, in the absence of the Vice President for S&T, oversight was shared 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 Acting President as recommended by the Management Tenders Committee.

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). 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.

Finances

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. Data Protection Act 13 of 2011
b. Industrial Relations Act 23 of 1972, Chapter 88:01
c. Maternity Protection Act, 1988, as amended by No. 7 of 2012
d. Minimum Wages Act 35 of 1976, Chapter 88:04
e. Equal Opportunity Act, 2000
f. Occupational Safety & Health Act, 2004
g. Workmen's Compensation Act 24 of 1960, Chapter 88:05
h. Retrenchment and Severance Benefits Act 32 of 1985
i. NIHERST-PSA Collective Agreement (January 1, 2008 to December 31, 2010)
j. NIHERST-PSA Memoranda of Agreement for cost items for the period January 1, 2011 to December 31, 2013 dated September 18, 2015.

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) 2015 are given in Section 2.2 below.

b) Short, medium and long term plans

During FY 2015, 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 2015, 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 2015

The programmes and initiatives undertaken in FY 2015 maintained the momentum within the three strategic areas cited in Section 3, b above. Key details are presented below in relation to the each strategic goal.

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

1.1 Construction of NIHERST Science City

To recap, 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.

Proposed implementation in two phases 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 provide experiential science learning facilities for developing a population and workforce that is scientifically literate, technology savvy, and innovative. Phase 1 will comprise:

- Main building with exhibition halls, laboratories, kiddie learning and play areas, offices, storage facilities, bathroom facilities and a food court
- Outdoor science park featuring educational and fun attractions with a focus on cutting-edge areas of science and technology
- Planetarium
- Amphitheatre
- Staff and maintenance building.

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 2015

An in-house project team manages the project. The team is led by a Project Implementation Officer and includes a Civil Project Engineer and an Administrative Services Assistant performing technical and administrative duties respectively. The team is supported by two external advisors, one of whom has extensive experience in the fields of Civil Engineering and Project Management and the second with expertise in the field of MEP (Mechanical, Electrical and Plumbing) Engineering. The in-house team manages all aspects of the project, including designs, procurement of all works, goods and services and construction. Activities and works undertaken and the progress attained up to September 30, 2015, are summarised hereunder.

a) Construction and Site Works

i. Contract for the Provision of Boundary Fence - Mc Clatchie Construction Company Ltd was awarded the contract for the boundary fencing in July 2013 and completed the job in February 2015. The shortage of materials (steel rods and wire) was the main cause of the delay in completion.

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. In 2015, the company provided routine site maintenance, which included grass and bush cutting in February 2015 and July 2015.

b) Architectural, Architectural Landscaping & Engineering Designs - The contract for the provision of these 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 Architectural Designs (by Construction Package):

- Site Plan – 100% completed
- Access Road (Road A and Road 1) – 100%
- Wastewater Treatment Plant – 100%
- Lake Package Dam Spillway & Lake Edge Components – 70%
- Phase 1A Building Works - Staff Maintenance Building with Food Kiosk – 100%
- Phase 1 A Ticketing Building -100%

- Phase 1A Site Works – drainage, earthworks, roadworks, external MEP – 40%
- Ancillary Building/Structures – Hydropower, Wind Tunnel, Golf Course, Rope Challenge Course, Main entry, etc. - 45%
- Contract Growing – 85%
- Phase 1A Landscaping & Hardscaping – 60%
- Phase 1B Building Works - Main Building, Exhibit Hall, Workshop, Planetarium - 40%
- Phase 1B Site Works – Drainage, earthworks, roadworks, external MEP -40%
- Phase 1B Landscaping and Hardscaping – 40%.

While concept designs are 100% completed, schematic designs are 70% completed, and detailed designs are 10% completed. The overall completion for Architectural Designs is estimated at 45%.

Status of Engineering Designs:

- Concept Designs – 100% completed
- Design Development - 45% completed.

c) Contracts Awarded: Several contracts were awarded for required professional and other services and these are stated below.

Quantity Surveying Services - BCQS International Ltd, September 2014

Project Implementation Team Contracts – Civil Engineer (November 2014), Project Administrative Assistant (January 2015), and Project MEP Engineer (May 2015)

Subsurface Investigation Services – Trinidad Engineering and Research (1979) Limited, December 2014

Legal Services (FDIC Contracts) – Fitzwilliam, Stone, Furness-Smith and Morgan, April 2015

Construction of Access Road - General Earth Movers Limited, April 2015

Role of FIDIC Engineer for Access Road Contract – BCQS International, May 2015

Consultancy Services for the Science City Ecosystems – Dr Michael Oatham, May 2015.

Promotional Campaign for Science City – Lonsdale, Saatchi and Saatchi for the conceptualisation and execution of a promotional campaign in August and September, 2015 (awarded August 2015).

d) Statutory Approvals

In February 2015, a request was made to the EMA to modify the Master Plan for which the Certificate of Environmental Clearance (CEC) was granted. The EMA granted approval in July 2015.

1.2 Science Popularisation

Through the diverse science popularisation offerings of the **National Science Centre (NSC)**, the institute continued to spearhead the goal of fostering a culture of creativity and innovation propelled by advancements in science and technology. This is a long-term development task, requiring a multi-pronged approach that encompasses early and on-going nurturing of interest in STI and high quality education, which according to global best practice includes complementary, non-informal educational experiences that can inspire students and show science in a real world, relevant context beyond the classroom. There is a key focus in NSC's programme and activities on the development of 21st century skills (i.e. core competencies such as team work, collaboration, digital literacy, critical thinking, problem-solving, communication and decision-making) that would help students to thrive in the modern world.

Situated in D'Abadie and occupying 65,000 square feet of space, **NSC** is home to over 200 interactive exhibits, which educate visitors on topics such astronomy, animation, energy, the climate change, natural hazards, the human body, music, sports and wellness, ICT, robotics, road safety and water conservation. In the Techkno Theatre, visitors of all ages can enjoy entertaining science shows and demonstrations.

The centre offers a wide range of activities and programmes, on-site and off-site, which 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. Non-traditional educational approaches are used to make scientific concepts more comprehensible and captivating to both children and adults, and to show their relevance and application in everyday life. Many programmes also help to popularise ingenuity and to develop the creative and innovative capacity of our citizens.

<u>NSC visitors</u>

For the year under review, 22, 831 persons visited the centre, which represented an increase of 7,578 visitors (50%) from FY 2014. This figure included persons attending general and themed science visits and Astronomy Nights. The majority of the visitors came from St. George East, St. George West and Caroni.

The categories of visitor admissions were as follows-:

Adults with groups (free) – 1,192
Children 5-17 – 13,338
Children under 5 - 2,765
Adults 18 yrs and over - 4,501
Waived admission (needy children) – 1,035.

NSC continued its efforts to create fresh and exciting learning experiences for its visitors, especially the younger age groups through changes its floor exhibits, developing new activities and programmes, and acquiring new teaching resources. NSC also continued to extend its reach and impact on communities beyond its location through outreach events hosted by other agencies or which it organises itself.

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

1.2.1 T.A.P. Into Science 2015

The Centre hosted "TAP into Science" over the period April 21 to April 25, 2015. Held at its base in D'Abadie, the week's activities targeted residents and students of the surrounding communities of Tunapuna, Arima and Piarco (T.A.P.) Twenty-eight agencies participated with NIHERST in this initiative which was similar to the institute's Community Science Week programme that brings science education out of the classroom and into an informal setting where students and citizens are encouraged to explore science exhibits and booths, engage in science demonstrations and other hands-on activities, and actively be a part of their own science learning experience.

A total number of 3,500 students from 53 primary and 18 secondary schools and citizens from across the T.A.P. area attended and had a fun interactive experience of science, and sourced information on careers. Some of the key topics in science and technology included integrated water resource management, food production, agricultural research and development, and information and communications technology. The week also offered workshops on science curriculum topics for students including simple circuits, food chemistry and climate change, in addition to a career forum, cultural entertainment and telescope viewings, which were all well received by visitors.

The Creative Design Lab (CDL) proved to be a popular area of interest among visitors. CDL had five areas on display CAD (Computer Aided Design), CAM (Computer Aided Manufacturing), Electronics (Littlebits), Static Electricity (Van Der Graaf Generator) and Virtual Reality (Zspace). The lab also conducted a robotics workshop for 12 secondary school students.

Of major significance at this event was the official launch of FABLAB (Fabrication Laboratory), an initiative which was a first for Trinidad and Tobago and the region. The setting up of the FABLAB gained CDL entry into the global FABLAB network which enables operational, educational, technical and logistical assistance.

A survey undertaken of "T.A.P. into Science" indicated the following:

- The majority of the participants were completely satisfied with each of the educational areas they visited, which included NSC's exhibits, theatre, library, external exhibitors, and the Centre's facilities and services.
- Almost all (99%) of the respondents indicated that the experience was an enjoyable and interesting one and they would like to return to NSC in the future. Some of the reasons for wanting to return included the engaging educational content of NSC's exhibits and offerings and to visit in particular the FABLAB. Many visitors also indicated that the time spent was too short for them to experience all the Centre had to offer and therefore a return visit would afford them this opportunity.

1.2.2 Caribbean Youth Science Forum (CYSF)

The Caribbean Youth Science Forum (CYSF) presents a unique platform 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. CYSF aims to broaden students' knowledge of science and technology; 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 high quality educational experience encompassing academic, social and cultural activities for their holistic development and for heightening their sense of identity as the region's future leaders in STI.

The core educational components of CYSF are:

- presentations by leading local and international speakers for knowledge on new and emerging technologies that are impacting global development, as well as engagement with these speakers for mentoring and career guidance;
- field trips to research institutions and S&T-based companies where students can see "science in action" and learn about 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.

The forum was held from August 2 - 9, 2015. It received a total of 185 students with 20 students from the islands of Antigua and Barbuda, Barbados, and Grenada and the Grenadines, and the remaining 165 students from 35 schools in Trinidad and Tobago.

During the week, students explored, through lectures/presentations and workshops, issues in fields such as climate change, cardiology, oncology, agriculture, tropical meteorology, climate change, forest ecology, marine biology, forensic science, and architecture.

This year's distinguished visiting keynote speaker was one of Trinidad and Tobago's award winning scientists, Dr Roger Pulwarty, Senior Advisor for Climate and Director of the U S National Integrated Drought Information System at the National Oceanic and Atmospheric Administration (NOAA) in Boulder, Colorado and Washington DC. Dr Pulwarty is also a Professor Adjunct to the University of the West Indies, Cave Hill and the University of Colorado, Boulder. His research and publications have focused on climate, impact assessment, and adaptation in the United States, Latin America and the Caribbean, and he has developed several internationally recognised, interdisciplinary research programmes. He has also service on science advisory committees of the US National Academy of Sciences and was the co-recipient of the 2008 and 2014 NOAA Administrator's awards and the 2010 Department of Commerce Gold Medal for outstanding achievements in integrating scientific research into public decision making. In 2013, he received a NIHERST Awards for Excellence in Science and Technology (Gold). His participation was sponsored by the US Embassy in Port-of-Spain.

Other lectures and presentations were delivered by Dr Lana Boodhoo, consultant caridiologist and electrophysiologist; Dr Reia Guppy, Programme Leader for the BASc in Coast and Ocean Sciences and MSc in Integrated Coastal and Ocean Management at The University of Trinidad and Tobago; and Dr Valery Alexandrov, forensic pathologist at the Trinidad and Tobago Forensic Science Centre; Dr Curt Bodkyn, paediatric oncologist and lecturer in child health at the University of the West Indies. The public was invited to attend special lectures by Mr Jason Renwick, a second year student of the Department of Electrical and Computer Engineering at The University of the West Indies, who received a NIHERST scholarship to attend an International Internship at the NASA Ames Research Centre.

In addition, the participants also enjoyed field trips to 16 institutions to experience the application of STI in the real world of business and industry. The students also visited the National Science Centre and the newly established FABLAB. They were given a demonstration of various robots which included the tactical robot, EV3 system, Cubelets, and Nao Humanoid, and also demonstrations of the Computer Aided Manufacturing (CAM) area in the lab which included the 3D printer, vinyl cutter and the laser cutter.

The participants had the opportunity to have one-on-one discussions with 33 top professionals in the range of STI-related fields at the "Socialising with Scientists" evening which was held at the UTT Graduation Pavilion.

The students were also required to take part in a design challenge in which teams problem solve and innovate under a specified disaster/emergency scenario, which was the sustained loss of electricity for a period of five days after a hurricane. They were asked to design and build a device using only household and/or recycled items/materials that could power small household appliances, light bulbs (florescent/incandescent) or a cell phone using only household and/or recycled items/materials. Another activity entitled "Science Seekers" was an outdoor activity which aimed at equipping participants to handle emergency situations if they were trapped in remote wilderness areas (survival in the wild). The activity required extensive group interaction and cooperative learning, which served to hone skills in leadership, communication, team work, critical and creative thinking, and problem solving. Participants gained useful insights into more effective approaches adopted on trails and were introduced to the latest "high tech" gadgets used in land navigation.

1.2.3 Robomania/Creative Design Labs

NIHERST has been a pioneer in popularising robotics, creativity and innovation across all sectors of the national community. The institute pays special attention to this through its Robomania (robotics) and Creative Design Labs (CDL). The labs deliver a wide range of very popular activities, in-house and off-site, to develop a creative and innovative mindset amongst nationals. In particular, 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.

Robotics, including automation and artificial intelligence, is a key driver of technological advancement and innovation globally and is an area that Trinidad and Tobago needs to build its capacity. Robomania's activities provide students with the real life application of the programming 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.

Electricity and electronic workshops

For the first quarter of 2015, CDL conducted 17 electricity and electronic workshops reaching 375 students of 13 schools in the Central and East school districts. These school districts were chosen based on their distance from the National Science Centre and the interest they had expressed in the participating in the workshop.

The following are the details of the workshops held at schools: -

School	**Date**	**Number of Students**		**Total**
		Boys	Girls	
Carapichaima West Secondary	January 23	4	14	18
Holy Faith Convent (Couva)	January 27	-	21	21
Barataria South Secondary	January 29	30	-	30
Barataria South Secondary	January 30	9		9
St George's College	January 30	18	9	27
Sangre Grande Secondary	February 4	3	17	20
Sangre Grande Secondary	February 5	13	6	19
Manzanilla Secondary	February 6	6	7	13
Chaguanas Secondary	February 10	20	0	20
Cunupia Secondary	February 11	10	9	19
St George's College	February 20	13	14	27
Matura Secondary	February 25	20	3	23
Coryal Secondary	February 26	10	13	23
Coryal Secondary	February 27	11	14	25
Vishnu Secondary	March 4	28	0	28
Vishnu Secondary	March 5	28	0	28
Saraswatie Girls' High	March 17	-	25	25
		223	**152**	**375**

The 1-day workshops consisted of both theoretical and practical activities. The theoretical activities covered several areas such as atomic structure, periodic table, circuits, magnetism, power plants and substations. The practical component afforded students the opportunity to build and gain working knowledge on optical displays, a Van der Graff generator, mechanical pencil point light bulbs, speakers and LED flashers.

Robotics workshops

The Robomania lab conducted outreach workshops from January – March, 2015 at secondary schools located in the north eastern and central school districts. A total of 415 students participated in 17 workshops which were held at 12 secondary schools. The workshops were centred on the Lego Mindstorms EV_3 Robotics Kits. This was the first year that these kits were used in the workshops. Theoretical activities covered topics on several areas of programming, centre of gravity, gear ratio and sensors. Students gained practical experience by building and programming their robotic system to complete a series of actions.

The details of the workshops held at the schools are as follows: -

School	Date	Number of Students		Total
		Boys	Girls	
Carapichaima West Secondary	23 January 23	4	16	20
Holy Faith Convent (Couva)	27 January 27	-	26	26
Barataria South Secondary	January 29	26	-	26
Barataria South Secondary	January 30	23	-	23
St George's College	February 2	11	10	21
Sangre Grande Secondary	February 4	14	6	20
Sangre Grande	February 5	21	7	28
Manzanilla Secondary	February 6	4	15	19
Chaguanas Secondary	February 10	24	0	24
Cunupia Secondary	February 11	13	13	26
St Georges' College	February 20	14	10	24
Matura Secondary	February 25	21	15	36
Coryal Secondary	February 26	11	14	25
Coryal Secondary	February 27	10	13	23
Vishnu Boys' College	March 4	28	0	28
Vishnu Boys' College	March 5	28	0	28
St George's College	March 6	11	7	18
		263	**152**	**415**

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

- T.A.P. into Science Week
- Girls in ICT - Telecommunications of Trinidad and Tobago (TATT)
- Caribbean Youth Science Forum (CYSF).

Launch of FABLAB

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. NIHERST created a new platform for innovation and invention with the upgrade of the Creative Design Lab to a proper FABLAB (Fabrication Laboratory) under the Global Network of FABLABs curated by the Fab Foundation at MIT's Centre for Bits and Atoms. The FABLAB was officially launched on April 20, 2015 at the beginning "T.A.P. into Science" week. The launch also coincided with the global celebration of World Creativity and Innovation Week.

The lab, the first of its kind registered in Trinidad and Tobago and in the region by the Fab Foundation, provides affordable access to tools and resources for education, innovation, and professional development. It will help creative citizens see their idea move from the idea stage to the creation of the product as the lab offers local inventors and innovators the facilities to

design and 3D print working prototypes at a fraction of the cost of traditional prototyping and product development. The FABLAB also hosts design and development workshops for the public and in particular secondary and tertiary level students.

In August, 2015 a World Bank delegation toured the FABLAB, the purpose of which was for the Nicaraguan members of the contingent to gather information on the setting up and operation of the lab with a view establishing a FABLAB in their home country.

1.2.5 Vacation camps in Science, Technology, Innovation and Invention

NIHERST continued in its efforts to offer an expanding range of camps during the July/August vacation and it reintroduced in 2015 Easter vacation camps. This initiative proved to be a very successful one. The camps target youngsters between the ages of 5 and 17 in an effort to continue and broaden their science learning outside of school with high quality, hands-on experiences of science and cutting-edge technologies. The camps explored 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 science content that students 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. The camps are oversubscribed, with parents requesting longer sessions and more camp venues around the country. Thus in response, the number and duration of camps have been expanded as resources permit. In FY 2015, a total of 1,372 children (21% increase from FY 2014) took part in the institute's highly interactive camps.

Science Easter Camps were conducted by the Innovation Department for children 5 – 16 years old. Four camps were held at the National Science Centre from March 31, 2015 to April 10, 2015. A total of 80 children attended. The breakdown in numbers is as follows:

Camp	**Age Group**	**Attendance**
Wild Science	5-7 years	35
CyberKids	7-12 years	20
Maker Camp	12-17 years	17
RoboTech	12-17 years	17
		89

The Wild Science camp activities included teaching campers how apply scientific principles to survive in the wild and in the Cyber Kids camp, children were taught the use of Scratch Software programming to interact with MaKey MaKey™ devices and LEGO® WeDo™ construction kits. In the Maker Camp, children learnt how to prototype with CAD and CAM machines using 3D printers and laser cutters. The children who participated in the Robo Tech camp got a firsthand experience in designing, building and programming intelligent robots using Lego® Mindstorm® EV3 kits.

Two-week long **Funology** and **Explorer** camps, hosted by the Innovation Department, expose children to science, the arts, creativity and innovation. The cmaps are held over the July/August vacation, and cater to children 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. In 2015, Funology had as its focus "Art in Science". Campers used the power of a pendulum to create their own colourful masterpiece. They learnt: how engineers incorporate symmetry and art into the structures they build; how to sculpt; how to create their own optical illusions; and how to make their own paper and to create Origami flowers. The Explorer had as its focus Oceanic Exploration and Biomimicry. As Junior Marine Biologists, campers investigated the biodiversity of the deep blue sea, its unique geological features, the ocean's tides and currents and the mysterious animals of the deep. Inspired by nature, their creativity was tested in Biomimicry Challenge in which they had to conceptualise and develop a new technology influenced by nature. The details of camps are given below.

FUNOLOGY CAMP			
Venues	**Dates**	**Camp Attendance**	**Topics**
COSTAATT, Port of Spain	July 6– 17	45	• Pendulums • Symmetry • Optical Illusions & Colour • History of Paper & Origami • Engineering and Product Design • Landscape Engineering and Art • Sculpting

EXPLORER CAMP			
Venues	**Dates**	**Camp Attendance**	**Topics**
COSTAATT, Port of Spain	July 6– 17	45	• Geography and plate tectonics • Oceans & Ocean Zones • Ocean Tides, Waves and Natural Disasters • Marine Life • Biomimicry (Animals & Plants) • Entrepreneurship
Preysal Secondary School	July 20-31	40	
UTT Campus, San Fernando	August 10– 21	60	
		145	

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 Preysal Secondary School. In the Robomania camps, participants learnt how to build a basic robot using the Lego Mingstorms EV3 kit; the basics of how robots work including an introduction to sensors, servos and controllers; to program a robot using the EV3 programming software and onboard programming utility; to build and modify a midrange remote control robot using the VEX robotics kits; and to work in teams to complete competitive tasks. In addition to obtaining a good introduction to robotics in general, participants got an appreciation for the academic fields that it entails viz. physics, computer, engineering and electronics. The hope is that this will encourage them to want to pursue sciences in secondary school and careers in these STEM fields.

Campers had to undertake problem-based learning projects each week as follows:

- Week 1: Build Challenge (Ball carrier obstacle course) - MAD MAX Bumpy Road (using Lego Mindstorms EV3 kit)
- Week 2: Programming Challenge (Ball transporter) - Methods of Transportation (using Lego Mindstorms EV3 kit)
- Week 3: Remote Control Challenge - Battle Bots (using VEX Robotics kits).

The total intake in these camps was 90 participants. The breakdown across venues is given below.

ROBOMANIA		
Venue	**Date**	**Camp Attendance**
NSC	July 6– 17	30
Preysal Secondary School	July 27– August 7	30
UTT Campus, San Fernando	August 17– 28	30
		90

The **Young Inventors** camps for 2015 covered four topic areas:

- Electronics, which introduced the basic concepts of electricity and its application through the use of a user friendly electronic library (LittleBits);
- Computer Aided Design (CAD), which gave campers hands-on experience with the digital design (2D & 3D) process through the use of the AutoCAD software;
- Computer Aided Manufacturing (CAM), which showed the process of converting a digital design into a physical prototype (Epilog Laser Cutter, Makerbot 3D printer); and
- Technopreneurship, which looked at how technology and entrepreneurship can be used to create an innovative business solution or venture.

Participants acquired a basic understanding of the concepts and gained practical skills in electronics, CAD, CAM, digital fabrication, creative thinking, innovation and invention, and S&T-driven entrepreneurship. They also learnt about team work, creative thinking and problem solving, and the efficient use of materials in executing their projects. In addition, participants also gained an appreciation for the disciplines of physics, computer science and engineering in the hope that would be encouraged to pursue studies and STEM careers in these fields, all this whilst having fun and enjoyment in the process of learning. Visiting facilitator and master craftsman, Mr. Frank Wuenstel demonstrated the possibilities of digital fabrication and used this information, under his guidance, to create a solution to a problem their group selected to work on.

The total intake in these camps was also 90 participants. The breakdown across venues is given below.

YOUNG INVENTORS		
Venue	**Date**	**Camp Attendance**
NSC	July 6 – 17	30
Preysal Secondary School	July 27 – August 7	30
UTT Campus, San Fernando	August 17– 28	30
		90

The computer-based **Tech Camps** offer engaging technology-centred activities for each age group, Juniors (ages 7-9 and 9-12) and Seniors (ages 13 -17). The camps were run back-to-back

with some overlaps at the National Science Centre over the July - August period, with two camps (GrafX and eMagination Level 1) being held at both NSC and UTT San Fernando. In addition, a new camp Computer Constructors was offered at the NSC venue.

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). The seniors worked with Adobe Illustrator and Photoshop to create and edit graphics for websites and flyers; Android App Development to create mobile apps for devices running on the Android platform including tablets and smartphones; 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, third-person computer game. They also used Dot.Com to learn HTML5, JQuery and CSS to create their own responsive websites. Computer Constructors allowed students to understand the role and function of the different parts that make up a computer system and students got the opportunity to learn how to build their own computers.

Camp	**Dates**	**Camp Attendance**
e-Magination L1a- NSC	July 6– 10	22
e-Magination L1b – NSC	July 20– 24	21
e-Magination L1 – UTT, San Fernando	August 10– 14	20
e-Magination L2a NSC	July 13– 17	21
e-Magination L2b NSC	August 27– 31	21
Computer Constructors	August 3– 7	23
GrafX NSC	August 10– 14	23
GrafX UTT, San Fernando	August 17– 21	18
Dot Com NSC	July 13-17	22
App Builders NSC	August 3– 7	18
Gamerz World NSC	August 17-28	20
		229

Sci-Spy and Eureka camps hosted by NSC's Science Education Unit 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 science content.

In 2015, both camps were attended by a total of 584 children. The two-week long Sci Spy camps (ages 7-11) were run for three cycles and shorter one-week Eureka camps (ages 10-12) were held for six weeks. Sci Spy had 240 campers and the topics covered in the camps were as follows: -

- MathemARtics (Geometry through Art)
- Civil Engineering Inc.
- Brain Games (Brainteasers/Neuroscience)
- Get Green! (Green technology/architecture/agriculture)
- Young Vets (Veterinary Science)
- Special FX (Cinematography)
- Go Micro (Microbiology)
- Private Investigator (CSI & Forensics).

Eureka had 344 campers and the camps covered the following six (6) topics: -

- Being a Scientist
- Science Dramatics
- Discover the Universe
- Toyology or Mathemagic
- Science Spoilers
- Green Tech.

1.2.6 Clubs

The various clubs run by the Innovation and Science Education Departments provide opportunities for students (ages 7 - 16) to form a positive attitude towards science, technology and innovation; expand and deepen their knowledge of scientific concepts as applied to daily life; reinforce concepts taught in the 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: introduction to flight science, history of aviation, Bernoulli's Principle and Resistance, electricity and magnetism, and a career in science with the focus on forensic scientist, food chemist,

material scientist, engineer and physicists. The lesson objectives and pedagogical strategies were adapted to suit the developmental and learning needs of the various age groups.

- *Sci-Eng Club*: This club is held at Debe High School. In 2015, the club had a membership of 35 students drawn from the host school and other schools in the area. The club members learnt about the basic principles and applications of mechanical engineering and engaged in practical activities which included assembling a gear box and another project to assemble four mechanical legs.

- *Robomania Club***:** In 2015**,** the 18 club members built and programmed robots using the EV3 software with a view to having members gain in-depth knowledge of the various components that a factory assembly line utilizes to make its operations more efficient.

- *Tech Club:* This new club was launched in April 2015 at NSC and NIHERST office in St. Clair with a membership of 41 Junior members (ages 7-12) and 32 Senior members (ages 13-17). The first cycle of activities ended in June. This club was set up to expose students to the basics of computer science by teaching them to create technical solutions, including apps, games and websites that help to solve a regional problem. Junior members learnt about the creation and sharing of animated local stories and interactive games. They used MaKey MaKey and Lego WeDo kits to manipulate physical objects (circuit boards, pulleys, toy cars, toy helicopters, etc.) in the real world via computer codes. Senior members learnt how to create different types of mobile apps (information driven, games, forms, etc.) and deploy them on their android devices.

1.2.7 Astronomy Nights

Astronomy Nights were held from January-April, 2015 at NSC. This activity is popular with families with children, and attracted 1527 patrons as follows: January 23 (549 visitors); March 20 (688 visitors); and Yuri Night, April 10 (290 visitors). The activities for the night included the telescope viewings and a series of STEAM-based activities such as workshops, interactive exhibits, science shows and fun games, all designed to help develop 21st century skills. For the younger children, the activities are heavily art based and included story-telling, pictionary, a jeopardy board game, outdoor movies and cosmic kitchen. In addition to Astronomy Nights, the telescope viewings held at the T.A.P. into Science Week were well received by visitors.

1.2.8 Community-Centred Design and Innovation (COMDESI)

Based on the EPIC programme of leading US universities (notably Purdue University), the COMDESI project provides students of forms 2-4 with an educational experience in working 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 leadership, 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 a problem in their environment, 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.

In March 2015, students from seven (7) secondary schools - Bishop's Centenary College, Bishop's Anstey High School East, St. Augustine Girls' High School, North Gate College, Trinity College (Moka), Parvati Girls' Hindu College and Woodbrook Secondary School - signed up for the programme. Owing to difficulties experienced by some of the schools only 22 students of four (4) schools, namely Bishop's Anstey High School East, North Gate College, Parvati Girls' Hindu College and Woodbrook Secondary School, completed the programme to the final stage of judging.

The students attended weekly training and mentoring sessions held on their school compound with NIHERST staff on civic engagement, teamwork and leadership, innovation, invention and prototype development, leadership and report writing/presentation techniques. These sessions were designed to assist them in the preparation for their final project. The students were required to attend a two-week workshop during the Easter vacation where they gain in-depth knowledge on the COMDESI programme and the topics of entrepreneurship and sustainability. They also engaged in brainstorming and problem solving sessions and received training and practise in interview skills and report writing and presentation and were introduced to the basics of computer-aided design CAD and computer-aided manufacturing (CAM) using AutoCAD software, and 3D printing and other resources at NIHERST's newly installed FABLAB.

Working in teams, the participants were given the challenge to observe their school compound for any faults or potential problems with a view to formulating an action plan for finding a solution and then building and testing a prototype. They were required to interview their school mates to solicit their opinions on the same. From their observations and interviews, they were required to journal important details to aid in the design and building of the prototype. They then crafted and built their innovative ideas on weekdays and Saturdays during the school term. The projects/solutions submitted were judged and all students received a participation prize.

At the ceremony, which was held on October 3, 2015 at the National Science Centre, Parvati Girls' Hindu College was adjudged as the overall winners and North Gate College was given a special prize. All students received certificates of participant. The participating 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. The details of the schools' entrants and projects are presented below.

School	**Team**	**Project Challenge**	**Project Title**	**Project Description**
Parvati Girls' Hindu College	Mary Pope, Maria Pope, Nadira Chadee, Niema Rahaman, Leian Seepersad	To make new and existing students aware of school activities, rules, buildings, etc.	A Journey Through PGHC	Sawara, a board game that is designed to orient new and existing players to the school's rules, activities, buildings, etc.
North Gate College	Kai Fairman, Zachary Joel, Jenae Edwards, Yuying Jiang, Krista Kallicharan	To reduce flooding in the school's main field	Modified water pump	The design of a pump that will allow water which settles in the drain and causes flooding to instead flow freely along the drains
Bishop's East Anstey High School	Tishara Aaron, Jelise Besson, Sherlissa Ali-Thompson Sophia Lezama, Gabriel David Ziona Alexis, Phillicia Aaron	To reduce the number of mosquitoes breeding on the school compound by making water flow freely in the drains located at the back of the school compound where water is pooling and becoming stagnant	Water Turbine	The construction of a turbine that spins and therefore makes the water flow along the drains

School	Team	Project Challenge	Project Title	Project Description
Woodbrook Secondary School	Tyrese George, Jeremy Stewart, Kemba St. Rose Jelice Farell Shaina Yaerwood	To alleviate the problem of littering on the school compound	Basketball Bin	The design and construction of a usual basketball bin which includes an innovation of a back board which retains garbage which would not have landed in the bin

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. In FY 2015, NIHERST participated in 19 events which benefited 11,188 visitors, mainly children. This numbers represents a 5% over the 10,600 visitors served at outreach in FY 2014.

Outreach Activities, 2015

Event	Date	Area	No. of Visitors	Goals of NIHERST Exhibits & Activities
Tobago Science Expo- THA	September 26– October 4	Tobago	1000	To improve scientific literacy in community
Americas Competitiveness Forum- Min. of Planning & Sustainable Development	October 9– 11	Port of Spain	1500	To showcase innovation in development
Lakshmi Girls' Hindu College Science Fair	October 15	St Augustine	400	To provide an engaging experience as students improve their understanding of science concepts

Event	Date	Area	No. of Visitors	Goals of NIHERST Exhibits & Activities
North Eastern College, Science Fair	November 16	Sangre Grande	200	To demonstrate the application of ICT in leisure and entertainment using Virtual World exhibits
Christmas Children's Party at Diplomatic Centre	December 16	Port of Spain	200	To provide a fun hands-on experience of science and technology for children
Adolescent Intervention Program, Siparia Union Presbyterian – Min. of Gender &Youth Affairs	May 21	Siparia	65	To encourage post SEA students to take interest in science and its importance to everyday life To demonstrate exhibits that engage their attention in problem-solving and decision-making whilst having fun and enjoyment
Adolescent Intervention Program, St. Christopher's AC Primary – Min. of Gender &Youth Affairs	May 28	Siparia	34	To demonstrate and explain three Robotic systems:- a) NAO Humaniod Robot- to showcase an advancement in robotics while still providing a platform for student learning and excitement b) Cubelets- to provide a practical example of how modular programming works in action c) VEX robotic system- to provide students with an opportunity to use a remote controlled robot (ROV) and show the importance of the mechanical ,electrical and computer based systems in a real world application (search and rescue)
The Knowledge Fair- UWI, Arthur Lok Jack Graduate School of Business, GEF, UNDP	May 28-29	Mount Hope	400	To educated on Aquaponics as a means of food security
Atlantic LNG Biodiversity Fair	June 1-3	Point Fortin	3000	To educate residents of this community about different concepts in science and technology using fun interactive exhibits and activities

Event	Date	Area	No. of Visitors	Goals of NIHERST Exhibits & Activities
Adolescent Intervention Program, Anstey Memorial Girls' Anglican Primary School – Min. of Gender & Youth Affairs	June 8	San Fernando	47	To demonstrate and explain: a) NAO Humaniod Robot b) Cubelets c) VEX robotic system as described above
Adolescent Intervention Program, Coffee Boys' Anglican School Min. of Gender & Youth Affairs	June 9	San Fernando	20	To demonstrate and explain 3 robotic systems a described above
Adolescent Intervention Program, St. Stephen's Anglican Primary School –Min. of Gender & Youth Affairs	June 10	Princes Town	50	To conduct interactive sessions to encourage participants (post SEA students) to take interest in science and its importance to everyday life To demonstrate exhibits that engage students' attention in problem-solving and decision- making whilst providing fun and enjoyment in the process
Adolescent Intervention Program, Deyanand Memorial Vedic Primary –Min. of Gender & Youth Affairs	June 11	Penal	60	Same as above
Adolescent Intervention Program-Princes Town Methodist Primary School – Min. of Gender & Youth Affairs	June 11	Princes Town	50	Same as above
ICT for Seniors – Min. of Science and Technology	July 22	Port of Spain	500	To educate senior citizens about various kinds of information and communication technologies (ICTs)
Project Management Institute-For a Sustainable World	September 22-23	Macoya	600	To showcase the functionality and benefits of rainwater harvesting To promote NIHERST services and activities
UWI Research Expo	September 22-25	St. Augustine	2000	To link selected exhibits to the advancement of knowledge in science and technology To encourage researchers to join the Science and Technology Research database

Event	Date	Area	No. of Visitors	Goals of NIHERST Exhibits & Activities
Eastern Regional Authority-Health Fair	September 25	Rio Claro	1000	To provide exhibits that educate on a balanced diet and the consequences of unhealthy foods and eating habits

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 awards for Junior Scientist and Junior Engineer aimed at persons under the age of 35 with exceptional abilities and achievements. The awards, which are named in the various fields after some of our local icons, are as follows:

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

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 and are sold to members of the public. They are often the only detailed biographical material available on the scientists featured.

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. Twenty-eight nominations were received. Judging was undertaken by an international panel of five experts and completed in November 2014.

Following the judging, a gala awards function to celebrate the 2014 Awards for Excellence in Science and Technology was held on January 10, 2015 at the Hyatt Regency Trinidad. The keynote address entitled "Innovation through Collaboration and Interdisciplinary Research" was presented by Professor Patrick Hosein, Professor in Computer Science at The University of the West Indies, St Augustine. At the ceremony nine (9) awardees were honoured.

Gold Medal Awardees

The Rudranath Capildeo Award for Applied Science and Technology
Professor Michael Fisher

The Emmanuel Ciprian Amoroso Award for Medical Sciences
Professor Anthony Kalloo

The Fenrick De Four Award for Engineering
Professor Clement Imbert

The Frank Rampersad Award for Junior Scientist
Dr Naila Murray

Silver Medal Awardees

The Julian Kenny Award for Natural Sciences
Dr Judith Gobin

The Fenrick De Four Award for Engineering
Dr Chitram Lutchman
Dr George Sammy

The Frank Rampersad Award for Junior Scientist
Ms Xsitaaz Twinkle Chadee
Dr Snehal Pinto Pereira

In 2015, work continued on the writing and editing of the *Trinidad and Tobago Icons in Science and Technology Volume 4* publication. It will feature interviews of the 18 awardees of the 2013 Awards for Excellence in Science and Technology.

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. The competition is judged in two age categories Junior (13-17) and Senior (18 and over).

In FY 2015, there was an increase in the number of entries from 254 received for the 2013 awards to 500 entries. Strategic partnerships were forged with three agencies, Caribbean Industrial Research Institute (CARIRI), the Intellectual Property Office and the National Entrepreneurship Development Company (NEDCO). These agencies assisted with providing relevant information, workshops and technical assistance to the entrants. Some of the inventors were used the NIHERST FABLAB facilities in the creation of their inventions and innovations. Of significance in the year's competition was that twelve (12) entrants began the patenting process for their inventions and innovations at the local Intellectual Property Office (IPO)

A total of seventy one (71) entries, comprising of both individual and team entries, made it to the final stage of selecting the top winners in each award category. The awards ceremony was held on August 24, 2015 in the Port-of-Spain Ballroom of the HYATT Regency Hotel & Conference Centre. A total of 101 persons were awarded prizes. The top three places are presented below.

Scientific Innovation & Invention Competition
Senior Category
1st Place Eesa Wahid – *Constant voltage high lithium battery*
2nd Place Nicholas Cyrus – *Multi-Que Barbeque Grill; Arched Gate Guiding & Track System*
3rd Place Andrea Kanneh, Georgette Medford, Barry Soodeen, Debra Paponette - *Machine for Cutting of Masonry Wood and Other Materials*

Junior Category
1st Place Denika Hercules, Lexie Jaggernauth, Patti-Ann Timothy - *Portable Solar Powered AC Unit*
2nd Place John Ahloy, Jesse Emamalie – *Trini Taxi App*
3rd Place Arthur Goddard – *Seeker (Education Network)*

Scientific Creative Solutions Competition
Senior Category
1st Place Natasha Ramroopsingh – *A novel biosensor for detection of Thyroid disorders*
2nd Place Ruissein Mohan – *Future Wealth of Trinidad and Tobago*
3rd Place Nizette Edwards, Athanasios Karamalidis – *Fate of Biocides in Produced Water*

Junior Category
1st Place Shamiya Charles – *The Ultimate Fruit and Vegetable Vendor Stand; The Ultimate Portion Controller*

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

Strategic Goal 2: Research & Intelligence Gathering

A key strategic goal of NIHERST is to strengthen its research and intelligence gathering capability to better support economic diversification through clear policy direction supported by data and strategic foresight. In FY 2015, NIHERST continued to make 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), which initiated strategic sectoral innovation mapping studies and provides policy support and advocacy in developing a national STI policy; and
- the establishment of 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. Annual S&T statistical data and the key findings of the completed surveys are uploaded onto the S&T Statistical Research page on the NIHERST website. The page received 16,579 hits over the reporting period.

During the reporting period, the studies undertaken by the S&T Statistical were designed to measure the science, technology and innovative capabilities in key industries in Trinidad and Tobago and to support the development of science education in the country. The unit published the results of the Survey of Secondary School Middle Form Students, 2014. This study 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 continued with the Survey of Mechanical Engineers, 2014 which also stemmed from the institution's participation in the OAS Working Group 2. Two new surveys were also launched in 2015: Survey of Science in Primary Schools, 2015 and Survey of Innovation in the Textile, Garment, Headwear and Footwear Industry, 2015. The unit also conducted its annual survey of Science and Technology Indicators in 2015. The details are as follows: -

1. Survey of Secondary School Middle Form Students, 2014

This was an enquiry of form 3 students (middle form students) in government, government-assisted and private secondary schools. The study focused on form 3 students because at this juncture in secondary education, students usually select appropriate CSEC subjects to pursue their future career. The major objective of this study was to compile benchmark data on students such as their desire to further their studies, factors that influence students' decision to study, their opinion and choice of scientific careers, and their reasons for pursuing/not pursuing careers in science and technology. The study also examined students' attitudes towards science and technology and activities in science and mathematics classes. A report on the results of this study was published in January 2015.

2. *Survey of Mechanical Engineers, 2014*

The 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 are intended to assist decision-makers, researchers, educators, employers, and, in general, stakeholders in mechanical engineering education and professional development. Data gathered are being analysed and will be published upon completion.

3. *Survey of Science in Primary Schools, 2015*

This survey is the follow up to a similar study conducted by NIHERST in 2003. This undertaking was designed to provide empirical data on the teaching of science in primary schools and has generated essential indicators for comparisons with similar studies. The survey was a two-part enquiry of principals and of teachers in Standards 1 – 5 in each of the selected government, government assisted and private primary schools. The major objectives were to compile data on the profile of primary school principals and teachers including teachers' training needs and difficulties encountered in teaching science. The adequacy and availability of school infrastructure and support systems available for the teaching of primary school science were also addressed in the enquiry.

4. Survey of Innovation in the Textile Garment, Headwear and Footwear Industry, 2015

This study focused on business establishments in the textile, garment, headwear and footwear 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 will provide insights into the innovation process in this industry and will assist decision-makers in developing policies to create the environment and incentives to foster innovation and economic growth. The results are being analysed and will be published in the second quarter of 2016.

5. Survey of Science and Technology Indicators, 2015

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 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) for FY 2015 was as follows: -

Draft National Science Policy

The draft national science policy was completed and discussed extensively by the NIHERST Board in September 2015. Some revisions and further research were requested before submission to the line ministry.

The draft document was comprehensive and aligned with the goals of the Medium Term Policy Framework (MPSD, 2011), and in particular its goals to transform Trinidad and Tobago into an innovation-driven economy. The draft policy document highlights that this transformation requires not only a change in the national mindset but widespread structural transformation harnessing inter alia science, technology and innovation (STI). It identifies that the challenges to harnessing S&T for transformation include:

- the absence of clear policies and strong linkages to guide the knowledge-generating activities of educational and research institutes with the knowledge needs of industry, which has resulted in a poorly functioning innovation system;
- limited and fragmented public and private funding for research and development (under 0.05% of GDP, 2010);
- a limited stock of researchers in STI to solve problems arising in industry, academia, and the society;
- a mismatch of STI human resources in relation to the needs of society and industry;
- deficiencies at all levels in STEM education, especially as regards mathematics, problem-solving, critical thinking, and innovation aptitudes;
- brain drain that exacerbates STI human resource deficiencies; and
- a weak system of governance resulting in the lack of a clear delineation of the roles and responsibilities of various actors and institutions operating in the STI system with resultant institutional gaps and overlaps.

The draft policy outlines four (4) key objectives as follows:

- Growing critical inputs: Sustaining increases in public and private expenditure on research and development accompanied by an enabling infrastructure that supports research and connects the work of researchers with productive actors

- Supporting the development of human capital in science and technology: Generating critical mass of researchers, scientists, technicians, technologists and engineers and equipping them with the relevant tools, and skills to solve problems arising in industry and society

- Strengthening coordination, collaboration and governance: Developing synergies and mechanisms that foster better coordination and collaboration among stakeholders resulting in the following outcomes:

    - Increased access to technologies that facilitate efficient production

    - Technology transfer initiatives

    - A greater role for S&T advice in the development of public policy since S&T cuts across all fields of endeavour

    - Increased exchanges between local and international scientific communities.

- Increasing national benefits from S&T: Facilitating the generation, adaptation and application of technologies and solutions to effect positive changes in national priority areas such as Food Production and Sustainability, Crime Reduction, Environment & Energy Sustainability, and Public Health and Wellness.

Two critical policy prescriptions are the: Establishment of coordinating body that works towards strengthening the link-ages among the STI actors in the system, and the Establishment of a National Science and Technology Fund to support the growth of critical S&T inputs (basic and applied research, human capital development and product and process innovations) in set priority areas. Other significant recommendations are the Development of research clusters linked to industry and societal needs; Support by the Ministry of Science & Technology for the Ministry of Education and the Ministry of Tertiary Education and Skills Training to address the challenges in delivering STEM education (actions include stronger academia and industry linkages and support for the elevation and strengthening of opportunities for post doctoral research and training); and Facilitating collaboration with the T&T's scientific Diaspora including creating a virtual community for the sharing of knowledge. Given that S&T impact many matters of public interest, it is proposed that the inclusion of scientific advice be made available and used by various bodies in government. The advisors will provide technical information on major national

issues, future scenarios, and feasible policy options coupled with the accompanying ethical considerations of such options.

The Chairman and key officials of the line ministry held discussions on the draft policy at which it was agreed that the document should be condensed and re-positioned. A final document was presented by the Chairman to the ministry in August 2015 and the ministry began work on an implementation plan.

Sectoral Innovation Mapping (SIM) Exercises

Steady progress was made on the mapping of the innovation systems of the Energy Services sector and relevant subsectors of the ICT sector, namely Animation, Software Development and Web Development. As NIHERST and other key government agencies have acknowledged, these SIM exercises are critical in providing an evidence-based platform on which government can base its policies towards the diversification of Trinidad and Tobago's economy. The work which was completed and in now at an advanced stage included:

Energy Services: Data collection from more than 42 key stakeholders in the sector. A draft mapping document is near completion for Energy Services and the feedback report is underway.

Animation: Primary data collection has been completed for the Animation sub-sector, and a draft final mapping report of the sub-sector is being finalised, while the policy recommendations based on the exercise's findings are being refined.

Software Development and Web Development: Significant progress has been made in primary data collection for software and web development industries, as there is a substantial degree of overlap between the two sub-sectors. However, a few key stakeholders in these industries still remain to be interviewed.

Information Brief for the National Delegation to the High Level Meeting of the CARICOM Science, Technology and Innovation Committee (CSTIC)

Briefing notes were prepared for the Minister of Science in preparation for the above-captioned meeting. The brief highlighted critical current issues and articulated Trinidad and Tobago's position on the topics of innovation as the key to economic growth, the development and funding of S&T infrastructure for innovation, the status of S&T in CARICOM countries and highlighted interests and concerns. The brief also included proposals for establishing a basic infrastructure.

ICT Policy Framework Development Committee

From August 2014 to September 2015, the PRI Department represented NIHERST on the monthly meetings convened by the above-mentioned committee. The aim of the committee was to review, discuss and refine a series of standardised guidelines for policy-making in the Information and Communication Technology (ICT) space within Trinidad and Tobago. In September 2015, the committee successfully completed and finalised a draft document entitled *Guidelines for Policy Development and Management*. The committee comprised representatives from the Telecommunications Authority of Trinidad and Tobago, and the National ICT Company of Trinidad and Tobago (iGovTT), as well as the Ministry of Science and Technology.

Data Collection for Status Report on Initiatives Relevant to Draft Implementation Plan for the Regional Digital Development Strategy

The Department made detailed input to this initiative, specifically in the following areas:

- Capacity Building: To build a digital community culture and increase the value and volume of the region's trained ICT workforce that can create, develop, and use ICT to improve lifestyle and otherwise add personal and economic value;
- Information Management, Local Content and Media: To establish a culture of innovation and quality and to enable sustainable production of regional digital goods and services, the development of cultural industries and the inclusion of local content in the delivery of information; and
- Functional Cooperation: To guide business and governments to use ICT for sustainable growth and support social development objectives through partnerships that use networked technologies.

Provision of Input in Relation to the Development of a Broadband Policy Toolkit for Latin American and the Caribbean

The Department compiled and synthesised inputs from various departments within NIHERST to provide harmonised responses for the above-captioned exercise, a joint initiative with the Inter-American Development Bank (IDB) and the Organisation for Economic Co-operation and Development (OECD). The thematic areas of this exercise were as follows: -

- Affordability Issues and the Role of ICTs for Development: Barriers to increased take-up of ICTs included low ICT awareness, digital competency, data security concerns, and inequality of access to telecommunications.
- ICT in Industry, Innovation and Entrepreneurship: Industry challenges were identified, including infrastructure, lack of electronic payment systems, access to

financing, legislative deficiencies, security and privacy, IP rights and lack of critical mass in human resources.

Comments on the 2nd EU-CELAC Academic Summit

The Department submitted comments touching upon issues affecting the relationship between industry, academia and government within Trinidad and Tobago as well as CARICOM. Issues of note included the mismatch of tertiary-level curricula to the needs of industry in some sectors, challenges graduates face in transitioning from academia to industry, a lack of available or accessible data for research, cultural differences between academia and industry, the need for systemic incentives for private investment in R&D, and challenges in disseminating research to the wider population.

Representation and submission of completed questionnaire at the Global Research Council of the Americas

The Department Head attended the Third Regional Research Council of the Americas Meeting held in Lima, Peru. The topics under discussion included "Research Funding for Scientific Breakthrough" and "Building Research and Education Capacity". A questionnaire highlighting the good practices carried out within programs administered in Trinidad and Tobago and prepared along the lines of the key themes was prepared by the Department.

Contribution to the Multiannual Indicative Programme 2014 – 2020

The Department has assisted the Ministry of Planning in making contributions and provided considerable feedback to the documents prepared for the captioned programme which focuses on the topic of innovation.

Representation on the Steering Committee for Innovation at MOP

The Department served on the above committee and made contributions to various draft documents inclusive of:

- TOR for Trinidad and Tobago Consultancy for Innovation Survey for National Innovation Policy;
- PROTEqIN Innovation Survey Instrument conducted by the Arthur Lok Jack Graduate School; and
- Assessment of the National Innovation Ecosystem.

2.3 National Science & Technology Database - STResearchTT

In May 2015, NIHERST launched the national science and technology research database STResearchTT with the aim of advancing local research and developing (R&D) and innovation. STResearchTT provides a database of researchers and research institutions that currently exist nationally and documentation on the research activities undertaken by public and private institutions in Trinidad and Tobago. This database is a key aspect of the country's STI infrastructure which will provide access to biodata on Trinidad and Tobago researchers and their research interests in an effort to give greater visibility to the capacities of research professionals and to stimulate more interdisciplinary research efforts. It will also facilitate greater collaboration both nationally and internationally among scientists, research institutions, the productive sector and civil society. It is anticipated that this will encourage local innovation and scientific achievement. 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 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. Details on collaborative projects undertaken in 2015 are presented below.

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 prestigious internship programmes and workforce preparatory experience for STEM careers. It provides a collaborative environment in which 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 local interns were attached to the NASA Ames Research Center (ARC) in California.

Work on promoting the programme and selecting candidates for the 2015 internships started in December 2014. 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. Applicants were required to choose a research topic from the fields of Water Recycling, Space Debris Mitigation/Planetary Defense, Space Biology/Metabolism, Small Satellite and Submersible Technologies, Nanotechnology, Machine Learning and Data Mining, Intelligent Systems Division, Code TI and Prognostics and Health Management.

Thirty six (36) applications were received and screened by a panel that 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.

In the second stage applicants were short-listed to seven (7) 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 2015 internships.

Mr Inzamam Rahaman and Ms Asher Williams were awarded the internship. Mr Jason Renwick and Mr Stefan Hosein, the first interns, excelled in their research projects and were asked by NASA Ames Research Centre to return there to continue their research. Mr Renwick was the winner of the 2015 Ames Honour Award from the NASA Research Centre in California. All four interns did public lectures and talks to students to share their experiences and disseminate knowledge about their research projects. Their work is also featured on NIHERST website.

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 2015, 13 candidates from the Port of Spain and Caroni educational districts applied. Felisha Jones from St. Francois Girls' College and Mark Ali from Queen's Royal College were selected. Unfortunately due to technical problems with the US visa system, they were unable to obtain their visas in time to participate in the camp.

Scientific Research Council (SRC), Jamaica - INVOCAB

In February 2014, NIHERST partnered with the Scientific Research Council (SRC) in Jamaica on a three-year project entitled "Improving Innovation Capacities in the Caribbean" (INVOCAB). This EU-funded project is spearheaded the SRC and NIHERST and included teachers' colleges among other stakeholders in Jamaica, and the Ministry of Education in Trinidad and Tobago.

This project seeks 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 (16) 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 2015, the following activities were undertaken:

- conducted an in-depth needs analysis and prepared an evaluation report of 16 schools with a focus on the Science Education capacities including recommendations for improvement;
- facilitated two professional development workshops to improve the capacity/competence of 50 teachers/STI staff to transfer knowledge and technical skills of science subjects at both primary and secondary levels;
- hosted STEM camp for primary school students designed to promote science to students through hands-on applications of both Mathematics and Science in a stimulating and enjoyable small-group environment as well as to instil the concept of innovation at an early age;
- mentored 48 students to improve their capacity to think critically, problem solve and apply Science; and
- purchased 76 science kits and models for the selected four (4) primary and four (4) secondary schools to support the curricula for primary and secondary Mathematics and the secondary Science subjects of Information Technology (IT), Physics, Biology, Chemistry, Agricultural Science and Integrated Science.

Seismology in Schools (SIS)

Launched in 2014 with the training of two teachers from each of the eight (8) participating schools, the SIS programme introduced the science of geophysics to students from forms 3 – 6, and allowed them hands-on experience of seismology through the measurement of earthquakes and analysis of data captured to determine factors such as magnitude and location. Students are able to see how scientists work and how the physics, mathematics and geography principles being taught in the curricula can come alive in the real world situations. The programme is an adaptation of the successful Seismology in Schools project developed in the UK and adopted by schools around the world. NIHERST partners with the Ministry of Education and the UWI Seismic Research Centre (SRC), as well as the institutions at the helm of Seismology in Schools in the UK – University of Leicester, Durham University, Imperial College London and the British Geological Survey (BGS) - on this initiative.

The programme requires periodic visits to the schools for assistance with troubleshooting of the software and other IT elements, where issues arise as well as to promote enthusiasm among students. Various infrastructural issues with the IT network and Internet required updating. This is a work-in-progress through collaborative efforts with the Ministry of Education's Information Communication Technology Division (ICTD). School competitions are being planned for later cycles in the programme in order to promote continued motivation for student participation.

New Collaborative Projects

Several new collaborative initiatives were initiated in 2015. Details are given below.

Institute of Electrical and Electronic Engineers (IEEE) and IEEE Trinidad and Tobago Section

In 2015, NIHERST signed a Memorandum of Cooperation (MOC) with the IEEE, the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. This agreement allows both organizations to work together in areas of mutual interest in Science, Technology and Engineering and Mathematics (STEM) on world changing technologies – from computing and sustainable energy systems to aerospace, communications and robotics, focusing on pre-university activities for teachers and students (including camps, workshops, competitions, etc.) and other alternative avenues of inspiring the next generation of engineers and scientists. A MOC was also signed with the local section of the IEEE. The first fruit of the partnership with these professional bodies was the donation of an E-Scientia Exhibit which was installed at the National Science Centre. This exhibit and its accompanying programmes will expose learners to the application of engineering and computing to solve problems. The partnership also allowed a cadre of local CAPE and university students to gain basic training in the Arduino open-source electronics platform. The training which was held during the August vacation aimed to educate and inspire students to invent new products and create solutions to existing community societal problems.

British Gas/Sacoda Serv Limited

Through Sacoda Serv Limited, NIHERST signed an agreement to provide support for 250 students in the areas of East, Port of Spain and South Trinidad, to improve and broaden their knowledge of STEM concepts. The project titled "Youth Build" promotes the use of design-based learning approaches to STEM instruction that actively encourage students to work out solutions to design problems that impact their local communities, enabling students to find relevance and pursue their own interests. The project engages students in creative thinking and problem-solving and exposes them to the basics of innovation and invention, prototyping, project management, civic engagement and social responsibility.

Habitat for Humanity

NIHERST signed a Memorandum of Understanding (MOU) with the Habitat for Humanity Trinidad & Tobago to collaborate on bringing rainwater harvesting systems and training to families in Moriah, Tobago. NIHERST will be responsible for providing training in rainwater harvesting system installation and maintenance for members of the Moriah community and provision of rainwater harvesting system training materials and manual.

EU-CELAC Joint Initiative on Research and Innovation (JIRI)

This initiative aims to tap into the benefits of research collaboration with the European Union (EU) and the Community of Latin American Caribbean States (CELAC) through this country's participation in the EU-CELAC Joint Initiative for Research and Innovation (JIRI) and the ERANet-LAC Project. ERANet-LAC is a Network of the EU-CELAC Joint Innovation and Research Activities (KIRI). It aims to strengthen the bi-regional partnership in Science, Technology and Innovation by planning and implement concrete joint activities and by creating a sustainable framework for future bi-regional joint activities. It also provides an opportunity to address global challenges for the cooperation on science, technology and innovation, with focus on sustainable development and social inclusion.

OAS Working Groups

NIHERST participated in the OAS Working Groups (WGs) of the Plan of Action of Panama identified for prospective cooperation opportunities in the areas of: *Innovation (WG1)*, *Education* and *Human Resources (WG2*) and *Technological Development (WG4*). As part of these working groups, NIHERST learnt about the methodologies of the new studies and participated in the rollout of the "Survey on Young People's Perception of Science and Technology" and "Business Valuation of Professional Profiles in Engineering". With the purpose of training high level human resources in high-quality programs, NIHERST also promoted the CONACYT-Mexico and the OAS scholarship programs to students in Trinidad and Tobago who would like to pursue graduate studies in Mexico. This effort is part of the MOU signed between the GS/OAS and Ministry of Foreign Affairs of Mexico through the Mexican Agency for International Development.

Section 4: Financial Operations

a) Budget formulation

The institute prepares annual budgets using the zero-based budgeting approach. It incorporates full participation from all members of the management team. All managers are requested to prepare their work plan for the current year identifying the projects they wish to undertake. Costs are allocated to the activities from which departmental budgets are derived. These departmental budgets are then incorporated into the final budget for the year under Recurrent Expenditure and Capital Expenditure/Public Sector Investment Programme (PSIP).

Once the budget has been formulated it is approved by the President. It is then sent to the Finance Committee of the Board for approval and then to the Board of Governors for final approval before being sent to our Line Ministry.

b) Sources of revenue

NIHERST derives most of its revenue (over 95%) from government subventions. The subventions support the Recurrent Budget and Public Sector Investment Programme (PSIP). The institute generates some revenue from visitor admission fees to the National Science Centre and from registration fees for some of its activities. These activities include the hosting of vacation science camps, Caribbean Youth Science Forum (CYSF) which is held on an annual basis, SciTechKnoFest which is held bi-annually, and birthday parties for children at the National Science Centre. The revenue so derived is referred to as Other Income.

c) Financial performance – expenditure versus revenue

The following reports are based on unaudited figures for the year ended September 30th 2015. The results show the actual revenue and expenditure against the allocation and the respective variances.

The table summarises the two (2) revenue categories for the year in review.

Revenue by Source

Revenue Category	Allocation/Budgeted (TT$)	Actual Revenue (TT$)	Variance (TT$)
Recurrent Subvention	43,328,000	38,397,464	(4,930,536)
Other Income	1,300,000	1,313,556	13,556
TOTAL	**44,628,000**	**39,711,020**	**(4,916,980)**

The table summarises the four (4) expenditure categories for the year in review.

Expenditure by Category (Recurrent)

Expenditure Category	Allocation (TT$)	Actual Expenditure (TT$)	Variance (TT$)
Personnel Expenditure	8,037,400	6,584,608	1,452,792
Goods and Services	31,988,600	29,126,052	2,862,548
Minor Equipment	2,262,000	618,688	1,643,312
Current Transfers & Subsidies	2,340,000	1,661,556	678,444
TOTAL	**44,628,000**	**37,990,904**	**6,637,096**

The Development Programme is reflected in the table below for the year ended September 30, 2015.

Public Sector Investment Programme (PSIP)

Sub-Head/Description	Allocation (TT$)	Actual Expenditure (TT$)	Variance (TT$)
001 – Establishment of a National Science Centre	65,000,000	8,801,079	56,198,921
009 – Expansion and Upgrade of No. 8 Serpentine Place	500,000	4,950	495,050
010 – Document Handling	500,000	409,566	90,434
TOTAL	**66,000,000**	**9,215,595**	**56,784,405**

d) Internal audit functions

NIHERST does not have an internal audit department, however the services of an external auditor is employed on an annual basis to review the internal controls on selected areas of operations and the report is submitted to the Board for their review.

e) Debt policy

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

f) Investment policy

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

g) Financial report 2015

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.

Unaudited financial statements for FY 2015 are presented in *Appendix 2*.

Section 5: HUMAN RESOURCE DEVELOPMENT PLAN

a) Organisational establishment

As at the end of the reporting period, NIHERST employed 117 persons on a full-time basis consisting of 41 permanent employees and 64 persons 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 to better equip it to move forward and successfully implement its strategic plan. Work had ceased on the project as the recognized majority union, the Public Services Association of Trinidad and Tobago (PSA) held talks with NIHERST on the way forward with the union as an equal partner at the table to ensure the interests of the employees are served and protected. During this period, NIHERST Management and the NIHERST/PSA Management Section worked together to restart the project and get it back on track. The two parties met on March 25, 2015 to discuss the project and the way forward. At this meeting the Association expressed some concerns about the Hay method being used by the consultant, HRC Associates, and agreed to meet to discuss it. In May 2015, the consultant delivered a presentation to the Association on the Hay method, following which the Association agreed to proceed with the project. It was hopeful that the job evaluation would be completed within two months.

NIHERST Management, the Association, and HRC Associates met on June 5 to review the state of the current job descriptions and to agree on a job documentation/evaluation committee and a work plan moving forward. In June 2015, the consultant trained the committee in job documentation and the committee agreed on a plan to document all jobs in the bargaining unit by the end of July 2015. This task however continued until the end of the reporting period, after which the job evaluation committee would evaluate the non-management jobs, both permanent and on contract.

b) Category of employees

Operations at NIHERST are carried out by two distinct categories of staff, viz. permanent and contracted staff. When first established the institute's staffing requirements were fulfilled by officers who met the government standard requirements given the prevailing technologies of that time. Additionally, given the institute's portfolio at the time, staff requirements were not expansive. When, inevitably the institute's workload expanded, there was a need to recruit and maintain a larger workforce to meet the new directions in which NIHERST was heading. This gave rise to the dual categories in existence at present. For jobs made necessary by changes in

technology and new areas of endeavour, contracted employees were hired to complement those who held established positions. The job classes at NIHERST are manipulative, clerical, secretarial, administrative, technical and professional.

NIHERST also hires science demonstrators on a part-time basis to assist with the explaining of science exhibits and concepts to visitors to the National Science Centre. The institute continued to facilitate the MTEST on-the-job training programme with 29 trainees gaining experience at its offices during the period under review.

Additionally, from its inception NIHERST has facilitated returning national scholars with employment to fulfil post scholarship requirements. These Associate Professionals have always contributed to the development of NIHERST and continue to so do today. For the period under review, NIHERST facilitated 2 Associate Professionals.

c) Career path systems

Of the different classes of employees, only the manipulative staff operate without stratification in the positions of that class. Manipulative staff can, however, move into other classes, be it clerical or technical inter alia once the requisite experience, attitude and qualification can be demonstrated. In the other classes, there is stratification where officers can move into higher grades once they meet the requirements and a position is available. It is worth noting that currently there are insufficient levels in each job family because a number of positions were transferred to COSTAATT in the year 2000.

d) Performance assessment/management strategies

Full-time employees are assessed annually using the Performance Management System utilized by the Public Service. The Human Resource Department provides support to supervisors responsible for the completion of these reports where necessary by preparing draft standards/targets for job duties against which the performance of employees is measured. The Department also lends support by providing training to supervisors on the Performance Management System and its importance to the institute's goals and objectives.

e) Promotion – selection procedures

The selection procedure for promotion in the NIHERST-PSA Collective Agreement (Article 4: Employment and Promotion) was applied for both permanent and contract employees. 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

NIHERST continues to encourage 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.

NIHERST marked another successful year for training and development as we continued to strategically focus on the development of core competencies of individual employees/team members to contribute to the overall efficiency of departments. Sixty-nine (69) employees (approximately 59% of the staff) received training. Efforts were focussed on maintaining up-to-date skills, increasing employee productivity within the organization and preparing some employees for higher level duties. Details on the training conducted are contained in Appendix III.

Summarised below are some of the specific objectives of the training conducted.

- Enhancing, developing and nurturing the competencies of staff in decision-making
- Enabling Monitoring and Evaluation officers to understand the fundamentals of quantitative research from identifying a research problem to sampling techniques to some basic analytical techniques like correlation, regression and factor analysis
- Improving competencies in project management
- Improving the competencies of record stewards in electronic records management, policies and procedures to control and manage information resources
- Improving and strengthening supervisory skills for all supervisors
- Training key staff in health and safety to ensure the organisation complies with OSHA's safety requirements
- Exposing staff to low-cost micro-science kits promoted globally by UNESCO experiments in Biology, Physics and Chemistry
- Enhancing competencies of staff in the theoretical and practical aspects of 'technopreneurship' and innovation
- Enhancing competence in climate change adaptation in small island developing states (SIDS) and capacity for sustaining practices that would aid in reducing the carbon footprint and prepare for possible adverse effects.

Three (3) organization-wide workshops were conducted for a group of 14, 16 and 30 employees respectively. In addition, forty-eight (48) employees received individual training and some of them conducted knowledge sharing sessions with other staff members either in their department or at management/supervisory level.

Staff showed appreciation for the training received via their feedback forms. This appreciation was extended to but was not limited to the training received in Excellence in Hospitality, Protocol and Cross-Cultural Communication in Business and Industrial Relations training.

Group pension, health and insurance plans

NIHERST has a pension fund plan for its permanent employees established since January 1, 1988. As at September 2015, there were 59 members (41 from NIHERST and 18 from COSTAATT), 18 pensioners and 6 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 value of the Plan's assets was $54.7M as at the start of the reporting period. The Plan continued to perform fairly well, notwithstanding economic conditions.

NIHERST provides a Group Health and Life Insurance Plan for all full-time employees, permanent and contract, if they wish to join. As at September 2015, there were 57 members on the plan, with 4 members being retirees. The Life Insurance and Accidental Death & Dismemberment (LADD) benefit attached to this plan 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

Petrotrin EAP Services Limited (PEAPSL) continued to supply services on contract for the Employee Assistance Programme (EAP), which is open to all members of staff. During the period of this report, the scope of services was as follows:

- management consultations
- access to the 24 hour hotline
- quarterly and annual reports, EAP promotional items
- counselling and referral service – 8 sessions per issue per annum
- Management/Supervisory training
- Ongoing consultations with peer support volunteers.

Two Management Supervisory Workshops were conducted at the Head Office and National Science Centre locations in September 2015 for managers/supervisors with the objective of introducing the EAP as a tool for addressing job performance issues arising from people problems in the workplace and exploring the role of the supervisor in providing support to troubled employees and sharing with participants some relevant skills.

The staff continued to make use of the services of the Employee Assistance Programme through the counselling sessions which ensures strict confidentiality and promotes the wellbeing of staff. Reports submitted by PEAPSL show an increase in the number of new cases for the counselling sessions. The EAP continues to constitute a benefit and also a safety net for employees who have the need to utilise its programmes.

Section 6: Records Management

This project seeks to select and implement an Electronic (electronic and paper) Document and Records Management System (EDRMS) to capture, store, access, manage and dispose of documents, records and electronic images of paper-based information produced and acquired by the organization. The project commenced in July 2014 and will end in 2017. The project aims to:

- improve NIHERST information governance, accountability, transparency and compliance capability;
- manage the organisation's assets and records, information and knowledge management systems;
- promote efficiency and effectiveness in the management of documents;
- identify and use metadata which can be applied to the record's lifecycle; and
- create a centralized repository for institutional records.

The project team was recruited in September 2014 and has a staff of two persons, a Records Manager and a Records Assistant. With its setting up, NIHERST registered its professional membership in the Association of Information and Image Management (AIIM). The small number of staff, specialized activities and required deliverables necessitated a project structure to support and ensure the effective implementation of the programme. Consequently, an electronic records management (ERM) core team of Record Stewards team were constituted. The following are the activities executed in 2015.

a) **Record inventory**

An inventory of documents/records/information was undertaken across all departments of the organisation. A departmental profile matrix was developed to capture this information, tested and modified following interviews with Heads of Departments and their staff, noting each department's business processes, filing, storage and archiving systems and practices, policies, procedures and use of other technologies and services. A second round of meetings was held resulting in grouping by functional areas. Population of each departmental profile matrix commenced and is on-going.

b) Policies, procedures, guidelines

Electronic records management documentation to support the Records Management Programme was developed as follows: -

- A *Draft Records* and *Information Management (RIM) Policy*. The policy was completed and submitted to the Board of Governors for approval in July 2015. Approval was deferred pending the development of related ICT policies.
- *NIHERST Records Retention and Disposition Policy* (RRDP) and *NIHERST Draft Records Retention* and *Disposition Schedule (RRDS)*. A draft RRDP was developed and further refined, using the Finance and Human Resource Departments as the priorities for the RRDS. These schedules are at various stages of development.
- *NIHERST Document Security Classification*. A draft document was developed based on the requirements of the Freedom of Information Act (FOIA), the Data Protection Act (DPA) and inputs from senior management. The requirements of the Procurement Act will be incorporated in the draft document once that the Act is fully proclaimed. Clarification from the FOI Unit regarding interpretation of aspects of the FOIA relating to document security.

c) Consultations

Inputs were made to the national stakeholder consultations on the development of a *National Policy, Strategy and Guidelines on Data Classification* and the *Draft Open Data Readiness Assessment for Trinidad and Tobago.* NIHERST also completed the Records and Information (RIM) survey questionnaire disseminated by the National Archives of Trinidad and Tobago (NATT) to support the RIM framework project being developed for the public service by the International Records Trust (IRMT).

d) Sensitizing and training

Two organisation-wide EMR sensitization and awareness exercises were undertaken. In November, 2014 staff were requested to "take a pledge" to go paper free and a competition was hosted in recognition of *World Paper Free Day 2014*. Further in October/November, a team of 18 record stewards was constituted. Two (2) introductory team orientation sessions were facilitated to sensitize members to ERM concepts and principles as well as to identify each group's roles and responsibilities in the rollout of EDRMS project. Two (2) FOIA sensitization and awareness training sessions for management and records stewards were conducted by the FOIU staff.

In January 2015, sixteen (16) Record Stewards were trained in ERM by AIIM and subsequently received the designation of *ERM Practitioner* on passing an examination. Further, three (3) Records Stewards received training and certification from UTT in Digital Records Management & Preservation and Project Management for the Non-Project Manager. Knowledge sharing sessions (2) were then held for the ERM Core team and all Record Stewards. The first session was completed at which a second session planned for the first quarter of FY 2016.

e) Archiving and storage

Work commenced on a documented inventory of employees' files (closed and current). This master list once completed will be input into an employee database. The completion of this exercise is expected by January 2016.

f) Digitization

A demonstration was planned and conducted of a scanning workstation to meet the needs of possible digitization projects across NIHERST. Records Stewards of key operational departments at Head Office attended and evaluated the solution.

g) Procurement of EDRM system

Research was undertaken on possible suppliers of an EDRM system. Further procurement activities were however put on hold given budgetary constraints.

h) Project constraints

Factors in the external environment impeded progress. The ICT and Records Management Departments collaborated on alternative solutions and approaches to an EDRMS solution in light of a proposed "G-cloud" infrastructure. A decision on the way forward with the selection of a solution could not be made in the given situation. The departments therefore sought to maximize the use of available existing software functionalities, primarily O365, to manage and reduce costs and to improve processes in the organisation.

Section 7: Procurement Procedures

NIHERST recognizes procurement as a core function which contributes directly to the effectiveness and efficiency of departments and personnel. Through its procurement policy and with the guidance of the Ministry of Finance *Standard Procurement Procedures*, the management expressly states its intention and commitment to:

a. Adhere to proper procurement principles.

b. Conform to Health, Safety and Environmental Standards and all relevant and applicable local and international Legislation, Regulations and Requirements.

c. Abide by Generally Acceptable Accounting Principles.

d. Develop, maintain and continuously improve its Procurement Processes to satisfy internal and external customer requirements.

e. Operate in accordance with the provisions outlined in the By Laws of the Trinidad & Tobago as they relate to the procurement function.

NIHERST recognizes three (3) forms of tendering: Open Tendering, Selective Tendering and Sole Tendering. In the majority of cases selective tendering is used. However for large contracts either an open tendering process or a selective tendering process based on a prequalification process would be used. The NIHERST Board of Governors is required to approve all contracts for goods and services valued in excess of $450,000.

The table below summarises the contracts that were awarded during 2015 with the approval of the NIHERST Board of Governors:

Nature of Contract	Contact Date	Amount (exclusive of VAT)
Amalgamated Security Services Ltd - Security services for the National Science Centre	2 year contract awarded in principle but commencement of services is pending finalisation of contract document	Estimated at $47,375 monthly OR $568,500 annually
General Earth Movers Ltd – NIHERST Science City: Construction of the Access Road for the Science City construction site in Couva	23 April 2015	$13,127,127.47
Lonsdale Saatchi & Saatchi Advertising Limited - Science City Promotional Campaign	5 August 2015	$574,965.25

The tender for security services and the promotional campaign used selective tendering processes.

Between April 2013 and October 2014, invitations for prequalification were issued via advertisements in the local newspapers for consultancy services (e.g. architectural and engineering services) and for construction services for the Science City project. Applications were screened and subsequently invitations to tender for relevant services were issued to successfully pre-qualified contractors. One of these invitations was the site access road for which the contract was eventually awarded to General Earth Movers Ltd.

Section 8: 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 both push and pull methods in traditional and new media. The tactics and avenues employed include:

- E-mail marketing to databases of past and self-identified potential patrons
- Newspaper, television and radio advertisements
- NIHERST's website and social media networks – Facebook, YouTube, Twitter and Instagram
- Inclusion in local listings for tourism, entertainment, education and student support
- Direct marketing to schools and community members of target areas
- Science popularisation activities where NIHERST, in particular the Science Centre, reaches out to rural and underserved communities, particularly through its Community Science Weeks and events hosted by external agencies. The institute also offers free admission and provides transport, so disadvantaged persons can still attend or participate more easily.

In FY 2015, NIHERST further 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. Two major national advertising campaigns were also embarked upon - Prime Minister's Awards for Scientific Ingenuity in Nov 2014 and Science City awareness thrust in August 2015. Lonsdale Saatchi and Saatchi won both contracts for the provision of conceptualisation and promotion services.

The Science City campaign was fashioned for curiosity and anticipation building at a time when NIHERST had begun construction at Indian Trial in Couva. With an intended target of families, students and the general public, it aimed to excite with the modern and cutting-edge exhibits and activities planned. It conveyed Science City's intended value and contribution to the educational, innovation and entrepreneurship ecosystem. This included but was not limited to being a platform for lifelong (formal and informal) learning opportunities, building a science, technology and innovation literate and engaged workforce for a diversified knowledge economy, and inspiring and firing public imagination around Trinidad and Tobago's potential for globally competitive research and development.

Through a range of elements including press, television and radio advertisements, short videos for social media, static and digital billboards, and online ads, the campaign gave teasers and utilised a theme of "What If?" with NIHERST challenging the nation to consider its potential to transform lives and realities, by engaging with science and technology, and the NIHERST Science City. *"What if there were a place of learning and imagination?"* Communication successes included the Science City web page receiving over 15,000 hits and the NIHERST Facebook page receiving over 1000 new likes over the life of the campaign.

Smaller-scale national campaigns which were executed in-house included the launch of the third cycle of the NASA International Internship in December 2014, Astronomy Nights in January, March and April 2015, NASA returning intern public lectures in March, August and September 2015, T.A.P. into Science expo in April 2015, launch of the Science and Technology Research Database in May 2015 and promotion of the Caribbean Youth Science Forum in August 2015.

Success of this communication was evidenced through the increased public participation at the Science Centre and in various programmes including the following:

Project	**FY 2014**	**FY 2015**
NASA – International Internship Program	21 entries	36 entries
July/August Camps	1,100 participants	1,300 participants + 48 INVOCAB Camp participants
National Science Centre	15,253 visitors	22,831 visitors
Astronomy Night	1,355 patrons + 460 at Community Science Weeks' Saturday Astronomy Nights	1,527 patrons + 429 at Tap into Science's Saturday Astronomy Night
Prime Minister's Awards for Scientific Ingenuity	254 applications (in March 2013)	500 applications (in Dec 2014)

Notable also, NIHERST commissioned a one page partner profile in the Education Feature of the Commonwealth Heads of Government Meeting (CHOGM) 2015 Report. This insert was positioned to raise the profile of the Institute around the Commonwealth and increase visibility with the European Union, development banks and the United Nations.

In this period NIHERST also launched its presence on the social media network Instagram in order to engage with audiences, especially aged 14-29 years, receiving their information and entertainment through the more visually driven network. Increased awareness and engagement was facilitated and evidenced through the increase in queries and other communication received via both this and the Institute's Facebook account.

All advertisements, flyers, videos or other promotional material directed readers to NIHERST's website and social media accounts for access to the full range of offerings. Telephone numbers for calls, texts and other popular instant messaging was also included for those without internet access.

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
Atlantic LNG
BG Trinidad and Tobago
British Geological Survey (BGS)
Caribbean Academy of Sciences (CAS)
Caribbean Council for Science and Technology (CCST)
Caribbean Industrial Research Institute (CARIRI) - Centre for Enterprise Development
Caribbean Kids and Families Therapy Organisation (CKFTO)
Delegation of the European Union to Trinidad and Tobago
Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
Durham University
Eastern Regional Health Authority
Embassy of the United States in Port of Spain
European Union (EU)
Fab Foundation
Global Water Partnership-Caribbean (GWP-C)
Heroes Foundation
Imperial College London
Institute of Electrical and Electronics Engineers (IEEE) – Global
Institute of Electrical and Electronics Engineers – Trinidad and Tobago Section
Intellectual Property Office (IPO)
Massachusetts Institute of Technology
Ministry of Education - Curriculum Division
Ministry of Gender and Youth Affairs - Adolescent Intervention Programme

Ministry of Planning and Sustainable Development
Ministry of Science and Technology
NASA
NASA Ames Research Center (ARC)
National Entrepreneurship Development Company (NEDCO)
Office of Disaster Preparedness and Management (ODPM)
Organization of American States (OAS)
Sacoda Serv Limited
Scientific Research Council (SRC), Jamaica
Seismic Research Centre (SRC)
Technische Universität Dresden (TUD), Germany
Telecommunications Authority of Trinidad and Tobago (TATT)
The National Gas Company of Trinidad and Tobago (NGC)
The University of Trinidad and Tobago (UTT)

- Point Lisas Energy Campus
- Waterloo Research Centre

The University of the West Indies (UWI)

- Faculty of Engineering
- Faculty of Medical Sciences
- Seismic Research Centre (SRC)
- *Star Gazers*

Tobago House of Assembly (THA)
University of Leicester

T.A.P. into Science Exhibitors
British Gas - Safety and Science
Caribbean Agricultural Research & Development Institute
College of Science, Technology and Applied Arts of Trinidad and Tobago
DriveWise Trinidad
Environmental Management Authority
Forestry Division
Global Water Partnership - Caribbean
Institute of Marine Affairs
Metal Industries Company Limited
Ministry of Food Production
Ministry of Tertiary Education and Skills Training
National Alcohol and Drug Abuse Prevention Programme
National Centre for Persons with Disabilities
National Energy Skills Centre
National Gas Company
Office of Disaster Preparedness and Management
Petrotrin Petting Zoo
Professional Airline Training Solutions
RAPPORT
Sugarcane Feeds Centre
Telecommunications Authority of Trinidad and Tobago

Trinidad and Tobago Air Guard
Trinidad and Tobago Coast Guard
Trinidad and Tobago Regiment
University of the Southern Caribbean
The University of the West Indies
The University of Trinidad and Tobago

APPENDICES

APPENDIX 1

NATIONAL INSTITUTE OF HIGHER EDUCATION, RESEARCH SCIENCE AND TECHNOLOGY

(NIHERST)

STRATEGIC ACTION PLAN 2011-2015

January 25, 2011

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NIHERST STRATEGIC ACTION PLAN 2011-2015

1. INTRODUCTION

Since its establishment in 1984 the National Institute of Higher Education, Research, Science and Technology (NIHERST) has actively pursued its mandate to promote the development of science, technology and higher education in Trinidad and Tobago. The pursuit of this mandate has been guided both by changes in national development priorities and government's policy imperatives.

Over the odd thirty years or so, NIHERST has developed distinctive competencies in the following areas:

1. Fostering a culture of innovation through its outreach programmes in science popularization and science communication, particularly through the National Science Centre. This thrust is enhanced by its commitment to the development of creativity, as well as "technopreneurial" thinking and skills, through the undertaking of various activities, including the co-ordination of the Prime Minister's Biennial Award for Innovation and Invention.

2. Demonstrating a strong focus on research and intelligence gathering in the fields of science, technology and innovation (STI). This is exemplified by its pioneering efforts in the undertaking of foresighting and innovation studies. A specialized capacity to collect and analyze data and information on STI indicators have proven invaluable to NIHERST's role in the provision of policy advice and prescriptions to the Ministry.

3. Building linkages with regional and international organizations and managing collaborative projects in research, science and technology sponsored by external agencies.

Leveraging on these competencies, NIHERST was instrumental in achieving, among other things, the following:

1. Promotion of post-secondary education and training, and applied research and development in immediate and emerging priority areas (1984-1994).

2. Preparation of base documents that informed the draft national policy on a seamless education system and a national tertiary education policy (2002-2003) as well as the draft national science technology and innovation (STI) policy.

3. Spearheading the establishment in 2000 of a national community college, known as the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT).
4. Spearheading the establishment of the Accreditation Council of Trinidad and Tobago (ACTT), a national accrediting agency to perform "full accreditation functions".

5. Laying the groundwork for the creation of NCOSTI (1995-2005).

6. Supporting the establishment of University of Trinidad and Tobago (UTT) through Outreach and Service Learning (2006-2010).

Looking ahead, NIHERST will be required to deliver even more in terms of using science and technology to help diversify the Trinidad and Tobago economy away from its heavy dependence on energy. The rest of this document is structured as follows:

- Section 2 briefly outlines the evolving socio-economic environment in which NIHERST is likely to operate over 2011-2015

- Section 3 details the institutional framework that would guide the research and policy-based work of the Institute

- Section 4 determines the areas of strategic focus leveraging on the organization's inherent strengths and the current policy framework

- Section 5 concludes with the roll-out of the Strategic Action Plan in 2011-2015.

2. SOCIO-ECONOMIC ENVIRONMENT

The Strategic Action Plan was developed in the context of the policy framework articulated by the People's Partnership government, particularly the seven development pillars. The seven pillars are designed to do the following:

1. Foster people-centred development
2. Move closer towards eradicating poverty and promoting social justice
3. Ensure national and personal security
4. Expand the use and availability of Information and Communication Technologies
5. Steer the country towards a more diversified, knowledge intensive economy
6. Entrench good governance
7. Present an accommodating foreign policy

The pillar which is of particular relevance to NIHERST is the development of a more diversified, knowledge intensive economy. Trinidad and Tobago's economy is at the crossroads. A booming energy sector supported Trinidad and Tobago's impressive economic performance over the past decade, but the prospective depletion of natural gas reserves sometime over the current decade will require a major transformation to maintain a sustainable economy. STI is critical to help stimulate the non-energy sector, diversify the depth and range of economic activity and increase global competitiveness. There is an urgent need for the creation of new growth poles, largely premised on the development of knowledge intensive industries, leveraging high value export niches.

In its 2011 Budget, the Government proposed the development of five growth poles using a cluster development approach. The first pole covers Couva, Charlieville, Carapichaima and Chaguanas. The second pole will focus on developing the South Western Peninsula of Trinidad. The third growth pole will be the East Port of Spain Area. The fourth growth pole involves developing the North-Coast. The fifth growth pole is in the North East region of Tobago. NIHERST will utilize STI to facilitate the development of projects in these growth poles.

The 2011 Budget also endorses the creation of a National Innovation System (NIS) that effectively links Centres of Excellence, small and medium enterprises, finance, marketing and market development systems. The NIS is intended to facilitate the restructuring of the economy, and NIHERST through its foresight studies and exercises is well positioned to make a significant contribution in the successful implementation of this restructuring effort.

STI can also generate positive impacts on the delivery of social services, in promoting environmental sustainability, and, in general, improving the quality of life of the citizenry. For example, a well designed business incubator program will enhance the links among entrepreneurship, innovation and small business development. Or the development of alternative energy sources, such as solar and wind energy improves the long term sustainability of the country's energy supply. The Government of Trinidad and Tobago has committed itself to the integration of STI into the activities of every sector. NIHERST has a very important role to play in this regard.

3. INSTITUTIONAL ENVIRONMENT

The role and repositioning of NIHERST must be contemplated in the context of the institutional environment, and the role and function of other relevant institutions, both existing and proposed, including the Ministry of Science, Technology and Tertiary Education; the Economic Development Board; the Council for Competitiveness and Innovation; and the National Commission for Higher Education.

Ministry of Science, Technology and Tertiary Education (MSTTE)

NIHERST's line ministry, the Ministry of Science, Technology and Tertiary Education (MSTTE), is responsible for tertiary education, technical and vocational education and training, and science and technology. With specific reference to STI, the MSTTE is responsible for policy direction, monitoring and the governance by:

- Being a responsive research and results driven organization, optimally resourced with the capacity and intelligence systems to satisfy the needs of all key stakeholders for Science, Technology and Innovation to achieve national aspirations

- Understanding and facilitating the STI needs of Trinidad and Tobago and facilitating an environment that creates the capacity to understand, adopt and adapt scientific and global technologies, knowledge, entrepreneurial skills, innovation and growth in various modern and advanced products and services, leading to country competitiveness

- Ensuring the platform for advancement of Human Development, within the context of STI intellectual leadership, by increasing access to quality tertiary education and training that fosters the capacity of citizens to understand, adopt and adapt scientific and global technologies

- Developing and promoting a national STI culture and regional leadership in STI

Outcomes have been defined by the MSTTE relative to three categories, namely Human Development, Users and Governance. The outcomes most relevant to NIHERST with respect to these categories are as follows:

- Human development – increase in the number of scientists, technologies and engineers engaged in R&D; scientific and technologically literate population; a culture of science, technology and innovation

- Users- increased entrepreneurs; increased retention of science and technology graduates; mastering the use of imported and indigenous technology; understanding and application of STI in all organizations; development and growth of knowledge based industry; application of knowledge to products for best-in class performance

- Governance- national system of innovation; substantial increase in public/private sector investment in research development and innovative activity

The key strategy themes identified by MSTTE include:

- Develop and analyze STI priorities, policy, options and implement
- Manage STI capacity building and competitiveness

- Manage research and innovation
- Manage innovation mapping and intellectual property progress
- Manage contestable research, development and innovation and training funds
- Manage alliances, relationships and strategic linkages
- Manage, measure, report, monitor STI development performances

Consistent with the above, the Minister of Science, Technology and Tertiary Education, in his contribution to the 2011 Budget debate in the Senate, articulated the need for the strengthening and rebranding of the Ministry as follows:

- Renewing the focus on research, monitoring and evaluation.
- Placing significant emphasis on fostering a culture of Innovation and Entrepreneurship.
- Strengthening the Science and Technology thrust within the Ministry.
- Developing a National Life Skills policy for all levels of education and training.
- Enhancing the ICT capability consistent with the new approach towards data driven policy formulation to encourage data management and sharing among agencies and institutions

The National Commission for Higher Education

The establishment of the National Commission for Higher Education seeks to enhance the effective governance of the national higher education system. The Commission has broad based representation which will ensure that planning for tertiary education development and transformation, and policy formulation, implementation and review will take cognizance of all elements and activities within the national education system. It will be specially tasked with the responsibility of eliminating duplication and waste, enhancing coordination and synergies in the sector, and promoting the seamless progression from pre-school to university level in a range of subjects. The Commission will also seek to promote an appropriate research agenda consistent with government's development strategy.

Economic Development Board

In the People's Partnership Manifesto the Economic Development Board is described as an agency to "provide advice on economic policy after consulting with Communities and stakeholder advisory councils." The Board was recently established and is in the process of formulating its strategic agenda consistent with government's policy direction.

Council for Competitiveness and Innovation

The Council for Competitiveness and Innovation has been identified in the People's Partnership Manifesto in the context of the need to upgrade the country's global competitiveness infrastructure to and provide incentives for research and development.

The Council was recently established and is in the process of formulating its strategic agenda consonant with government's policy.

Other Institutions

There are other institutions which NIHERST will have to partner with to facilitate economic restructuring and realignment in the context of the National Innovation System. These institutions include the Business Development Company, UWI, UTT, eTecK and CARIRI. NIHERST must ensure that it locates its role within the matrix of these and other related institutions to avoid duplication and to maximize its contribution to national development.

NIHERST Business Eco-system

NIHERST has performed an environmental scan of institutions locally, regionally and internationally that form part of the STI community in which the Institute operates. NIHERST intends to build collaborative ties with the regional players and global centres of excellence. It also intends to extend links with enterprises and enterprise development institutions, and to seek project funding from international agencies. Figure 1 below depicts the major institutions in NIHERST's business eco-system, one that is more diversified and global than the system within which it functioned over the past decade.

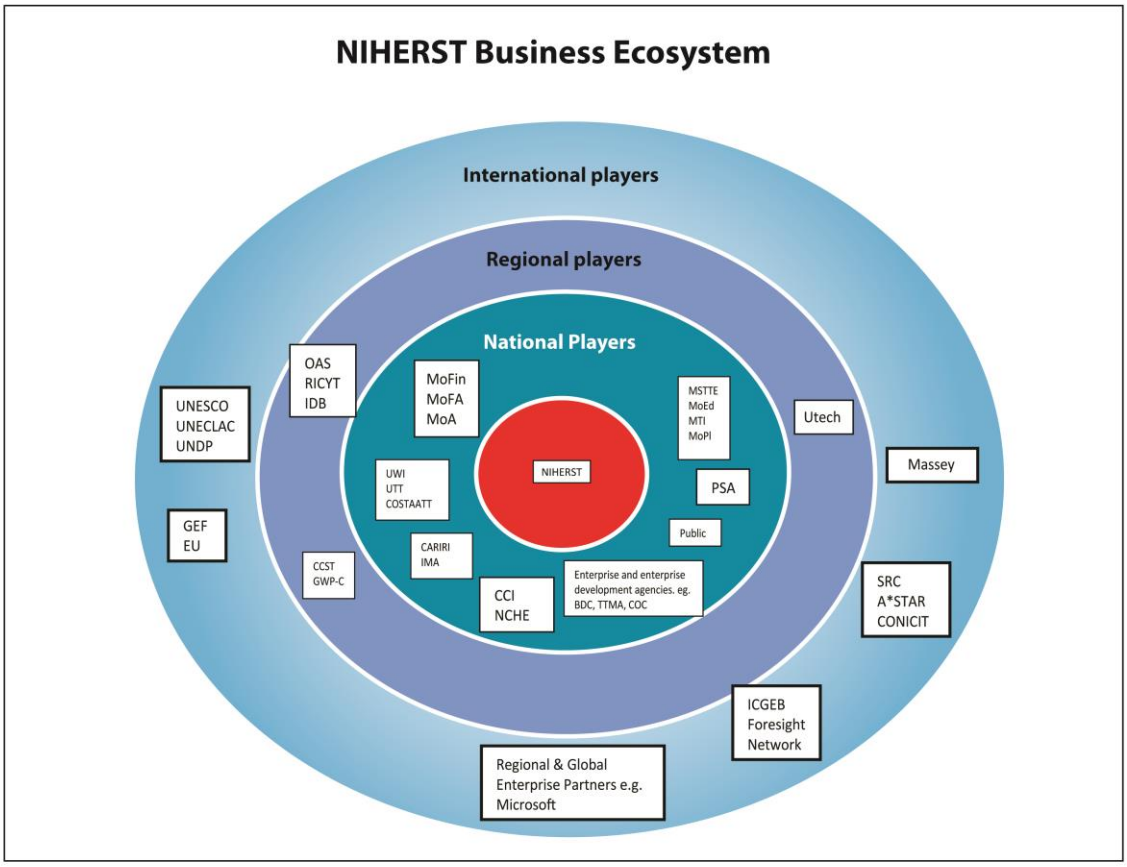

Figure 1: Drawing of NIHERST's Business Ecosystem[1] [i]

[1] Abbreviations can be found in Appendix 1

4. AREAS OF STRATEGIC FOCUS

Areas of strategic focus represent the strategic priorities of the organization, in the context of its mandate, its capabilities and its role in the matrix of related institutions. NIHERST should seek to leverage its distinctive competencies to facilitate the utilization of research, science and technology in the service of innovation and competitiveness. It should seek to position itself to take advantage of opportunities which present themselves in the dynamic and evolving global environment.

The objectives of the specific areas of strategic focus for NIHERST can be summarized as follows:

1) Research and Intelligence Gathering In Support of Economic Diversification

- To provide policy support and advocacy to MSTTE in developing a national STI policy
- To undertake STI policy studies in the 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
- 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 foresight 'best bets'
- To establish a contestable fund for raising national R&D in identified niches and priority areas

3) Building Collaborative Global Relationships

- To build international relationships with world-class STI institutions
- To establish and maintain linkages with specialized 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

- Restructure NIHERST in line with the Strategic Plan
- Develop a plan for the physical consolidation of offices
- 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
- To recognise excellence in STI

The Strategic Action Plan is built around the Objectives derived from the Areas of Strategic Focus. For each objective we identify measures, target, strategic initiatives, timeframe, resources required and accountabilities.

Each focus area of NIHERST's Strategic Action Plan is expected to have long-term outcomes that are beneficial to NIHERST and the wider community.

Focus Area 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 best-in-class model for small island developing countries in Africa, the Pacific and the Caribbean. 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.

Focus Area 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.

Focus Area 3: Building Collaborative Global Relationships

The institutions that NIHERST collaborate 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.

Focus Area 4: Positioning NIHERST as a World Class STI Institute

It is expected that operational efficiency and effectiveness of NIHERST is improved and the Institute's brand name would be recognised at home and abroad as a leading institution in STI.

Focus Area 5: Fostering a Culture of Science, Innovation and Creativity

The development of a culture of science, innovation and creativity will lead to an improved performance of primary and secondary school children 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.

The outcomes listed above are dependent not only on NIHERST but also on other institutions in the national innovation system playing their part to support these outcomes. The Strategic Action Plan below gives further details on each strategic area of focus.

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
1. Research and Intelligence Gathering in Support of Economic Diversification	**Objective 1: To Provide Policy Support and Advocacy to MSTTE in Developing a National STI Policy**								
	1.1.1 Coordinating the development of a national STI policy and strategy	National STI policy and strategy completed	Draft STI Policy, 2006		Policy completed		Policy review and update		Office of the President
	1.1.2 Undertaking a study on venture capital requirements to stimulate STI development	Study completed with concrete policy recommendations	Not applicable		Study completed				
	1.1.3 Technical support to the: - National Council for Competitiveness and Innovation - Economic Development Board - National Commission for Higher Education - Transformation Unit re: National Innovation System	Information resources and support provided	Not applicable	All requests met	All requests met	All requests met	All requests met	All requests met	
	1.1.4 Policy support for National Commission for Higher Education and other relevant public bodies & institutions	Number of policy briefs and recommendations completed	Not applicable	1	2	2	2	2	
	Objective 2: To Undertake STI Studies in Support of Economic Diversification								
	1.2.1 Undertaking business feasibility studies based on completed foresight sector studies in prioritised areas: 1. High-value cocoa development 2. Bio-active agents for new products (biotechnology) 3. Caribbean health & wellness spa 4. Global connectedness & competitiveness for creative industries	Number of business studies and roadmaps completed (initially derived from Foresight "Best Bets").	1 study and roadmap completed	1	2	1	2	2	Office of the President

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
1. Research and Intelligence Gathering in Support of Economic Diversification	1.2.2 Technical studies to support development of the 5 growth poles 1. Renewable energy: i) *National* - Development of a renewable energy resource map ii) *South Western Peninsula*- Feasibility of wave energy utilisation with IMA & UTT	Number of technical studies completed in the 5 growth poles i.e. 1. North Coast 2. South Western Penisula 3. 4 Cs (Carapichaima, Couva, Charlieville and Chaguanas) 4. East POS and 5. North East region of Tobago:	Not applicable			2 completed			
	1.2.2 Technical studies to support development of the 5 growth poles 2. *4Cs*- Renewable energy & agricultural development/innovation for poverty eradication and disaster preparedness: (iii) Application of renewable energy in Carapichaima-Korea village or other suitable community (iv) Revitalisation of sugar with TT/ India Chamber of Commerce) *3.East POS*- Renewable energy & entrepreneurship in creative arts: (vi) Study on the application of technologies for port disaster preparedness (vi) Study on leveraging cultural capital to develop community theatre arts	Number of technical studies completed in the 5 growth poles i.e. 1. North-Coast2. South Western penisula, 3. 4 Cs (Carapichaima, Couva, Charlieville and Chaguanas) 4. East POS and 5. North East region of Tobago:	Not applicable		4 completed	2 completed	2 completed		Office of the President

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
1. Research and Intelligence Gathering in Support of Economic Diversification	4. *North-Coast-* University City in St. Augustine (vii) Technical Study on Smart City for St. Augustine (viii) Mobile learning/business solutions to support Smart City.								
	5. *North East region of Tobago*- High-value tourism products & Renewable Energy (ix) Feasibility study on medical tourism (x) Study on application of methane capture and utilisation to support industrial development with environmental sustainability.								
	Objective 3 : To Undertake International Benchmarking and Comparative Studies on R&D/STI, Competitiveness and Innovation								
	1.3.1 Undertaking country policy studies on competitiveness and innovation to improve T&T's competitive ranking: - Singapore (STI management for global competitiveness) - Costa Rica (ICT exports, national innovation system, biodiversity and sustainability development) - India (Agriculture, biotechnology and agri-technology) - Brazil (Smart City, renewable energy and								

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
1. Research and Intelligence Gathering in Support of Economic Diversification	biotechnology) - Uruguay (SME innovation and high-tech exports) - Ireland (FDI into non-energy sector) - New Zealand (STI governance)								
	1.3.1 Undertaking country policy studies on competitiveness and innovation to improve T&T's competitive ranking: - Israel (High tech start- ups/ commercialisation of innovation) - South Africa (STI management infrastructure development)	Number of case studies & action plans completed to inform policy	not applicable	2 (Singapore & Costa Rica)	2 (India &Brazil)	2 (New Zealand & Ireland)	2 (Uruguay & Ireland)	2 (Israel & South Africa)	Office of the President
	Objective 4: To Develop a Strong Capability in Knowledge Management to Support T&T's Knowledge-Based Economy								
	1.4.1 Creation of the leading STI portal in the Caribbean	Number of persons visiting portal	16,700		Portal Created	10 % increase	20 % increase	30 % increase	
	1.4.2 Development and implementation of a knowledge management ecosystem for NIHERST	Knowledge management (KM) system developed and information shared	Not applicable		System developed			Review and update	

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
1. Research and Intelligence Gathering in Support of Economic Diversification	1.4.2 Development and implementation of a knowledge management ecosystem for NIHERST	Increase in size of information collection	8000 books 240 DVDs 94 videos 25 subscriptions	10%	20%	30%	40%	50%	
	1.4.3 Implementation of the EU-LAC Joint Initiative for Research and Innovation	Best practice and application of the EU-LAC Joint Initiative	Not applicable	Initiative implemented					
2. Promoting Innovation and Commercialisation of Technology in Priority Areas	**Objective 1: Commercialisation of Technology in Priority Areas**								
	2.1.1 Establishing a technology commercialisation fund (public-private partnerships incl. venture capital & angel investments)	Number of new starts ups funded	Not applicable	Guidelines for operation completed	Funding Sourced & Financing of "best bets"	Financing of "best bets"	Financing of "best bets"	Financing of "best bets"	
	2.1.2 Establish a contestable fund for R&D in support of 1.2.1 & 1.2.2 (public-private partnership)	Number of consortia projects funded	Not applicable		2	4	4	4	
3. Building Collaborative Global Relationships/Partnering	**Objective 1: To Build International Relationships with World Class STI Institutions**								
	3.1.1 Undertake assessments to identify institutions for collaborative partnerships - A*STAR, Singapore (R&D) - National Council for Science, Technology and Communication, India (STI) - The IdeaFactory, Singapore (Business incubation) - Institut Für Offene Kommunikation, Germany (S&T)								

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
3. Building Collaborative Global Relationships/Partnering	3.1.1 Undertake assessments to identify institutions for collaborative partnerships: - North Shore City Council, NZ, (Smart City) - Curitiba, Brazil, (Smart City) - The Icehouse and New Zealand Trade Enterprise, New Zealand (Innovation Commercialisation/ SMEs) - Wuppertal Institute, Germany (Renewable Energy) - Juergen Stau, Germany (Renewable Energy) - Chocolate Research Facility , Singapore, (High value cocoa products) - Windsor- Essex County Government, Canada (Smart City)	Number of STI agreements undertaken	2		Sign and executing 2 agreements a year	3	4	4	International Projects Unit
	Objective 2: To Establish/Maintain Linkages with Specialized Regional and International Research, Science and Technology Institutions								
	3.2.1 Develop collaborative projects	Number of collaborative projects finalised	2	Microsoft Innovation Centre (Software Development)launched Certificate in Foresight Studies launched with Arthur Lok Jack Graduate School of Business	GWP-C (Community based Rainwater Harvesting Project.) CCST (Caribbean Knowledge Network)	CCST (Innovation Sector Study 1. Service sector 2. Manufacturing)	GWP-C (2nd Community based Rainwater Harvesting Project.) CCST (extend Caribbean Knowledge Network)	CCST (Mapping Agriculture and Climate Change)	International Projects Unit

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
4. Position NIHERST as a World Class STI Institute	**Objective 1: To Position NIHERST as a World Class STI institute**								
	4.1.1 Restructure NIHERST in line with Strategic Plan	New Organisational Plan for NIHERST developed	Not applicable	Organisational plan completed and approved	NIHERST restructured				Office of the President/Human Resources
	4.1.2 Develop a plan for the consolidation of offices	Plan developed	Not applicable	Relocation POS offices to east Trinidad completed				Newly constructed headquarters completed	Office of the President
	4.1.3 Develop a strategy to rebrand NIHERST as a world class STI institute	Strategy developed and activities implemented	Not applicable	Strategy completed	Activities implemented	Activities implemented adjustments made	Activities implemented adjustments made	Activities implemented adjustments made	Human Resource Unit
5. Culture of Science, Innovation and Creativity	**Objective 1: To Engage Citizens in the Learning of Science**								
	5.1.1 Creation of a world class National Science Centre	Develop a plan for the construction of a permanent National Science Centre			Feasibility study completed	Start of construction		Construction completed	
5. Culture of Science, Innovation and Creativity	5.1.2 Hands on Minds on - National Discovery Programme in STI	Staging of Sci-TechKnoFest & community science weeks (CSWs)	350 visitors a day – CSWs 2,500 visitors a day forSci-TechKnoFest	Sci-TechKnoFest Held	3 community science weeks held	Sci-TechKnoFest Held	3 community science weeks held	Sci-TechKnoFest Held	
		Staging of National Science Fair with Ministry of Education	Currently not done		Fair held	Fair held	Fair held	Fair held	National Science Centre/ Science Education Unit

5. NIHERST Strategic Action Plan 2011-2015

Focus Areas	Strategic Initiatives	Measure	Target						Accountabilities
			Baseline	2011	2012	2013	2014	2015	
	5.1.2 Hands on Minds on - National Discovery Programme in STI	Hosting of Caribbean Youth Science Forum	Forum hosted with 250 participants	10% increase in participants	15% increase in participants	20% increase in participants	30% increase in participants	40% increase in participants	
		Launch of a vacation science academy for gifted students (i.e. with a passion for science)	Not applicable		Academy Launch with 1160 participants	10% increase in participants	20% increase in participants	30% increase in participants	
5. Culture of Science, Innovation and Creativity	**Objective 2 : To Provide Hands-On Experience for Developing Capabilities in Technological Innovation and Entrepreneurship**								
	5.2. Establish Junior Engineers Club (JEC)	Launch of JEC	Not applicable		Debe launch		Tobago launch	Chaguanas Launch	
	5.2.2 Re-launch Prime Minister's Awards for Innovation & Invention and introduce new competitions in technological innovation (Robotics with Microsoft Innovation Centre)	Percentage of entrants in Prime Minister's Awards	180	10% increase		20% increase		30% increase	
	Objective 3: To Recognise Excellence in STI								
	5.3.1 Administer appropriate award schemes to recognise excellence in STI	Launch of a new system of STI awards	Review and revised icons awards		Launch of Awards	Distribution of awards		Distribution of awards	Office of the President
	5.3.2 Recognise Teachers for excellence in the teaching of Math & Science	Introduction of "Best Science & Math Teacher Awards"	Not done		Launch of Awards				
	5.3.3 Document T&T's Scientific Legacy	Produce publications on T&T's scientific legacy	1 biennial publication			Publication issued		Publication issued	

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
1. Research and Intelligence Gathering in Support of Economic Diversification	**Objective 1: To Provide Policy Support and Advocacy to MSTTE in Developing a National STI Policy**				
	1.1.1 Coordinating the development of a national STI policy and strategy	Fees for local consultant for 10 mths. - $200,000 Fees for international reviewer - $126,000 Venue, breaks & materials for 3 consultations - $75,000 Sub-total - **$401,000**			
	1.1.2 Undertaking a study on venture capital requirements to stimulate STI development	Fee for 3 mos consultancy by local expert - **$157,500**			
	1.1.3 Technical support to the: - National Council for Competitiveness and Innovation - Economic Development Board - National Commission for Higher Education - Transformation Unit re: National Innovation System	Fees for 90 consulting hours by subject experts @ $6,000 per day Sub-total - **$540,000**	+10% **$594,000**	+10% **$653,400**	-10% **$588,100**
	1.1.4 Policy support for National Commission for Higher Education and other relevant public bodies & institutions	Fees for 50 consulting hours @ $6,000 per day Sub-total - **$300,000**	+10% **$330,000**	+10% **$363,000**	-10% **$326,700**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
1. Research and Intelligence Gathering in Support of Economic Diversification	**Objective 2: To Undertake STI Studies in Support of Economic Diversification**				
	1.2.1 Undertaking business feasibility studies based on completed foresight sector studies in prioritised areas: 1. High-value cocoa development 2. Bio-active agents for new products (biotechnology) 3. Caribbean health & wellness spa 4. Global connectedness & competitiveness for creative industries	Fees for consulting business analysts @$157,500 per study x 2= **$315,000**	Fees for consulting business analyst for 1 study = **$157,500**	+10% per study x 2 studies= **$346,500**	+5% per study x 2= **$363,825**
	1.2.2 Technical studies to support development of the 5 growth poles 1. Renewable energy: i) *National* - Development of a renewable energy resource map ii) *South Western Peninsula*- Feasibility of wave energy utilisation with IMA & UTT		**$10,000** **$25,000**	**$10,000** **$25,000**	**$10,000** **$50,000**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
1. Research and Intelligence Gathering in Support of Economic Diversification	1.2.2 Technical studies to support development of the 5 growth poles 2. *4Cs*- Renewable energy & agricultural development/innovation for poverty eradication and disaster preparedness: (iii) Application of renewable energy in Carapichaima- Korea village or other suitable community (iv) Revitalisation of sugar with TT/ India Chamber of Commerce) *3.East POS*- Renewable energy & entrepreneurship in creative arts: (vi) Study on the application of technologies for port disaster preparedness (vi) Study on leveraging cultural capital to develop community theatre arts	Fees for 6 consultancies of 3-4 mths. duration @ $500,000 per study= $3,000,000 Equipment & Supplies for implementation for 4 applied projects @ approx. $400,000 each = $1,600,000 Sub-total **-$4,600,000**	Fees for 3 consultancies of 3-4 mths. duration @ $525,000 per study= $1,575,000 Equipment & Supplies for implementation for 3 applied projects @ approx. $350,000 each = $1,050,000 $115,000 Sub-total **-$2,625,000**	Fees for 3 consultancies of 3-4 mths. duration @ $551,250 per study= $1,653,750 Equipment & Supplies for implementation for 3 applied projects @ approx. $500,000 each = $1,500,000 $115,000 Sub-total **-$3,153,750**	Fees for 3 consultancies of 3-4 mths. duration @ $551,250 per study= $1,653,750 Equipment & Supplies for implementation for 3 applied projects @ approx. $500,000 each = $1,500,000 $120,000 Sub-total **-$3,153,750**
	1. *North-Coast*- University City in St. Augustine (vii) Technical Study on Smart City for St. Augustine (viii) Mobile learning/business solutions to support Smart City.				

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
1. Research and Intelligence Gathering in Support of Economic Diversification	2. *North East region of Tobago*- High-value tourism products & Renewable Energy (ix) Feasibility study on medical tourism (x) Study on application of methane capture and utilisation to support industrial development with environmental sustainability.			$50,000	$50,000
	Objective 3 : To Undertake International Benchmarking and Comparative Studies on R&D/STI, Competitiveness and Innovation				
	1.3.1 Undertaking country policy studies on competitiveness and innovation to improve T&T's competitive ranking: - Singapore (STI management for global competitiveness) - Costa Rica (ICT exports, national innovation system, biodiversity and sustainability development) - India (Agriculture, biotechnology and agri- technology) - Brazil (Smart City, renewable energy and biotechnology) - Uruguay (SME innovation and high-tech exports) - Ireland (FDI into non-energy sector) - New Zealand (STI governance)	Contract for Sr. Policy Analyst @$35,000 p.mth. incl. perks -$420,000 Contract for Jr. Policy Analyst $20,000 p.mth. incl. perks - $240,000 Sub-total- **$660,000**	Contract for Sr. Policy Analyst @$35,000 p.mth. incl. perks -$420,000 Contract for Jr. Policy Analyst $20,000 p.mth. incl. perks - $240,000 Sub-total- **$660,000**	Contract for Sr. Policy Analyst @$35,000 p.mth. incl. perks - $420,000 Contract for Jr. Policy Analyst $20,000 p.mth. incl. perks - $240,000 Sub-total- **$660,000**	Contract for Sr. Policy Analyst @$35,000 p.mth. incl. perks - $420,000 Contract for Jr. Policy Analyst $20,000 p.mth. incl. perks - $240,000 Sub-total- **$660,000**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
1. Research and Intelligence Gathering in Support of Economic Diversification	1.3.1 Undertaking country policy studies on competitiveness and innovation to improve T&T's competitive ranking: - Israel (High tech start- ups/ commercialisation of innovation) - South Africa (STI management infrastructure development)	Travel for 2 officers Singapore (12 dys) - $120,000 India (12 dys)- $95,000 Sub-total - **$215,000**	Travel for 2 officers New Zealand (8dys)- $125,000 Brazil (10dys) -$95,000 Sub-total - **$220,000**	Travel for 2 officers Uruguay(8dys) - $95,000 Ireland (8 dys) - $90,000 Sub-total - **$185,000**	Travel for 2 officers Israel (8dysl – $115,000 South Africa (10dys) - $140,000 Sub-total - **$255,000**
	Objective 4: To Develop a Strong Capability in Knowledge Management to Support T&T's Knowledge-Based Economy				
	1.4.1 Creation of the leading STI portal in the Caribbean	Contract for web master @$15,000 p.mth. incl. perks - **$180,000**	+2% **$192,780**	+2% **$196,636**	2% **$200,569**
	1.4.2 Development and implementation of a knowledge management ecosystem for NIHERST	Fee for KM & ICT consultancy - $200,000 IT hardware & software - $150,000 Sub-total - **$350,000**	Maintenance fee $15,000	Maintenance fee $15,750	Maintenance Fee $16,540
	1.4.3 Implementation of the EU-LAC Joint Initiative for Research and Innovation	Travel to 1 meeting & 2 workshops - $65,000 3 technical studies @ 20,000 each = $60,000 Sub-total - **$125,000**	Travel to 1 meeting & 2 workshops - $70,000 3 technical studies @ 30,000 each = $90,000 Sub-total - **$160,000**	Travel to 1 meeting & 2 workshops - $77,000	
	TOTAL for Focus Area 1	**$7,843,500**	**$4,989,280**	**$5,736,036**	**$5,674,484**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
2. Promoting Innovation and Commercialisation of Technology in Priority Areas	**Objective 1: Commercialisation of Technology in Priority Areas**				
	2.1.1 Establishing a technology commercialisation fund (public-private partnerships incl. venture capital & angel investments)	Seed Technology Commercialisation Fund - **$1,000,000**	No additional funding. Infusion of equity and angel investment	New cycle of govt seed funding **$5,000,000**	No additional funding. Infusion of equity and angel investment
	2.1.2 Establish a contestable fund for R&D in support of 1.2.1 & 1.2.2 (public-private partnership)	Seed R&D Fund - **$1,000,000**		New cycle of govt seed funding **$5,000,000**	No additional funding. Infusion of equity and angel investment
	TOTAL for Focus Area 2	**$2,000,000**	**$0**	**$10,000,000**	**$0**
3. Building Collaborative Global Relationships/Partnering	**Objective 1: To Build International Relationships with World Class STI Institutions**				
	3.1.1 Undertake assessments to identify institutions for collaborative partnerships - A*STAR, Singapore (R&D) - National Council for Science, Technology and Communication, India (STI) - The IdeaFactory, Singapore (Business incubation) - Institut Für Offene Kommunikation, Germany (S&T)	As at 1.3.1 above	As at 1.3.1 above	As at 1.3.1 above	As at 1.3.1 above

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
	3.1.1 Undertake assessments to identify institutions for collaborative partnerships: - North Shore City Council, NZ, (Smart City) - Curitiba, Brazil, (Smart City) - The Icehouse and New Zealand Trade Enterprise, New Zealand (Innovation Commercialisation/ SMEs) - Wuppertal Institute, Germany (Renewable Energy) - Juergen Stau, Germany (Renewable Energy) - Chocolate Research Facility , Singapore, (High value cocoa products) - Windsor- Essex County Government, Canada (Smart City)	As at 1.3.1 above	As at 1.3.1 above	As at 1.3.1 above	As at 1.3.1 above
3. Building Collaborative Global Relationships/Partnering	**Objective 2: To Establish/Maintain Linkages with Specialized Regional and International Research, Science and Technology Institutions**				
	3.2.1 Develop collaborative projects	GovTT contribution to Microsoft Innovation Centre as per MOA (facilities & other operational costs) - $1,612,800 Fees for curriculum for certified in foresight studies - $30,000 Sub-total - **$1,642,800**	GovTT contribution to Microsoft Innovation Centre as per MOA (facilities & other operational costs) - $1,612,800 Contribution to 2 other projects - $60,000 Sub-total - **$1,780,800**	GovTT contribution to Microsoft Innovation Centre as per MOA (facilities & other operational costs) - $1,612,800 Contribution to 2 other projects - $70,000 Sub-total - **$1,652,800**	GovTT contribution to Microsoft Innovation Centre as per MOA (facilities & other operational costs) - $1,612,800 Contribution to 2 other projects - $80,000 Sub-total - **$1,662,800**
	TOTAL for Focus Area 3	**$2,962,800**	**$3,100,800**	**$2,972,800**	**$2,982,800**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
4. Position NIHERST as a World Class STI Institute	**Objective 1: To Position NIHERST as a World Class STI institute**				
	4.1.1 Restructure NIHERST in line with Strategic Plan	Contract for Marketing & Communication Mgr @$18,000 p.mth. incl. perks - $216,000 Contract for PR & Communication Officer @ $15,000 p.mth. incl. - $180,000 Sub-total - **$396,000**	+2% **$403,920**	+2% **$412,000**	+2% **$420,240**
	4.1.2 Develop a plan for the consolidation of offices		Joint project with science centre construction. See 5.1.1. below	See 5.1.1. below	See 5.1.1. below
	4.1.3 Develop a strategy to rebrand NIHERST as a world class STI institute	Fee for marketing & branding consultancy **-$200,000**	Promotions- $300,000	Promotions - $335,000	Promotions - $340,000
	TOTAL for Focus Area 4	**$596,000**	**$703,920**	**$747,000**	**$760,240**
5. Culture of Science, Innovation and Creativity	**Objective 1: To Engage Citizens in the Learning of Science**				
	5.1.1 Creation of a world class National Science Centre	Fee for consultancy to upgrade previous feasibility studies & technical specs for design - **$600,000**	25% cost of building (200,000 sq.ft. x$650 per sqf = $$162.5M) & exhibit construction ($40.0M)+ 10% project management	50% cost of construction + project management fees **$110.0M**	25% cost of construction + project management fees **$55.0M**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
			fees for total est .$220M) **$55.0M**		
5. Culture of Science, Innovation and Creativity	5.1.2 Hands on Minds on - National Discovery Programme in STI	Promotions, transport & materials for CSWs @$250,000 each x 3= **$750,000** Construction of mobile RE exhibit using HRV for CSWs & Sci-TechKnoFest 2013- $850,000 Sub-total -$**1,600,000**	Promotions, transport & materials for CSWs @$260,000 each x 3= **$780,000** Desk top exhibits for classes – 2 sets of 10 = $600,000 Staging of Science festival - $4,500,000 **$5,880,000**	Promotions, transport & materials for CSWs @$260,000 each x 3= **$780,000** Desk top exhibits for classes – 2 sets of 10 = $600,000 **$1,380,000**	Incl. staging science festival **$6,000,000**
		Contract for additional Science Educator @ $12,000 p.mth. **=$144,000**	+2% **$146,880**	+2% **$149,818**	+2% **$152,815**
	5.1.2 Hands on Minds on - National Discovery Programme in STI	Catering 7 dys - $400,000 UWI accommodation - $400,000 Honoraria, transport & promotions - $400,000 Sub-total **- $1,200,000**	**$1,200,000**	**$1,225,000**	**$1,225,000**
		Contract for Sr. Innovation Educator@$18,000 p.mth.incl. perks = $216,000 Science materials & kits $200 p.a. x 1160 students-	+2% **$677,280**	+2% **$690,827**	+2% **$704,645**

NIHERST Financial Projections for 2012-2015

Focus Areas	Strategic Initiatives	Fiscal Year			
		2012	2013	2014	2015
5. Culture of Science, Innovation and Creativity		$232,000 Sub-total- **$664,000**			
	Objective 2 : To Provide Hands-On Experience for Developing Capabilities in Technological Innovation and Entrepreneurship				
	5.2. Establish Junior Engineers Club (JEC)	Promotions, materials & equipment **$400,000**	**$400,000**	**$425,000**	**$450,000**
	5.2.2 Re-launch Prime Minister's Awards for Innovation & Invention and introduce new competitions in technological innovation (Robotics with Microsoft Innovation Centre)	Prizes **-** $2,000,000 Promotions - $200,000 Sub-total - **$2,200,000**	Promotions - $100,000 Publication on inventors and icons - $80,000 Sub-total - $180,000	Prizes **-** $2,500,000 Promotions - $90,000 Sub-total - **$2,590,000**	Promotions - $120,000 Publication on inventors and icons - $90,000 Sub-total - **$210,000**
	Objective 3: To Recognise Excellence in STI				
	5.3.1 Administer appropriate award schemes to recognise excellence in STI				
	5.3.2 Recognise Teachers for excellence in the teaching of Math & Science				
	5.3.3 Document T&T's Scientific Legacy				
	TOTAL for Focus Area 5	**$2,200,000**	**$55,780,000**	**$110,780,000**	**$55,600,000**
	TOTAL for Strategic Plan	**$15,602,300**	**$64,574,000**	**$130,235,836**	**$66,017,524**

NIHERST Operational Financial Projections for 2011-2015

DESCRIPTION	2011 APPROVED ESTIMATES $	2012 $	2013 $	2014 $	2015 $
REVENUE					
GOVERNMENT SUBVENTION	32,199,490	37,963,312	41,371,213	45,109,122	49,210,279
OTHER INCOME	1,000,000	1,100,000	1,210,000	1,331,000	1,464,100
TOTAL INCOME	**33,199,490**	**39,063,312**	**42,581,213**	**46,440,122**	**50,674,379**
EXPENDITURE					
PERSONNEL EXPENDITURE	6,752,960	7,428,256	7,799,669	8,189,652	8,599,135
REMUNERATION TO BOARD MEMBERS	689,400	689,400	689,400	689,400	689,400
GOODS AND SERVICES	23,358,930	28,030,716	30,833,788	33,917,166	37,308,883
MINOR EQUIPMENT PURCHASES	692,300	1,038,450	1,194,218	1,373,350	1,579,353
CURRENT TRANSFERS AND SUBSIDIES:-					
PENSIONS AND GRATUITIES	1,605,900	1,766,490	1,943,139	2,137,453	23,51,198
MEDICAL HEALTH CONTRIBUTION	100,000	110,000	121,000	133,100	146,410
TOTAL EXPENDITURE	**33,199,490**	**39,063,312**	**42,581,213**	**46,440,122**	**50,674,379**

Appendix 1

List of Abbreviations

BDC – Business Development Company

CARIRI – Caribbean Industrial Research Institute

CCI – Council for Competiveness and Innovation

CCST – Caribbean Council for Science and Technology

COC – Chamber of Commerce

CONICIT - English Acroynm for The National Council for Scientific Research and Technology

COSTAATT – College of Science, Technology and Applied Arts of Trinidad and Tobago

EU – European Union

GEF – Global Environmental Fund

GWP-C – Global Water Partnership – Caribbean

ICGEB – International Centre for Genetic Engineering and Biotechnology

IDB – Inter-American Development Bank

IMA – Institute of Marine Affairs

MoA – Ministry of Agriculture

MoED – Ministry of Education

MoFA – Ministry of Foreign Affairs

MoFin – Ministry of Finance

MoPI – Ministry of Planning

MSTTE – Ministry of Science, Technology and Tertiary Education

MTI – Ministry of Trade and Industry

NCHE – National Commission for Higher Education

OAS – Organization of American States

PSA – Public Service Association

RICYT – Inter-American Network of Science and Technology Indicators

SRC- Scientific Research Council

TTMA – Trinidad and Tobago Manufacturing Association

UNDP – United Nations Development Programme

UNECLAC – United Nations Economic Commission for Latin America and the Caribbean

UNESCO – United Nations Educational, Scientific and Cultural Organization

UTech – University of Technology

UTT – The University of Trinidad and Tobago

UWI- The University of the West Indies

APPENDIX II

NATIONAL INSTITUTE OF HIGHER EDUCATION
(RESEARCH, SCIENCE & TECHNOLOGY)

UNAUDITED
ANNUAL FINANCIAL STATEMENTS
FOR THE YEAR ENDED
DECEMBER 31, 2015

NATIONAL INSTITUTE OF HIGHER EDUCATION (RESEARCH, SCIENCE & TECHNOLOGY)
STATEMENT OF FINANCIAL POSITION AS AT DECEMBER 31, 2015

	NOTES	2015	2014
		$	$
FIXED ASSETS	3	3167,816	3795,585
CURRENT ASSETS			
Fixed Deposit		2450,913	2461,279
Interest Receivable		10,366	6,622
VAT Receivable		2767,045	1341,905
Debtors		3528,827	310,949
Prepayments		349,763	2626,376
Suspense		740,525	744,789
Cash at Bank		51906,503	48191,950
Cash in Hand		12,513	10,013
		61766,455	55693,883
LESS CURRENT LIABILITIES			
Accrued Expenses		7838,137	3792,578
Creditors		805,279	480,447
Deferred Income	4	49086,265	49043,622
VAT Payable		127,622	353,889
		57857,303	53670,536
NET CURRENT ASSETS		3909,152	2023,348
TOTAL ASSETS LESS TOTAL LIABILITIES		7076,968	5818,933
		=========	========
FINANCED BY:			
Reserve Balance at Beginning of the year		5818,933	5539,894
(Deficit)/Surplus for year		1258,035	279,039
		7076,968	5818,933
		=========	========

The following accompanying notes an integral part of these Financial Statements.

NATIONAL INSTITUTE OF HIGHER EDUCATION (RESEARCH, SCIENCE & TECHNOLOGY)

STATEMENT OF COMPREHENSIVE INCOME
FOR THE YEAR ENDED DECEMBER 31, 2015

	NOTES	2015	2014
		$	$
FIXED ASSETS	3	3167,816	3795,585
CURRENT ASSETS			
Fixed Deposit		2450,913	2461,279
Interest Receivable		10,366	6,622
VAT Receivable		2767,045	1341,905
Debtors		3528,827	310,949
Prepayments		349,763	2626,376
Suspense		740,525	744,789
Cash at Bank		51906,503	48191,950
Cash in Hand		12,513	10,013
		61766,455	55693,883
LESS CURRENT LIABILITIES			
Accrued Expenses		7838,137	3792,578
Creditors		805,279	480,447
Deferred Income	4	49086,265	49043,622
VAT Payable		127,622	353,889
		57857,303	53670,536
NET CURRENT ASSETS		3909,152	2023,348
TOTAL ASSETS LESS TOTAL LIABILITIES		7076,968	5818,933
FINANCED BY:			
Reserve Balance at Beginning of the year		5818,933	5539,894
(Deficit)/Surplus for year		1258,035	279,039
		7076,968	5818,933

NATIONAL INSTITUTE OF HIGHER EDUCATION (RESEARCH, SCIENCE AND TECHNOLOGY)
STATEMENT OF CASH FLOWS FOR THE YEAR ENDED DECEMBER 31, 2015

	NOTES	2015	2014
		$	$
OPERATING ACTIVITIES			
(Deficit)/Surplus		1258,035	279,039
Adjustments:			
Disposal of Assets			
Depreciation		962,537	818,878
Decrease in Deferred income		42,643	16061,534
Sub Total		2263,215	17159,451
Decrease in Accrued Expenses		4045,559	(2188,878)
Increase in Creditors		324,832	(120,942)
Sub Total		4370,391	(2309,820)
Increase in Vat Receivable		(1651,407)	675,047
Increase in Receivables – Interest		(3,744)	3,744
Increase in Debtors		(3217,878)	4082,630
Decrease in Prepayments		2276,613	(76,017)
Decrease in Suspense		4,264	(463,159)
Sub Total		(2592,152)	4222,245
CASH PROVIDED BY OPERATING ACTIVITIES		**4041,454**	**19071,876**
INVESTING ACTIVITIES			
Purchase of Fixed Assets		(334,768)	(2065,824)
Increase in Fixed Deposit		10,368	(10,366)
CASH PROVIDED USED IN INVESTING ACTIVITIES		**(324,400)**	**(2076,190)**
FINANCING ACTIVITIES			
Loans		0	0
Repayment of loans for year		0	0
CASH PROVIDED USED IN FINANCING ACTIVITIES		**0**	**0**
Net Increase/(Decrease) in Cash/Cash Equivalents		3717,053	16995,684
Prior Year Adjustments		0	0
Cash and Cash Equivalents at the beginning of the year		48201,962	31206,278
CASH AND CASH EQUIVALENTS AT END OF YEAR		**51919,015**	**48201,962**
CASH AND CASH EQUIVALENTS/ REPRESENTED BY			
Cash at Bank		51906,503	48191,950
Cash in Hand		12,512	10,012
		51919,015	**48201,962**

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED DECEMBER 31, 2015

1. PRINCIPAL BUSINESS ACTIVITIES

The National Institute of Higher Education (Research, Science and Technology) (NIHERST) is a Statutory Authority incorporated by Act of Parliament No. 20 which was assented to on June 28, 1984. The principal objectives of the Institute are as follows:

a. To provide and promote scientific and technological services in society;
b. To promote and develop an indigenous capability in science and technology relevant to the developmental needs of the society; and
c. To assist national bodies and/or organisations in securing technology appropriate to their needs.

2. SIGNIFICANT ACCOUNTING POLICIES

The significant accounting policies adopted in the preparation of these financial statements are stated below:

a. Basis of Preparation

These financial statements are prepared in accordance with International Financial Reporting Standards (IFRSs), and are stated in Trinidad and Tobago Dollars. These financial statements have been prepared on a historical basis.

b. Adoption of new and revised IFRSs and (IFRICs)

During the current year, the Institute adopted new, amended and revised International Financial Reporting Interpretations (IFRICs) which are relevant to its operations and are effective for accounting periods commencing on or before January 1, 2013. The adoption of these Standards did not have a material effect on the financial statements, however additional disclosures were required.

c. Property, Plant and Equipment

It is the Institute's policy to account for property, plant and equipment at cost. Depreciation is provided on the straight-line basis at the rates estimated to write-off the assets over their expected useful lives.

Current rates of depreciation are:

Equipment	- 331/3%
Furniture and Fittings	- 10%
Motor Vehicle	- 25%
Exhibits	- 25%

d. Cash and Cash Equivalents

For the purpose of the statement of cash flows, cash and cash equivalents comprise of bank balances.

e. Investments

Held-to-Maturity investments are carried amortised cost.

f. Grants Funding

Grants are recognised at their fair value where there is a reasonable assurance that the grants will be received and the Institute will comply with all attached conditions.

Grants relating to revenue are recognised in the Statement of Comprehensive Income over the period necessary to match them with the expenditure for the year, which they are intended to compensate.

Grants relating to the purchase of property, plant and equipment are deferred in liabilities and are credited to the Statement of Comprehensive Income on a straightline basis over the expected lives of the related assets.

g. Receivables

Receivables are carried at original invoice amount less provision for impairment of these receivables. A provision for impairment of receivables is established when there is objective evidence that the Institute will not be able to collect all amounts due according to the original terms of the receivables. The quantum of the provision is the difference between the carrying amount and the recoverable amount.

h. Payables

Payables are carried at cost which is the fair value of the consideration to be paid in the future for services rendered.

i. Use of Estimates

The preparation of financial statements in conformity with International Financial Reporting Standards requires management to make estimates and assumptions that affect the reported amount of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reported period. Actual results could differ from these estimates.

j. Financial Instruments

Financial instruments carried on the Statement of Financial Position include cash and bank balances, receivables, investments and are stated at their approximate fair values determined in accordance with the individual policy statements associated with each item.

k. Revenue Recognition

Revenue is recognised to the extent that it is probable that the economic benefits will flow to the Institute and the revenue can be reliably measured. Revenue is recognised upon performance of services and customer acceptance. Interest and investment income are recognised as they accrue unless collectability is in doubt.

l. Impairment of Assets

Non-financial assets

The Institute's assets at each reporting date whether there is an indication that an asset may be impaired. If any such indication exists, or when annual impairment testing for an asset is required, the Institute makes an estimate of the asset's recoverable amount. An asset recoverable amount is the higher of an asset's fair value less costs to sell and value in use and is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. When the carrying amount of an asset exceeds its recoverable amount, the asset is considered impaired and is considered impaired and is written down to its recoverable amount. In assessing value in use, the estimated future cash flows are discounted to their present value.

m. Employee Benefits

The Institute's full- time employees are covered by The National Institute of Higher Education (Research, Science and Technology) (NIHERST) Pension Plan, a Defined Benefit Plan. The pension accounting costs for the plan is assessed using the projected unit actuarial method. Under this method the cost of providing pensions is charged to the Statement of Comprehensive Income so as to spread the regular cost over the service lives of the employees in accordance with the advice of the qualified actuary who carries out a full valuation on the plan every three years.

n. Provisions

Provisions are recorded when the Institute has a present legal or constructive obligation as a result of past events. It is probable that an outflow of resources will be required to settle the obligation and a reliable estimate of the amount can be made.

3. FIXED ASSETS SCHEDULE 2015

	Equipment	Furniture & Fittings	Motor Vehicles	Exhibits	TOTAL
COST:	$	$	$	$	$
B/F 2015 At beginning of the year	12664,394	2014,139	1100,844	12819,480	28598,857
Acquisitions 2015	322,926	11,842			334,768
Disposals/Adjustments	0	0	0	0	0
	12987,320	2025,981	1100,844	12819,480	28933,625
Accumulated Depreciation:					
B/F 2015 At beginning of the year	10900,083	952,442	580,167	12370,580	24803,272
Disposals/Adjustments	0	0	0	0	0
2015 Charge	536,146	26,882	130,169	269,340	962,537
	11436,229	979,324	710,336	12639,920	25765,809
NET BOOK VALUE AT 2015 DECEMBER 31	1551,091	1046,657	390,508	179,560	3167,816
NET BOOK VALUE AT 2014 DECEMBER 31	1764,311	1061,697	520,677	448,900	3795,585

4. DEFERRED INCOME

	2015	2014
I) Cash Donations	$	$
Balance as at January 1, 2015	49043,622	32948,272
Increases for the year 2015*	42,643	16095,350
Decreases for the year 2015**		
Sub-Total	49086,265	49043,622
II) Non Cash Donations		
Balance as at January 1, 2014		
Less Decreases for the year 2014	0	0
Increases for the year 2014*	0	0
Less Depreciation for the year 2013	0	
Sub-Total	0	
Total Deferred Income	49086,265	49043,622

5. GOODS AND SERVICES	2015 $	2014 $
Travelling	946,844	1175,692
Uniforms	23,670	45,453
Electricity	618,385	670,415
Telephone	612,776	712,739
Water and Sewerage	9,083	9,079
Rent/Lease-Office Accommodation	4593,617	4219,775
Rent/Lease-Vehicles & Equipment	192,917	238,142
Office Stationery and Supplies	394,258	422,514
Books and Periodicals	69,102	144,187
Materials and Supplies	1451,264	621,375
Maintenance of Vehicles	73,089	163,056
Repairs and Maintenance- Equipment	216,497	106,127
Contract Employment	7206,891	7874,712
Training	181,887	414,459
Official Entertainment	-	31,560
Repairs & Maintenance-Buildings	292,353	498,341
Short Term Employment	1770,159	1293,961
Fees	398,883	354,565
Official Overseas Travel	65,452	140,822
Other Contracted Services	655,307	464,436
Janitorial Services	204,300	379,776
Security Services	937,932	973,917
Insurance	292,824	378,267
Promotions, Publicity & Printing	1082,570	1235,391
Hosting of Conferences & Seminars	4207,415	2260,886

Employee Assistant Programme	26,947	38,602
Total Goods and Services	**26524,422**	**24868,247**

APPENDIX III

STAFF TRAINING AND DEVELOPMENT

DEPARTMENT	TRAINING INSTITUTION	TRAINING PROGRAMME	TRAINING PERIOD	NO. OF PERSONS TRAINED
General Administration	Trinidad and Tobago Hospitality and Tourism Institute (TTHTI)	Excellence in Hospitality Service	September 30, 2014 & October 2, 2014	6
Information Technology	Massy Technologies	Avaya System Administration Training	October 3, 2014	2
Office of the President, Human Resource	Trinidad and Tobago Group of Professional Association Ltd, The Professional Centre	Industrial Relations	October 8, 2014	2
Policy, Research & Intelligence, International Projects, and Monitoring & Evaluation	Ministry of Planning and Sustainable Development	VII Americas Competitiveness Forum 2014- The Human Imagination at Work	October 8-10, 2014	6
Science Education, Innovation	Ministry of Planning and Sustainable Development	VII Americas Competitiveness Forum 2014- The Human Imagination at Work	October 8-10, 2014	3
Documentation Centre	Library Association of T&T (LATT)	Ordinary General Meeting and Conference	October 17, 2014	1
International Projects Unit	The Global Water Partnership-Caribbean (GWP-C), the GEF Amazon Project, the GEF International Waters Learning Exchange and Resource Network (IW:LEARN) and the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)	Rainwater Harvesting (RWH)	October 21-23, 2014	2
S&T Statistical Unit	Ibero-American Network of Science and Technology Indicators (RICYT)	Technical Committee Meeting	October 28-29, 2014	1

DEPARTMENT	TRAINING INSTITUTION	TRAINING PROGRAMME	TRAINING PERIOD	NO. OF PERSONS TRAINED
Facilities and Programmes Administration, Human Resource Department	Human Resource Management Association of Trinidad and Tobago (HRMATT)	Workplace Shutdown for Health and Safety Reasons	October 31, 2014	2
General Administration	Trinidad and Tobago Group of Professional Association (TTGPA)	Protocol & Cross-Cultural Communication in Business	November 18, 2014	2
Marketing & Corporate Communications	Caribbean Ideas Limited	Caribbean MIX Leadership Conference	November 19-21, 2014	3
Policy, Research and Intelligence Department	National Council for Science, Technology and Technological Innovation of Peru (CONCYTEC)	IV Americas Regional Meeting of the Global Research Council (GRC)	November 19-20, 2014	1
Human Resource Department	Human Resource Management Association of Trinidad and Tobago (HRMATT)	SHRM Strategic Human Resource Management- Delivering Business Results	November 25, 2014	1
Human Resource Department, Accounts Department	Institute of Chartered Accountants of Trinidad and Tobago	Corporate Governance	November 27, 2014	2
Facilities and Programmes Administration, Innovation	The Safety Council of Trinidad and Tobago	Electricity in the Workplace- Sparkle not Spark for Christmas and Carnival	December 4, 2014	3
Departmental Records	The Spirit Group Ltd, regional partner of the Association of Information and Image Management (AIIM)	Electronic Records Management	January 29-30, 2015	14
Human Resource Department	School of Business and Computer science Ltd (SBCS)	BA (Hons) Human Resource Management from the University of Greenwich	January - December, 2015	1
Science Education	University of Dayton, Ohio in collaboration with CREDI - the Catholic Institute in Trinidad	Masters in Educational Leadership	January - April, 2015	1

DEPARTMENT	TRAINING INSTITUTION	TRAINING PROGRAMME	TRAINING PERIOD	NO. OF PERSONS TRAINED
Research and Development	United Nations Framework Convention on Climate Change	UNFCCC Fellowship Programme for Small Island Developing States 2014	February 1– June 30, 2015	1
Science Education	University of Dayton, Ohio in collaboration with CREDI - the Catholic Institute in Trinidad	Masters in Educational Leadership	February 5, 2015	1
Science Education	Guyana National Commission for UNESCO	UNESCO's Sub-Regional Micro-Science Workshop Guyana	April 27-28, 2015	1
Marketing	Demming Communication	Media Training	April 23, 2015	1
All Departments	Arthur Lok Jack Graduate School of Business	Supervisory Skills Training	May 11, 14, 20 & June 3, 2015	30
General Administration	Trinidad and Tobago Chamber of Industry and Commerce	5th Caribbean Facilities Management Conference and Expo 2015	May 13-14, 2015	1
Human Resource	Human Resource Management Association of Trinidad and Tobago (HRMATT)	Conducting Effective Internal Investigations	May 21, 2015	1
Records, Human Resource, Accounts	University of Trinidad and Tobago (UTT) - Professional Education Unit	Digital Records Management and Preservation	August 4- 6, 2015	3
International Projects & Records	University of Trinidad and Tobago (UTT) - Professional Education Unit	Project Management for the Non Project Manager	August 11-12, 2015	2
International Projects	School of Business and Computer science Ltd (SBCS)	Project Management Professional (PMP) Certification	September 6-November 8, 2015	3
Human Resource	Employer's Solution Centre (ESC)	Culture Shock: Exploring New Strategies Towards a Reduction of Absenteeism in the Workplace	October 29 & 30, 2015	1

DEPARTMENT	TRAINING INSTITUTION	TRAINING PROGRAMME	TRAINING PERIOD	NO. OF PERSONS TRAINED
Monitoring and Evaluation	University of the Southern Caribbean	Quantitative Data Analysis	November 11-13, 2015	2
All Departments	Corporate Health Environmental and Safety Solutions Limited	Basic First Aid	November 27, 2015	16
Procurement	Arthur Lok Jack Graduate School of Business	Principles of Contract Law	December 7-9, 2015	2