NIHERST

Annual Report | 2012

This report provides an account of the major achievements made by NIHERST towards meeting its strategic objectives for the financial year October 2011 to September 2012. It is submitted in compliance with section 19(3) of the NIHERST Act (Chapter 39:58) which requires the Institute to submit to the Minister to whom the responsibility of science and technology is assigned, a report on its activities during the preceding financial year.

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Chairman's Statement

Prof Prakash Persad

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The Government of Trinidad and Tobago's development thrust focuses on creating a diversified, competitive and knowledge-based economy. The diversification process requires nurturing the creative and innovative capacity of our citizens, shifting the national mindset away from the traditional economic and employment staples, to the generation of new and sustainable sources of wealth particularly in high value, niche markets. It is also imperative to increase investment in science, technology and innovation (STI), and build human and institutional capacity, which stimulates the non-energy sector, diversifies the depth and range of economic activity and boosts global competitiveness.

The NIHERST Mission

Prior to the appointment of its new Board of Governors in November 2010, NIHERST had been waiting a decade for its role as a key national science and technology organization to be redefined, following its leadership role in setting up COSTAATT and ACTT, which resulted in the transfer of its higher education and accreditation functions to these bodies in 2000 and 2002 respectively. One role that had been articulated and developed in some detail was that of a council for science and technology. However, the plan was shelved following the decision that was taken in 2006 to absorb the institute into The University of Trinidad and Tobago (UTT). This development either reduced or halted the institute's unique and pioneering work to help build national capacity in STI, and particularly its seminal science popularisation programme.

Fortunately, the long hiatus did not translate into a lost decade by any means, due to the trademark resourcefulness of the organisation in pursuing its mandate to foster a national culture of STI. On the contrary, despite the constraints and setbacks, NIHERST was able to expand its efforts into new areas that promote creativity, innovation, entrepreneurship and strategic foresight, and support knowledge-based development. NIHERST's myriad programmes promote widespread literacy and understanding of the role of STI in development, nurturing a society that can uphold and accelerate scientific and technological advancement in all sectors.

A Visionary Agenda for a New Era

The strengthening, over 30 years, of its distinctive competencies in non-formal science education, research and intelligence gathering, and building strategic regional and international alliances ensured that NIHERST was well poised to support the agenda set by the new Board, in alignment with the development policy framework of the People's Partnership government.

The Board's first task was to guide the formulation of a Strategic Action Plan for 2011-2015. The overarching focus is on building and strengthening national capacity in science and technology, creativity and innovation, and entrepreneurship, with activities falling within the context of development pillar 1 (People Centred Development) and development pillar 5 (Creating a More Diversified, Knowledge-Intensive Economy).

The plan aims to position NIHERST as a world class STI institute and to increase its reach and impact in the national community. The plan was fully endorsed by the Ministry of Science, Technology and Tertiary Education (MSTTE), which recognises the importance of having an institution dedicated to promoting a culture of creativity, innovation and knowledge production, and supporting human resource development as well as the work of other key agencies engaged in research and development (R&D) and science and technology education.

The NIHERST Board of Governors is very pleased to present this report with the highlights of achievements made in the first year of the plan as well as the financial statements. We commend the NIHERST management and staff for their hard work, productivity and commitment that ensured high quality output and timely delivery on the goals laid out for FY 2010/11.

Prakash Persad

Chairman, Board of Governors

President's Review

Mrs Maureen Manchouk

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A Year of Significant New Strides

In 2012, NIHERST was able to gain traction on the new goals and directions set for it in the five-year strategic plan that had been implemented in 2011. Coupled with the continued expansion and refinement of its existing programmes, these achievements have advanced the institute's core mission to build national scientific and technological capacity through the following strategic areas articulated under the plan:

- *fostering a national culture of science, technology, innovation (STI) and entrepreneurship, which includes an extensive science popularization programme and national awards schemes., to help raise the levels of literacy, awareness and engagement in both children and adults in Trinidad and Tobago;*

- *undertaking research and intelligence gathering and strategic foresight to aid policy development and to promote economic diversification and country advancement; and*

- *accelerating development in STI through the building and strengthening of collaborative strategic alliances with local, regional and international partners.*

The momentum gained in 2012 has led to increased impact on the national community in terms of the greater range of offerings, the span of the population benefiting from our initiatives and the wider reach across the country.

Undoubtedly, the most significant development in this FY, and certainly a major milestone in NIHERST's 30 year history, was the allocation by government of a 52-acre plot in Indian Trail, Couva as home for the new state-of-the-art national science centre. The centre will be part of a larger complex of facilities that will form NIHERST Science City. Planning for the complex began in October 2011, for the first phase which is scheduled for completion in 2015. Science City will be an exciting and world-class learning environment and exhibition space, showcasing new and emerging global technologies and local scientific ingenuity that will encourage visitors of all ages, and students especially, to deepen their interest, understanding and engagement in science, technology and innovation. For FY 2012, approximately 77,000 children and adults in Trinidad and Tobago benefited from NSC's programmes (in non-formal science education and the teaching of technological creativity, innovation and entrepreneurship ('technopreneurship'). This was due largely in part to the following events that occurred during FY 2012.

Another highlight of the year was the re-launching of the institute's awards scheme to honour the country's leading scientists. Re-branded as the NIHERST Awards for Excellence in Science and Technology, the 2012 awards recognised the achievements of 17 of Trinidad and Tobago's outstanding researchers and/or educators both here and abroad, in the fields of engineering, applied science and technology, natural sciences and medical sciences. This programme is an important part of NIHERST's mission to foster of culture of science and technology by raising the public visibility of our scientists; recording their achievements for posterity; and inspiring science students to follow in their footsteps and build on that scientific heritage.

In science popularization, NIHERST added another initiative to its extensive work in this area - the NIHERST Science Music Video Awards Competition, which challenges youths between the ages of 14 and 28 to create music videos that appeal particularly to their generation but can raise awareness among the general population of important scientific and technological issues.

NIHERST also expanded its work in the area of research and intelligence gathering (strategic goal 3) with the establishment of the new Research & Intelligence Gathering Unit. This unit has the responsibility for providing support and advocacy for developing a national S&T policy and undertaking international benchmarking and comparative studies on STI. This work complements the work of the S&T Statistical Research Unit, which conducts surveys on STI and analyses the collated data to inform policy. In 2012, a new survey entitled Survey of Innovation in the ICT Sector 2012, was conducted, in addition to the updating of the Public Perception of Science Survey done almost a decade ago and the annual Survey of S&T Indicators

2012 also saw the institute establish new international partnerships and areas for cooperation to advance national development goals. Among them was the signing of a memoranda of understanding with the National Institute of Science, Technology and Development Studies (NISTADS) - one of 38 institutes/laboratories of the Government of India's Council of Scientific and Industrial Research (CSIR) – as well as India's National Council of Science Museums (NCSM). The first fruit of these agreements was the staging of NCSM's large scale science and technology exhibition: India: A Culture of Science, which showed the importance and power of the application of STI to socio-economic development. The exhibition attracted over 51,000 visitors. The institute also began preparations for the inaugural International Conference on Science and Technology for Economic Diversification (INSCITED) to be hosted in 2013 in collaboration with NISTADS.

NIHERST also strengthened its links with the Global Water Partnership-Caribbean (GWP-C) through a new project titled Environmental Solutions for Sustainable Communities, which promotes sustainable practices and environmental solutions in rural communities. The first phase focussed on water conservation and rainwater harvesting in water scarce areas. The project was successfully Implemented in Toco, Moruga and Barrackpore where it has reduced the need for truck borne water by participating schools and the dismissal of schools when there is no water.

The many achievements within our new and ongoing programmes in 2012 signal strong and steady progress towards the fulfillment of the goals set in the strategic plan to advance policy for research and investment, and boost public education, awareness and engagement in STI. Looking into the years ahead, we are confident in our capacity to continue to meaningfully impact Trinidad and Tobago's medium to long term development in STI across all strata and sectors of the national community.

Maureen Manchouk
President, NIHERST

At the 2012 national awards ceremony, NIHERST's President, Maureen Manchouck, was honoured with the Public Service Medal of Merit (Gold). In October 2012, at UWI St. Augustine's graduation ceremony, she will receive the Honorary Degree of Doctor of Laws (LLD).

Both awards are an acknowledgement of her groundbreaking contribution to building Trinidad and Tobago's scientific and technological capability and the important role that science popularisation plays in developing a national culture of science, technology and innovation.

NIHERST's venture into this area, which began in 1987, was Mrs. Manchouck's brainchild. It sprang from a small travelling exhibition of a few hands-on exhibits and blossomed over the decades into myriad programmes, bringing science alive for adults and students of all ages and promoting scientific and technological literacy and awareness. It was the start of a long journey of igniting curiosity, illuminating minds, and empowering our people to transform their lives and our society using science, technology and their innate creativity.

Mrs. Manchouck was undeterred by the lack of buy-in for science popularisation nationally, at a time when there was increasing investment in it around the world, particularly in the establishment of science centres. Through her vision, leadership, resourcefulness and single-minded persistence, the fledging programme survived and expanded to become the benchmark for science popularisation both locally and regionally, to the benefit of over one million children and adults.

In all other areas of NIHERST's pioneering work, Mrs. Manchouck also left a significant mark, especially in tertiary education, foreign language education, accreditation, policy research on science and technology, and strategic foresighting.

The NIHERST Board and staff join the people of this country in congratulating Mrs. Manchouck on her well-deserved honours. We thank her for her inspiring example, tireless championing of the cause of non-formal science education, outstanding public service, and her undefeated commitment to our progress in science and technology.

Changes in governing and reporting structures

In the 2012 period, two administrative changes occurred which affected NIHERST's governing and reporting structures.

Firstly, in June 2012 the present government established a new ministry known as the Ministry of the Science and Technology to which NIHERST now reports. This structural change was imperative given the dominant role that the development of the country's scientific, technological and innovative capacity plays in building a more diversified, competitive and sustainable knowledge-driven economy. At the helm of this new ministry is Dr the Honourable Rupert T Griffith, Minister of Science and Technology.

Approximately one month later, in July 2012, there was a change in the composition of the Board when Mr. Jwala Rambarran, financial economist and then Chairman of NIHERST Board of Governors, was appointed Governor of the Central Bank of Trinidad and Tobago. As a consequence Deputy Chairman, Prof. Prakash Persad became the Acting Chairman.

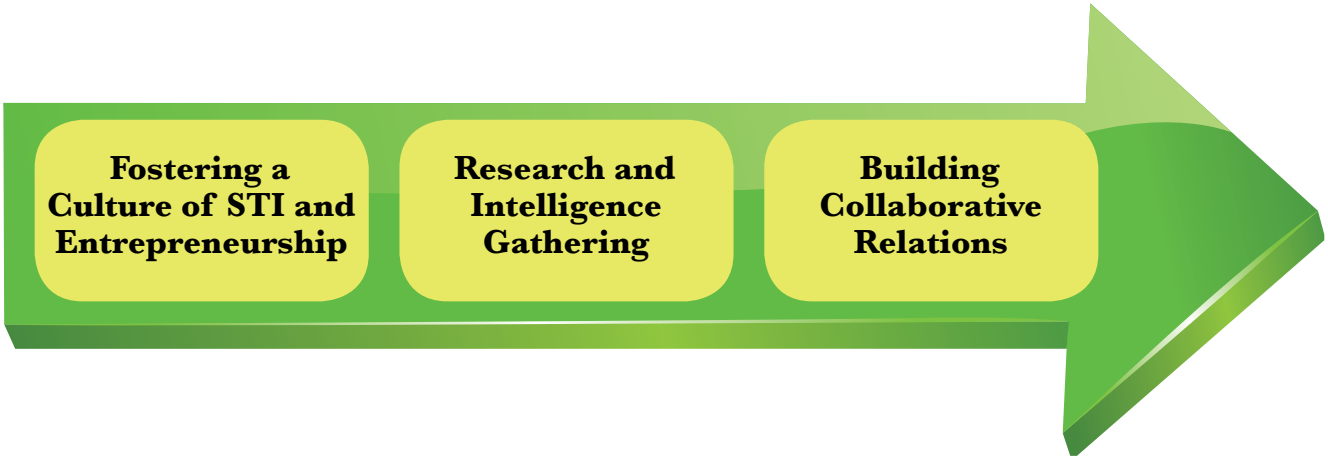
The NIHERST Board of Governors, initially appointed by the President of the Republic of Trinidad and Tobago in December 2012, now comprises 12 members including the NIHERST President as an ex officio member of the Board.

The membership of the Board is as follows:

Ag. Chairman	**Deputy Chairman**
Prof. Prakash Persad	Mr. Brian Juanette
Members	
Ms. Anisa Allaham-Hosein	Dr. Rawatee Maharaj-Sharma
Mr. Ralph Campbell	Ms. Denice Ramdhan
Mr. Cecil Caruth	Ms. Karen Rosemin
Mr. Raphael Esdelle	Mr. Andre Thompson
Mr. Brian Juanette	Mrs. Maureen Manchouck (ex officio)
Ms. Parbatie Helen Maharaj	

In the above picture, Dr the Honourable Rupert T Griffith (centre, back row) is seen alongside NIHERST's newly appointed Ag. Chairman, Prof. Prakash Persad (fourth from left, back row) and new Deputy Chairman, Mr. Brian Juanette (fourth from right, back row).

The NIHERST Strategic Plan Gains Momentum



In FY 2011, the firs t year of NIHERST's five-year strategic plan, the institute's programme of work focused on refining and expanding its core activities, all aimed at strengthening national capacity in science and technology to better support government's development agenda and, in particular, economic diversification. The critical strategic areas laid out in the plan for the advancement of the NIHERST mission are:

1. *fostering a national culture of science, technology, innovation and entrepreneurship, including an extensive science popularization programme and national awards schemes*
2. *undertaking strategic research and intelligence gathering in science, technology and innovation to support economic diversification and national advancement; and*
3. *promoting science, technology and innovation through the building of collaborative global relationships.*

The FY 2012 activities and achievements highlighted in the following pages build on the progress made in the first year of the plan. Some broke new ground; all enable the institute to continue its leadership role in national STI development, in accordance with its mandate.

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

Fostering a culture of creativity and innovation propelled by knowledge and advancements in science and technology is a complex and long-term development task that is best accomplished through a multi-pronged approach that more fully engages the diverse groupings within the national community.

Science Popularisation

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

NIHERST's science popularisation exhibits and activities use non-traditional educational approaches designed to make scientific concepts more easily understood and captivating to both children and adults, and to show their relevance and application in everyday life. Many programmes are also directly targeted at developing the creative and innovative capacity of our citizens.

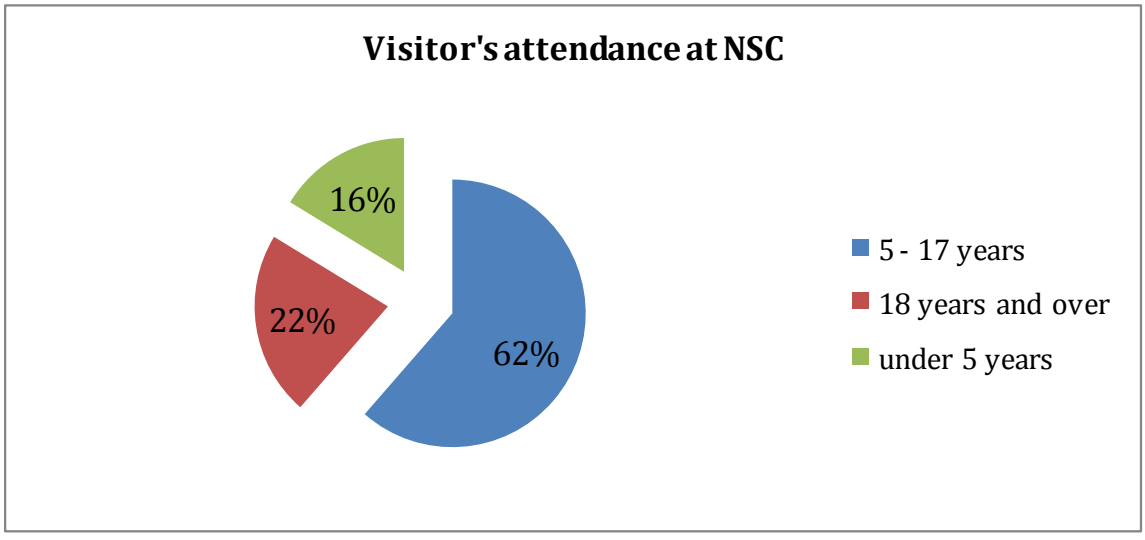
The National Science Centre (NSC) is the main vehicle through which the institute implements its rich and diverse science popularisation programme. Situated in D'Abadie on over 60,000 square feet of land, the centre holds almost 200 exhibits in thematic areas such as Animation, Astronomy, Energy, the Environment, Disaster Awareness, the Human Body, Sports and Wellness, Creativity and Innovation, Physical Disabilities and Robotics.

The centre offers a wide range of on-site and off-site programmes to raise the scientific and technological awareness, literacy and engagement of the general population, and specifically, to encourage more young people to pursue studies and careers in science and technology. Included in the offerings are: general and themed visits to the centre for exploring exhibits; vacation camps; workshops; competitions; road shows; outreach Community Science Weeks; the annual Caribbean Youth Science Forum (CYSF); and the biennial science and technology festival, Sci-TechKnoFest (STKF). The centre also hosts workshops for both teachers and students that directly relate to the science and mathematics curricula at primary and secondary school level.

For FY 2012, approximately 77,000 children and adults in Trinidad and Tobago benefited from NSC's programmes (in non-formal science education and the teaching of technological creativity, innovation and entrepreneurship ('technopreneurship').

Visits to the NIHERST/NGC National Science Centre

During the period, 15,662 children and adults visited the centre, engaging in various hands-on science and technological activities. Of those visitors, 61.4% were children between the ages of 5 and 17years, 16.3% were under the ages of 5 and 22.3% were persons 18 years and over, as shown in the chart below.



A visitor survey conducted during the period showed that 99% of respondents found their experience enjoyable, and 96% found the educational value of the exhibits to be above average (i.e. good or excellent), with the majority leaning towards excellent.

The survey results also depicted that 72% of respondents had visited the centre before, with 46% of this group of repeat visitors indicating that they had visited the centre more than twice before. This large pool of repeat visitors strongly demonstrates the institute's success in continually engaging visitors in the activities of the centre, as well as advancing the levels of scientific and technological literacy in the visiting population.

The National Science Centre continues to develop its resources in science and technology for the education and enjoyment of visitors of all ages, and especially to create fresh and exhilarating educational experiences for the younger age groups.

Caribbean Youth Science Forum (CYSF) 2012

CYSF is the leading and longest standing regional educational programme for nurturing the next generation of scientists and engineers. Held annually during the August vacation period since 1999, the forum targets lower sixth form science students from across the region. The forum aims to broaden students' knowledge, develop their creative thinking and problem-solving skills, foster in them a sense of pride in the region's scientific heritage; and awaken their minds to the potential and possibilities that lie before them through rewarding careers in science and technology.

Hosted for the 11th year in 2012, 195 students from Antigua, Barbados, Grenada, Jamaica, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago participated in an intensive week of activities on the campuses of The University of the West Indies (UWI), St. Augustine, The University of Trinidad and Tobago (UTT), O'Meara, and the NSC.

During the forum, students interacted with top scientists and engineers who delivered thought-provoking presentations on cutting-edge topics, from the origin of the universe and the space-time fabric to human genetics and the future of biomedical engineering, geoinformatics and designing buildings to mitigate the impacts of natural disasters.

The distinguished keynote speaker at this year's forum was Jamaica-born geneticist, Prof. Patricia De Leon, Trustees Distinguished Professor of Biological Sciences and Member of the University of Delaware Board of

Trustees, U.S.A. Her participation was sponsored by the US Embassy in Port-of Spain. Her opening ceremony address was titled: "Securing your place on the evolving scientific landscape in a knowledge-based society". She also delivered a public lecture on "The Human Genome Project and Its Impact". The other visiting speaker was Trinidad-born Prof. Stephon Alexander, a theoretical physicist at Dartmouth College, U.S.A., who gave a public lecture, titled, "The Cosmic Harmony: Where Does Matter Come From?".
Other highly regarded lecturers were: Dr. Shirin Haque, the first woman to head the Department of Physics at The University of the West Indies (UWI), St Augustine, who is well known for advancing the study of astronomy at the university; Mr. Mark Francois, a leading structural engineer with over 25 years' experience in the design and supervision of various structural and foundation systems; and Dr. Bhesham Ramlal, senior lecturer at Faculty of Engineering, The University of the West Indies (UWI), St Augustine and expert in geoinformatics.

Other core components of CYSF 2012 were:

- *field trips to 14 research institutions and S&T-based companies, where the students could science in action in and potential careers in the fields of human and veterinary medicine, chemical and mechanical engineering, manufacturing processes, marine and agricultural science, zoology and botany;*
- *a Design Challenge competition in which the teams from each school were required to use scientific know-how, creativity and innovative abilities to design and build a glider; and*
- *an evening event called "Socializing with Scientists", which gave participants one-on-one time with 17 of the country's top scientists and professionals in academia, government and industry, to discuss career opportunities and challenges of their chosen fields, share their life experiences and give guidance and advice.*

A new forum component entitled Science HardTalk was introduced in 2012. Patterned after the BBC's flagship program, HARDtalk, Science HardTalk enabled students to pose thought-provoking questions to experts in various scientific fields. With the assistance of a moderator in each of the two sessions held, Prof. Patricia DeLeon and Dr. Brian Cockburn unravelled the science and ethics of the human genome, and Prof. Stephon Alexander and Dr. Shirin Haque demystified the world of quantum mechanics which is included discussion on the newly discovered Higgs' Boson particle.

At CYSF, students benefit from a first-rate science education experience which provides the right mix of academic, social and cultural activities for their holistic development, and shaping their sense of identity as the region's future leaders in STI.




Community Science Weeks

Community Science Weeks have been a core part of NIHERST's science popularization efforts since 2003 and is a key outreach activity. They serve rural and underserved communities in Trinidad and Tobago by literally "taking science to the people". As the name implies, every science week is owned by the particular community - tailored to meet its unique needs and demands and characterised by a large degree of involvement by community stakeholders in its planning and execution.

In FY 2012, NIHERST hosted two very successful science weeks in the rural communities of Preysal and Tabaquite during the period November 7th to 12th 2011 and February 6th - 11th 2012 respectively. The events featured interactive exhibit areas, media library activities, an astronomy night for viewings of the night sky through high-powered telescopes, science workshops and a career day. Some of the topics covered were: environmental conservation, health and wellness, agricultural development, climate change, entrepreneurship and disaster preparedness.

Preysal Community Science Week

Hosted at the Preysal Secondary school, 4,000 children and adults - from the catchment areas of Gran Couva, Mc Bean, Freeport, California, Rivulet Road, Waterloo, Carapichaima and Preysal - explored science and technology in new and exciting ways.

Tabaquite Community Science Week

This event was hosted at the Tabaquite Government Secondary School and also attracted close to 4,000 children and adults from the catchment areas of Gran Couva, Piparo, Eckel Village, Brasso, Hardbargin, Willliamsville and environs.

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

Through the work of its Innovation Unit, NIHERST has made significant advances in developing the creative and innovative capacity of our citizens, and young people in particular. The unit's activities are in three core areas: educational programmes of the Robotic and Creative Design Labs, the Community-Centered Design and Innovation (COMDESI) training programme, and vacation camps in creativity and innovation.

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Robotic and Creative Design Labs

The Robotic and the Creative Design Labs at the National Science Centre offer hands-on activities in robotics, electronics, innovation and 'technopreneurship' through outreach activities, workshops, camps, clubs and visitor rotations. In 2012, 15,760 students and adults engaged in these activities as follows:

Visitor rotations: 10,400 children and adults took part in creativity, innovation, AutoCAD, and robotics activities at the two labs. A number of high profile persons, who also visited the labs, were impressed with both the facilities and the programmes on offer. These individuals included senior officials and technical staff of the National Council of Science Museums (NSCM) in India and Makerere University in Uganda; and senior science educators and administrators from other Caribbean countries.

Student Outreach: 4,200 students from 29 primary and secondary schools engaged with the robotics, electronics and AutoCAD exhibits and activities at the community science weeks in Preysal (Nov 2011) and in Tabaquite (Feb 2012). During these events, students were immersed in hands-on science learning in new and exciting areas that brought science concepts in the school curriculum more alive.

In addition, 720 students from 33 secondary schools (forms 2-5) in Victoria, Caroni and Mayaro/Nariva benefited from workshops in robotics and electronics, which were conducted during the second quarter of 2012. In the robotics workshop, students mastered the science of robotics, building and programming their own autonomous robots. In the electronics workshop, students learnt about circuits; basic measuring instruments; Faraday's Law and transformers; and power generation and distribution, which enabled them to build from scratch and test a working speaker.

Camps

Vacation camps in Science, Technology, Innovation and Invention

NIHERST offers an expanding range of camps during the July/August vacation period targeting young people between the ages of 5 and 17. The science camps focus on scientific principles and concepts while the others expose children to the applications of science and the basics of the innovation process and entrepreneurship ('technopreneurship'). Camps were held in five locations in Trinidad: east (NSC), north (St. Francois Girls' College), south (UTT Campus, San Fernando), deep south (Debe High School), and central (Preysal High School).

Science Camps: Two 1-week science camps, which each ran for four cycles over the period July 18th to August 19th 2012, were conducted at NSC. These were: Sci-Spy for children 7-9 years, and Eureka! for the 10-12 age group. The topics and educational content covered in the camps were tailored to suit the different age groups. The topics included: Infection Connection, which focused on Public Health/Virology/Microbiology; Amazing Earth, exploring Geology/Geomorphology; Rocketeers, looking at Space Exploration/Solar System; and Cool Contraptions, demonstrating principles of Mechanical Engineering and Innovation.

The science camps were enjoyed by a total of 231 campers of whom 58% were male. 116 children participated in the Sci-Spy camps and 85 children in the Eureka! camps. In Tobago, the Eureka! camp ran for the first time from July 30th to August 4th 2012. Held in Mason Hall Government Primary, the science camp ran at targeted capacity.

Tech Camps: Three tech camps were held at NSC during the 2012 July/August vacation period. These were: e-Magination, developed for the 7-11 age group, and Photoshopping Spree and Java Tech, for the 12-17 age group.

In total, 56 persons explored the world of computer programming, covering cutting edge areas such as Scratch Animation (basic level); App development for Blackberry and Android systems, games creation and development; and 3D animation.

A total of 425 children between the ages of 5 and 17 attended the under-mentioned camps in science, engineering, creativity and innovation.

Young Inventors: In this three-week camp, the children looked at principles in civil and mechanical engineering (concepts in physics for the design and construction of buildings, roads, bridges and dams, the physics of materials and moving mechanical systems, electronics, electricity and renewable energy). They were also taught AutoCAD. Campers were required to design and build a model sustainable future town/city working with a fixed budget and a set physical environment. The towns were powered using renewable energy sources; showed good zoning and had well planned and constructed water and sewage lines, roads, bridges, houses and industrial buildings. In the process of doing their project, campers learnt skills in project management, team-building, leadership and presentation.

Robotics Camp: Also three weeks long, this camp introduced participants to the theory of robotics, the basics of a robotic kit and the programming of robots and engaged in designing, building and programming their own battle robots, automated robotic dump truck, and robotic stair crawler. Campers had the challenge of designing and constructing an autonomous "Stair Master" using the Lego Mindstorm NXT 2.0 kits. It was evident that campers enjoyed the activities as many students asked their parents/guardians to buy them robotic kits for their birthday/Christmas presents!

Explorer Camp: This was a week-long camp, which immersed the participants in the problem-solving world of science and engineering. They explored concepts to build the Eiffel Tower, power our world, and delight persons with sound and music. Innovative and creative challenges were given from the start and children were provided with everyday items to test basic engineering principles in civil, electrical, mechanical and aeronautical engineering, as well as in sound, health and safety. Campers also worked in teams and constructed items such as towers, racing cars, planes, and rockets, which was followed by exciting challenges to test the items made. It was evident that the campers had an enjoyable learning experience and walked away with an awakened interest in the field of engineering and applied science as many of them returned home daily and built from scratch the creations made during the day. As a consequence, the majority of parents were satisfied with the camps.

Funology Camp: Geared towards having fun with learning, exploration and team work, children in this one-week camp delved into the world of insects and pollination; meteorology and the weather; the properties of water; the water cycle and water conservation, electricity, wind energy; nutrition and fitness, and robotics and technology. Campers made weather instruments, wind machines and a robotic arm. Parents expressed their satisfaction with the camp content in that their children were able to remember and share all that they learnt and made during the day.

Clubs

The various clubs provide opportunities for students to expand and deepen their knowledge of scientific concepts through life-long, passion-based science learning.

Science Club: NSC Science Club meets for two hours on the second and fourth Saturdays of each month during the school term. It caters to two age groups: Juniors 9 to 12 years and Seniors 12+ years. As of FY 2012, the Club has enrolled 132 juniors and 170 seniors, a total of 302 persons, which represents more than a 150% increase in membership from the previous year. Meetings engaged members in a variety of hands–on interactive activities on topics such as the water cycle, the science behind carnival (wire bending), kitchen science, acids and bases, introduction to lab equipment and fun experiments (for juniors); and simple machinery, ancient mathematics, electrolysis and design challenges (for seniors).

The activities of the Science Club culminate at the end of each calendar year with an enlightening, science-rich theatrical production referred to as Christmas at the Science Centre. Christmas at the Science Centre uses theatre to reinforce science learning among members of the Science Club. It creatively connects science with the arts and uses theatre as a teaching and learning tool. On December 17th 2011, 32 club members staged a 45-minute play entitled "Christmas at the Watts". This entertaining theatrical production included singing, instrumentals, acting, narration and science demonstrations to highlight concepts such as chemical reactions, energy, circuitry, sound waves, and gesture recognition technology.

Astronomy Club: The activities of the Astronomy Club were limited for the financial year because of unpredictable weather conditions. However, astronomy viewings were held at both the Preysal and Tabaquite Community Science Weeks, attracting 500 visitors. Yuri Night observance, hosted at the National Science Centre on April 27th 2012, was attended by 250 people.

Sci-Eng Club: This was launched at Debe High in January 2012 for forms 1-3 students. The 28-member club (15 boys and 13 girls) benefited from the hands-on activities that reinforced concepts in the lower secondary school science curriculum. Topics covered included: simple machines, circuits, motors, and measurements and units.

The Robotics Club: Established in 2008, and with a current small membership of 10, members worked on designing and programming a Rube Goldberg machine.

India: A Culture of Science Exhibition

The hosting of this large scale visiting international exhibition was in keeping with NIHERST'S strategic goals for science popularization and wider mission to help develop a national scientific ethos and nurture citizens who are scientifically literate, innovative and empowered to use STI in daily living. India's emergence as a global economic giant in a relatively short time rests heavily on its cutting-edge advancements in science and technology. In showcasing the story of India's rich "culture of science", the exhibition was intended to serve as a mirror and

inspiration to our people to understand the importance of our own scientific and technological development - the new imperative and the possibilities for Trinidad and Tobago, as it strives to diversify the economy through knowledge and innovation.

The then Minister of Science, Technology and Tertiary Education, the Honourable Fazal Karim in his opening remarks at the opening ceremony of the exhibition on May 21st 2012, stated, "There is, in the final analysis, no such thing as Indian Science. No Chinese or German or American science. There is only science – that pure universal knowledge that transcends all socio-cultural boundaries, to be discovered and accessed by all."

The exhibition took place from May 21st – July 20th, 2012 at Divali Nagar, Chaguanas. It represented the first of its kind on two fronts. It was the first national science exhibition showcasing inventions/advances of a country/region based on the application of science and technology. It was also the first fruit of collaborations established between NIHERST and India's National Council of Science Museums (NCSM), following the signing of the Memorandum of Understanding (MOU) between these agencies in New Delhi, India on January 10th 2012.

The exhibition gave a panoramic and breath-taking view of scientific discoveries and technological advancements in that country, from the earliest centuries to today. It showcased breakthroughs and developments in a breadth and range of scientific topics and its diverse contribution to humanity's development over 7000 years. The panoply of exhibits, models, artefacts, graphic displays and multimedia games and videos took visitors through the discoveries and inventions of antiquity to the world renowned, specialised skills of traditional craftsmen and the cutting-edge science and technology that have enabled India to emerge as an important global economic power.

The exhibition attracted over 51,000 visitors who came from all areas of Trinidad and Tobago, but especially from the regions of Couva/Tabaquite/Talparo (20%), Chaguanas (17%) and Tunapuna/Piarco (10%).

Visitor responses to evaluation surveys conducted during the exhibition showed that the overwhelming majority of visitors felt the exhibition met and surpassed their expectations. In particular,

- *99% of the visitors enjoyed the exhibition;*
- *96% of the visitors reported that the exhibition's content was understandable; and*
- *91% of the respondents indicated that the exhibition increased their knowledge of S&T.*

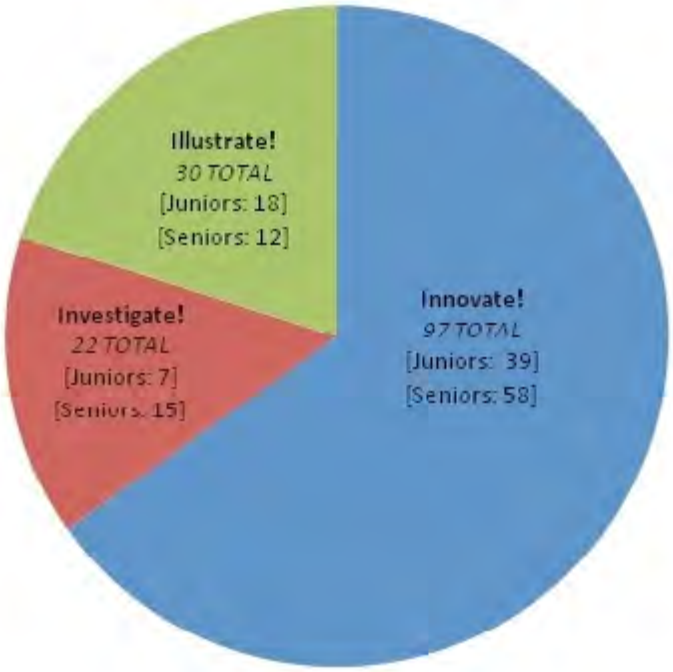
Science Whizz Competition 2012

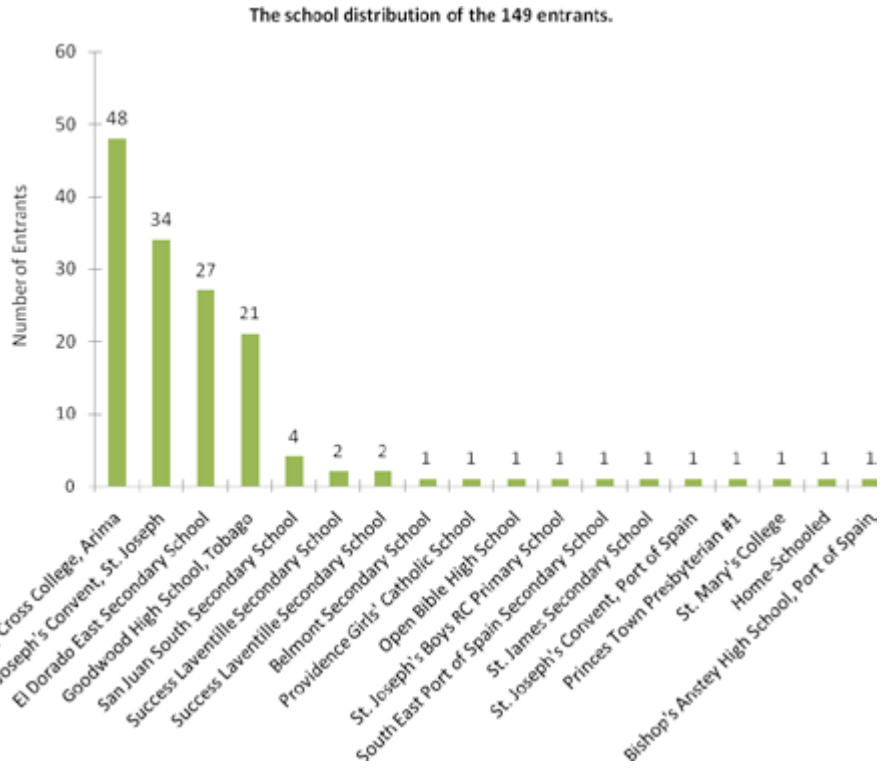
The Science Whizz competition is an annual schools competition which has as its themes Illustrate, Innovate and Investigate. The competition challenges students to explain science and math concepts in fun ways; to innovate using a given set of materials; and to investigate defined problems. These three competition categories are further subdivided into two age categories – junior entrants 12-14 years and senior entrants 15-18 years.

Representing a 10% increase in entrants from the prior year, a total of 149 persons exuberant entrants competed in 2012.

Notably, 65% of entrants took part in the Innovate category while the remaining entrants were equally shared between the other two categories; Tobago was strongly?? represented in the competition through Goodword High School (see charts below).

The distribution of the 149 entrants across the three competition categories.





The finals of the 2012 Science Whizz competition took place in December. Appendix I gives the list of competition winners.

Teacher & In-house Training Workshops

In January 2012, a robotics workshop was hosted by the Robotics Lab, in collaboration with UWI's Department of Electrical and Computer Engineering, to support curriculum officers in the development and implementation of robotics activities into the Science and Technology Education curriculum. Approximately 50 educators too part.

Also in June, before the start of the July/August camps in creativity and innovation, Dr. Ed Sobey from the Northwest Invention Centre in the US facilitated two 2-day workshops on the teaching of scientific ingenuity for NSC instructors, camp counsellors and educators from the Ministry of Education. The training was hands-on and showed the many ways that students could be involved in creative design and problem-solving applying scientific concepts. Sixty (60) persons benefited from this activity.

Community-Centered Design and Innovation (COMDESI)

COMDESI, undertaken by NIHERST in collaboration with the Heroes Foundation, provides students with an opportunity to engage with local communities and develop innovative solutions to real life community problems. The project develops students' capabilities in civic engagement, problem solving, critical thinking, team work and design and innovation, and helps to better prepare them for the world of work and to take action to address community issues. The project has at its core a well-structured training programme that includes timely interactive and hands-on learning sessions throughout the community experience in areas such as innovation, invention and "technopreneurship", AutoCAD, civic engagement, teamwork, leadership, prototyping, electronics, report writing and presentation skills. The students also meet with representatives from the targeted communities to better understand their specific issues and needs.

In FY 2012, over a 9-month period, the third cycle of the project was held for a group of 40 secondary school students from five schools - Bishop's Centenary College, Belmont Secondary School, St. Francois Girls' College, Barataria North Secondary and South East Port of Spain Secondary. The targeted communities were: the Combined Disabilities of Trinidad and Tobago, the Blind Welfare Association, the farming community, All Saint's

Gordon Home for the Aged and Dee's Nursing Home. The teams worked feverishly and devoted their Saturdays, Easter and July/August vacation periods to conceptualising innovative and workable solutions to community problems. Their solutions addressed the visually impaired community's desire for a standardized tactile map; the farming community's need for a multipurpose farming tool; the difficulty that the elderly have using toilets; and problems facing wheelchair-bound persons and their caregivers.

The project cycle ended on December 15th 2011 with an awards ceremony at Hotel Normandie during which team projects were judged. 25 secondary school students received prizes for their prototypes and innovative ideas. The winning teams for the top three prizes of Best Prototype, Most Innovative Design and Leading Team in Community Engagement were:

Prize	Name of winning team and its members	Team project
Most Innovative Design	G6 (Aaliyah Marshall, Anella Tobitt, Jada Gooding, Rosemary Gonzales, Shernecia Gonzales)	Textured Braille Key to support Braille maps
Best Prototype	Protons (Brittany Cochrane, Moesha Franklyn, Samantha Baptiste, Nirvana Boodram, Shaquille Mendez)	Modified wheelchair which includes additional braking system to assist persons using wheelchairs on an incline.
Leading Team in Community Engagement	Innovative People (Vashti Nandalal, Oulervia Phillip, Joanna Fiddler, Bethula Lord, Akkilah Archer)	Adjustable Toilet Seat (ATS) to assist elderly persons who are unable to bend properly.

At the awards ceremony, students attested to the importance of COMDESI by expressing their gratitude for being able to be of service to others, and indicating that the experience was unforgettable and the technical and life skills developed would help them throughout their lives.

Science popularisation through print and electronic media

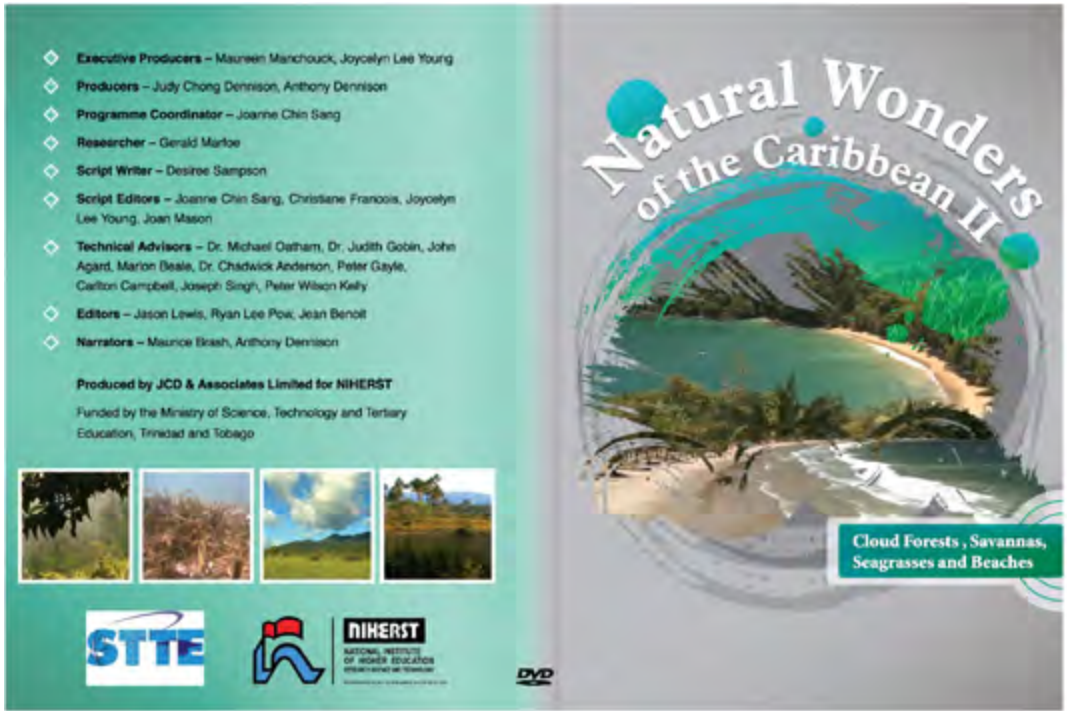
In addition to the face-to-face interactive science popularisation activities conducted by NSC, NIHERST also continued its work in popularising science through print and electronic media through four projects: the Natural Wonders of the Caribbean series (Part 2), an animated video on oil spills, Eco-ribbean, and NIHERST's Science Music Video Competition.

The specific objective of these projects is to educate the general public and students about selected environmental issues/problems and promote actions that will help overcome these problems and advance ecological sustainability. Underpinning this are the institute's primary objectives of promoting basic scientific knowledge and literacy of key scientific concepts and terms, and encouraging students in their studies of the environment and careers in this field.

Natural Wonders of the Caribbean (Part 2) video documentary series

Following on the publication of the first video in this educational video documentary series, another DVD was produced and launched featuring beaches, seagrasses, cloud forests and tropical savannahs. These videos were subsequently distributed to all local television stations and one Caribbean television station, where they are aired periodically.

The material was also distributed to local non-profit environmental bodies with a public educational outreach role and also uploaded onto the NIHERST YouTube channel.



Oil Spills Video Animation

In the FY 2012, the oil spills video animation, featuring the "pirates of the Caribbean" from NIHERST's 2009 animated video on volcanoes, was completed and disseminated through the same media channels as the Natural Wonders series.

Eco-ribbean – A Climate of Change

This is an exciting interactive resource on climate change. It is geared towards the general public but with a focus on secondary schools students. It contains captivating games, simulations, and stunning videos and photos that facilitate our understanding and deepen our knowledge of climate change, particularly as it impacts our region. This compelling multi-sensory DVD-ROM was developed by NIHERST with the support of the United Nations Development Programme (UNDP) in Trinidad and Tobago and the Caribbean Council for Science and Technology (CCST). It was completed in 2012, along with a plan for targeted distribution and promotion in 2013.

NATIONAL AWARDS AND COMPETITIONS

Awards for Excellence in Science and Technology

In October 2011, NIHERST with the support of the then Ministry of Science, Technology and Tertiary Education and the Caribbean Academy of Sciences (CAS), re-launched the NIHERST Awards for Excellence in Science and Technology. The scheme recognises and rewards nationals for outstanding achievements in science and technology and comprises awards in engineering, natural sciences, medical sciences, applied science and technology, and technological innovation in arts and culture, as well as two new awards for Junior Scientist and Junior Engineer aimed at persons under the age of 35 with exceptional abilities and achievements.

In March 2012, 51 nominations were submitted. Following a rigorous selection process, the gala awards ceremony on September 29th 2012 honoured 17 scientists for their world-class contribution to science and technology in Trinidad and Tobago and/or overseas. The top five awardees were:

The Rudranath Capildeo Award for Applied Science & Technology

- ***Prof. Neela Badri:*** *microbiology (specialising in food science and technology)*
- ***Prof. Anil Kokram:*** *electrical and computer engineering (specialising in signal processing)*

The Julian Kenny Award for Natural Sciences

- ***Prof. John Agard:*** *environmental management and sustainability*

The Emmanuel Ciprian Amoroso Award for Medical Sciences

- ***Prof. Vijay Naraynsingh:*** *medicine (specialising in surgery)*

The Fenrick De Four Award for Engineering

- ***Prof. Clement Sankat:*** *mechanical engineering (specialising in agricultural engineering).*

The listing of the other 12 awardees is as follows:

- **Prof. Stephon Alexander - theoretical physics**
- **Dr. Stephen Blizzard - aviation medicine**
- **Prof. Brian Copeland - electrical engineering/Innovation**
- **Dr. Wayne Frederick – medicine (oncology)**
- **Dr. Indra Haraksingh – physics and renewable energy**
- **Dr. Patrick Hosein - electrical engineering and computer science**
- **Professor Aftab Khan – geophysics**
- **Dr. David Prevatt - civil engineering**
- **Prof. Indar Ramnarine – applied ichthyology/aquaculture**
- **Prof. Samuel Ramsewak - medicine (obstetrics and gynaecology)**
- **Dr. Sanjeev Seereeram - computer and systems engineering**
- **Ms. Jo-Anne Sewlal – zoology (The Frank Rampersad Award for Junior Scientist)**

These scientists will also be featured in the next volume of NIHERST's series of publications entitled **Trinidad and Tobago Icons in Science, Technology & Innovation.**

These awards and publications play a unique and important role in raising the visibility of the country's often unsung and unknown scientific minds; recording their contribution to Trinidad and Tobago's scientific heritage; providing positive role models for our youth to emulate and be inspired to pursue careers in science and technology.

Prime Minister's Awards for Scientific Ingenuity

In 2012, NIHERST also prepared for the launch of The Prime Minister's Awards for Scientific Ingenuity, to take place later in the year in the next FY. The awards will be offered on the basis of two competitions: the Scientific Creative Solutions Competition and the Scientific Innovation & Invention Competition. They will be promoted nationally using traditional and non-traditional media, as well as sensitization workshops at five venues throughout the country, and road shows at educational institutions.

NIHERST Science Music Video Competition

The NIHERST Science Music Video Competition was launched in June 2012. Unlike the educational material produced in-house by NIHERST for the public, this competition challenges youths between the ages of 14 and 28 to create music videos of their own that show the central role of science, technology and innovation (STI) in development. It is intended that the resulting productions will be promoted on social media platforms and also played at NIHERST events to communicate scientific information in an attractive and appealing way, and engage a broad range of viewers, and above all, our youth.

Over 150 persons throughout Trinidad and Tobago responded enthusiastically to call to submit their concepts. To assist entrants in the development of their videos, a 3-day training programme was conducted at five locations in Trinidad and Tobago in north, south and central Trinidad and in Tobago. Topics covered in the training included: intellectual property, science communication and music video production. The training equipped participants with the basic knowledge and skills required to conceptualise and produce creative music videos that would effectively communicate STI.

Twenty very diverse and informative music videos were submitted by the competing teams (totally 27 persons) for final judging. The videos, with catchy tunes and captivating footage, covered topics such as climate change, deforestation, noise pollution and other types of pollution, renewable energy, disaster preparedness, food security and biomedical engineering, while varying in musical genres from soca to hip hop to hard rock. Entries were judged by five independent experts. The competition was initially designed to award the top three entries plus three special prizes. However, due to the high standard of the submissions, a total of over $100,000 in prizes was issued to reward and further encourage all teams for their hard work and creativity. The list of winners can be viewed under Appendix II.

Strategic Goal 2: Research & Intelligence Gathering

One of the key aims of the strategic plan is to strengthen NIHERST's research and intelligence gathering capability to better support economic diversification through clear policy direction supported by data.

This is being realised through the work of two units - the S&T Statistical Research Unit, which conducts surveys on STI and analyses the collated data to inform S&T policy formulation and planning, and the recently established Research and Intelligence Gathering/Policy Development Unit, established in the last quarter of 2011, to undertake international benchmarking and comparative studies on STI and to provide policy support and advocacy in developing a national STI policy.

STI Policy Development

In November 2011, staff of the Research & Intelligence Gathering/Policy Development Unit attended and presented at an international conference, Science, Technology and Innovation in the Globalizing Environment, held in New Delhi, India and hosted by the National Institute for Science, Technology and Development Studies (NISTADS). During the conference, NIHERST representatives also met with several NISTADS officials and researchers. This timely exchange led to the signing of a memorandum of understanding (MOU) between NIHERST and NISTADS in January 2012 in India. The MOU will facilitate future collaboration on the hosting of joint conferences on science and technology, development of joint research programmes and assistance with the development of a national science and technology policy.

Centre: Senator The Hon. Fazal Karim, then Minister of Science, Technology and Tertiary Education (MSTTE), signing the MOU at NISTADS. L to R: Jaggernauth Soom (Permanent Secretary, MSTTE); Jwala Rambarran (NIHERST Chairman); Navneet Boodhai (Advisor to Minister Karim); Curtis Manchoon (then UTT Chairman) and Dr. P. Banerjee (NISTADS Director)

By the first quarter of 2012, the unit had already commenced work on the development of a national science and technology policy to be completed in FY 2013. Staff developed a policy brief as a base document for national stakeholder consultations. In addition, in preparation for the consultations, the unit held weekly planning meetings with representatives from the then Ministry of Science, Technology and Tertiary Education, as well as discussions with the Trinidad and Tobago Chamber of Industry and Commerce (TTIC) to acquire input from the private sector. The latter has resulted in private sector buy-in demonstrated by the ongoing and wide-ranging contributions of TTCIC's technical staff.

S&T Statistical Research

NIHERST's S&T Statistical Unit is the sole regional facility dedicated to collecting and analysing S&T statistics for the benefit of policy analysts, researchers, educators, entrepreneurs, decision-makers and other international data collecting agencies. In operation since 1996, the unit has been responsible for issuing over 25 sector-relevant surveys and publications.

For the FY 2012, three surveys were conducted:

- *a new survey entitled Survey of Innovation in the ICT Sector, 2012;*
- *the Survey on Public Perception of Science, 2012 which was only once before conducted in 2005, and the purpose of which is to measure changes in attitudes toward science; and*
- *the Survey of Science and Technology (S&T) Indicators, 2011. This survey is conducted annually in order to develop and maintain a reliable time series of S&T indicators on expenditure and manpower based on data collated from higher education and research institutions and public sector establishments.*

The unit also published the results of the following three surveys conducted in the previous fiscal year:

- *the Survey on Science in Secondary Schools, 2011;*
- *the Survey of Innovation in the Publishing, Printing and Paper Converter Industry, 2010; and*
- *the Survey of Innovation in the Tourism Sector.*

500 copies of each were printed for distribution to government ministries, research institutes and national libraries.

Strategic Goal 3: Building Strategic Alliances

CaribbeanTales Film Festival

An unexpected favourable outcome of **the Caribbean Science and Agriculture Film and Video Competition** held in the previous year by NIHERST in partnership with CCST, CTA ACP-EU, CARDI, UWI and the Trinidad & Tobago Film Company, has been the regional showcasing of the competition's films at the six-day CaribbeanTales Film Festival, held in Barbados in April 2012 by CaribbeanTales Worldwide Distribution Inc. NIHERST, in collaboration with CCST and CTA, provided financial support to the festival and gave two video competition finalists the opportunity to attend the event.

Caribbean Research Innovation and Entrepreneurship Network (RIENet)

NIHERST, in collaboration with CCST, was granted approval from CTA to continue the development of RIENet for another 12 months. The aim of the network is to build a virtual community of interest that encourages the sharing of experiences, the transfer of 'know how' and the provision of role models to encourage a new generation of entrepreneurs and innovators, in Caribbean countries.

A total of 72 articles were uploaded to the www.rienet.net website during the reporting period. The number of registered RIENet members has now increased to 458 with a further 155 who are registered as 'fans' on RIENet Facebook.

Caribbean Wide Elaboration of Collaboration Schemes (Caribbean WELCOME)

This is an EU project initiated in ??, of which NIHERST and CCST are associates and not project owners or leading partners. A major component of the Caribbean WELCOME project was an assessment of at least 60 firms/organizations in three Caribbean countries - Trinidad and Tobago, St Lucia and Jamaica - addressing issues of the supply of services, diffusion of knowledge and technology transfer for companies and institutions in the region. The project has investigated and reported on the research, development and innovation needs of businesses within the region; the extent of industry-science relations and the barriers and drivers of such cooperation; and the quantity and quality of support services available for innovation and innovative activities of regional firms. This project will provide valuable information for NIHERST's STI projects and, on a larger scale, will contribute to improving the competitiveness of businesses and, by extension, country competitiveness.

Eco-Solutions: Environmental Solutions for Sustainable Communities

NIHERST has had a strong relationship with the Global Water Partnership (GWP) and its regional arm, GWP-C. The two agencies have collaborated on public education initiatives to promote regional water security. Springing from these activities, the institute piloted a local project at the beginning of FY 2012, to encourage sustainable practices and environmental solutions in rural communities. The first phase has focused on building awareness around water conservation and rainwater harvesting; empowering communities to take action to conserve water; and providing education and training on the installation of the GWP-C's low cost rainwater harvesting (RWH) model – a technological solution specifically developed for the Caribbean to address the issue of water scarcity. The aim is for the project to both solve an environmental issue facing the communities through the application of a technological solution, and increase the income earning capacity of trained members of the community by providing them with an additional skill.

The project was very successfully implemented in Toco, Moruga and Barrackpore, reducing the need for truck borne water and the impact of water shortages on schools. In 2012, over 2500 students from 11 schools had benefitted from the education programme; 30 persons were trained to install the harvesters; and 9 schools were outfitted with the rainwater harvesters.

In 2012, the project targeted three communities - Toco, Moruga and Barrackpore. Community meetings and stakeholder sessions were held to finesse community needs and identify the schools which would best benefit from this initiative. Eleven schools were eventually selected – five each from Toco and Moruga and one from Barrackpore. Public awareness sessions on water conservation and rainwater harvesting were then conducted at the 11 schools. This was followed by education and training on the installation of the GWP-C rainwater harvesting model by an expert facilitator for interested community members. The training involved both theoretical and practical components leading to the installation of the RWH model by the trainees. The completed installations were publicly commissioned at the graduation ceremonies held for the trained persons in each community. In addition, one school - the Rochard Douglas Presbyterian School in Barrackpore - benefited from NIHERST's purchasing of solar panels and solar panel installation, outfitting it to serve as a disaster shelter. As a result, the school now has an additional feature of a solar system to power its staff room as well as equipment that is necessary in the event of a disaster such as a refrigerator for the storage of medicine, outdoor and indoor lights and charged cell phones, radios, computers and laptops.

The impact of this project has been far reaching.

- *Over 3,000 adults and students from the communities walked away with a heightened awareness/ knowledge and understanding of (key scientific concepts and terminology on) water conservation and rainwater harvesting.*
- *75 community members (25 from each of the 3 communities) were trained in the installation of rainwater harvesting model.*
- *In addition to the education and training objectives being met, employment opportunities arose for 67% of the trained members as the Toco and the Moruga groups were contracted outside the project to install harvesters.*
- *9 schools (1-Barrackpore, 4 Moruga and 4 Toco) have been outfitted with RWH systems to address water scarcity; and there has been a 50% decrease in the need for truck borne water by the selected schools.*
- *The Rochard Douglas Presbyterian School is now the first renewable energy powered disaster shelter in Trinidad and Tobago.*
- *Moreover, the Ministry of Education has expressed interest in having the initiative extended to other schools that are continuously closed due to lack of water.*

NIHERST foresees considerable scope and possibilities for expanding this project into many communities across Trinidad and Tobago.

ECO-SOLUTIONS: Public outreach on water conservation at schools within selected communities

Installation of the Rainwater Harvesting Model at the Rochard Douglas Presbyterian School, Barrackpore

Solar panel installation for disaster shelter at the Rochard Douglas Presbyterian School, Barrackpore

Recent Publications and Videos

Pubications (2010-1012)

2012

"Economic Priority Areas, Jobs and Skills for Growth in Trinidad and Tobago"
by Sandra Sookram, Ph.d. (Econ.) for NIHERST 2012.

"Eco-ribbean - A Climate of Change"
Recorded 2012 by Silvacode for NIHERST. © NIHERST 2012. DVD

"Cloud Forests, Savannas, Seagrasses and Beaches." Natural Wonders of the Caribbean II
Recorded 2011 by JCD & Associates Ltd for NIHERST. © NIHERST 2012. DVD

2011

Innovation in the Publishing, Printing & Paper Converter Industry, 2010
National Institute of Higher Education, Research, Science and Technology. Port of Spain: NIHERST, September 2011. 77 p

NIHERST's Children's Science Magazine: Issue 6: Iggy at the Village Olympics
July 2011

Survey of Innovation in the Tourism Sector, 2009
National Institute of Higher Education, Research, Science and Technology. Port of Spain: NIHERST, July 2011. 141 p

Caribbean Women in Science and Their Careers
National Institute of Higher Education, Research, Science and Technology. Port of Spain: NIHERST, August 2011. 90 p

2010

Survey of Innovation in the Chemical and Non-metallic Products Industry, 2009
National Institute of Higher Education, Research, Science and Technology. Port of Spain: NIHERST, September 2010. 64 p

Survey on the Utilisation of Information Technology by Households, 2009
National Institute of Higher Education, Research, Science and Technology. Port of Spain: NIHERST, June 2010. 69 p

Caribbean icons in Science, Technology and Innovation: Volume 2
Caribbean Council for Science and Technology. Port of Spain: NIHERST, 2010

Video (2010-1012)

2012

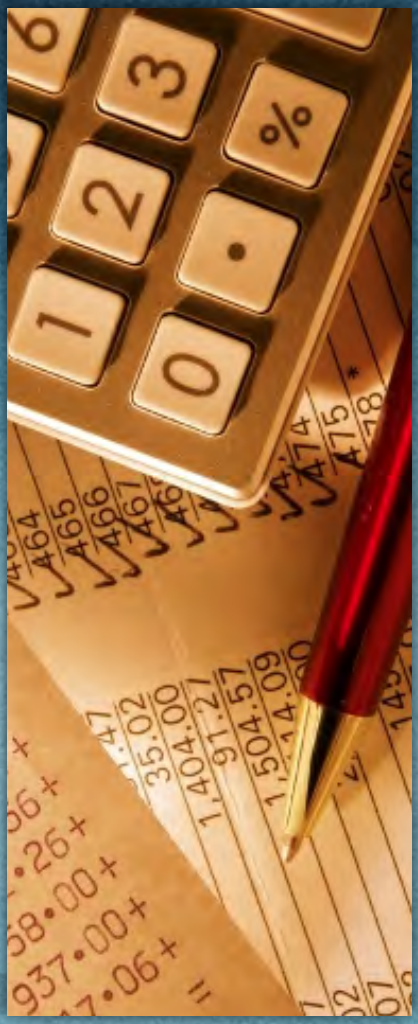
Natural Wonders of the Caribbean (Part II): Cloud forests, Beaches, Tropical savannas and Seagrasses

Animation on Oil Spills

2010

Disaster Awareness (3 features): Floods, Forest Fires and Landslides

Animation on Volcanoes



Financial Report

The Financial Statements for the years ended December 31, 2010 and 2011 have been submitted for audit to the Auditor General's Department.

NIHERST

Annual Report | 2012

BALANCE SHEET
AS AT DECEMBER 31, 2012

	NOTES	2012 $	2011 $
FIXED ASSETS	5	2,101,952	2,820,327
CURRENT ASSETS			
Fixed Deposit		2,436,316	2,421,817
Interest Receivable		10,284	10,206
VAT Receivable		3,993,951	2,209,559
Debtors		6,951,791	3,185,017
Prepayments		338,985	323,726
Suspense		20,161	10,933
Cash at Bank		12,768,994	11,429,648
Cash in Hand		8,000	8,000
Pension Plan Assets		3,347,000	3,325,000
		29,875,482	22,923,906
LESS CURRENT LIABILITIES			
Accrued Expenses		2,048,508	237,456
Suspense		0	0
Creditors		766,672	472,046
Deferred Income	6	16,506,605	14,238,071
		19,321,785	14,947,573
NET CURRENT ASSETS		10,553,697	7,976,333
TOTAL ASSETS LESS TOTAL LIABILITIES		12,655,649	10,796,660
FINANCED BY:			
Reserve Balance at Beginning of the year		10,796,660	10,609,490
(Deficit)/Surplus for year		1,858,989	(187,170)
Prior Year Adjustments		0	0
		12,655,649	10,796,660

President_____ **Accountant**_____

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

INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED DECEMBER 31, 2012

	NOTES	2012 $	2011 $
INCOME			
Government Grants		37191,260	29714,369
Interest Income		21,203	36,248
Miscellaneous Receipts		1085,223	1299,220
Pension Plan Income		22,000	300,000
		38319,686	31349,837
EXPENDITURE			
Personnel Expenditure	7	5439,377	6366,022
Goods and Services		26866,130	19642,741
Audit Fees		120,000	45,000
Pension & Gratuities		1412,971	1443,670
Health Plan Contributions		180,957	91,241
Board Fees		555,600	611,700
Loss on Disposal		0	5,696
Minor Equipment Purchases		442,054	136,496
Depreciation Charge:			
Equipment and Machinery		400,276	803,122
Furniture and Fittings		74,895	65,585
Motor Vehicles		44,693	80,092
Exhibits		923,744	1871,302
		36460,697	31162,667
Surplus (Deficit) for year		1858,989	187,170

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

STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED DECEMBER 31, 2012

	2012 $	2011 $
OPERATING ACTIVITIES		
(Deficit)/Surplus	1858,989	187,170
Adjustments:		
Disposal of Assets	2	5,695
Depreciation	1443,608	2820,101
Decrease in Deferred income	2268,534	(168,946)
Sub Total	5571,133	2844,020
Decrease in Accrued Expenses	1811,052	(806,476)
Increase in Creditors	294,626	29,951
Sub Total	2105,678	(776,525)
Increase in Vat Receivable	(1784,392)	(1246,917)
Increase in Receivables - Interest	(78)	14,153
Increase in Debtors	(3766,774)	(641,949)
Decrease in Prepayments	(15,259)	14,488
Decrease in Suspense	(9,228)	(70,471)
Sub Total	(5575,731)	(1930,696)
CASH PROVIDED BY OPERATING ACTIVITIES	**2101,080**	**136,799**
INVESTING ACTIVITIES		
Purchase of Fixed Assets	(725,235)	(468,712)
Increase in Fixed Deposit	(14,499)	(35,836)
CASH PROVIDED USED IN INVESTING ACTIVITIES	**(739,734)**	**(504,548)**
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	1361,346	(367,749)
Prior Year Adjustments	0	0
Pension Plan Assets	(22,000)	(300,000)
Cash and Cash Equivalents at the beginning of the year	11,437,648	12,105,397
CASH AND CASH EQUIVALENTS AT END OF YEAR	**12,776,994**	**11,437,648**
CASH AND CASH EQUIVALENTS/ REPRESENTED BY		
Cash at Bank	12,768,994	11,429,648
Cash in Hand	8,000	8,000
	12,776,994	**11,437,648**

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2012

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:

- to promote scientific and technological services in society;
- to promote and develop an indigenous capability in science and technology relevant to the development needs of society;
- to assist national bodies and/or organizations 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 an historical basis.

b. Adoption of new and revised IFRSs and IFRICs

During the current year the Institute adopted new, amended and revised International Reporting Standards (IFRS) and International Financial Reporting Interpretations (IFRICs) which are relevant to its operations and are effective for accounting periods commencing on or before January 1, 2012. 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 rates estimated to write-off the assets over their expected useful lives.

Current rates of depreciation are:

Equipment	-	33⅓
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.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2012

e. Investments

Held-to-Maturity investments are carried amortized cost.

f. Grants Funding

Grants are recognized 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 recognized 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.

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 amount 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 require 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

Revenue is recognised to the extent that it is probable that the economic benefit 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.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2012

l. Impairment of assets

Non-financial assets

The Institute assesses 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 the 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 group or assets. When the carrying amount of an asset exceeds its recoverable amount, the asset 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 of the plan every three (3) 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.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2012

3. FIXED ASSETS SCHEDULE 2012

	Equipment	Furniture & Fittings	Motor Vehicles	Exhibits	TOTAL
COST:	$	$	$	$	$
B/F 2012 At beginning of the year	10,499,238	1,128,214	408,471	12,536,500	24,572,423
Acquisitions 2012	514,371	210,864	0		725,235
Disposals/Adjustments	(14,376)	0	0	0	(14,376)
	10,999,233	1,339,078	408,471	12,536,500	25,283,282
Accumulated Depreciation:					
B/F 2012 At beginning of the year	9,632,665	759,580	361,915	10,997,936	21,752,096
Disposals/Adjustments	(14,374)	0	0	0	(14,374)
2012 Charge	400,276	74,895	44,693	923,744	1,443,608
	10,018,567	834,475	406,608	11,921,680	23,181,330
NET BOOK VALUE AT 2012 DECEMBER 31	980,666	504,603	1,863	614,820	2,101,952
NET BOOK VALUE AT 2011 DECEMBER 31	866,573	368,634	46,556	1,538,564	2,820,327

4. DEFERRED INCOME

		2012 $	2011 $
I)	Cash Donations		
	Balance as at January 1, 2012	14,184,906	14,334,503
	Increases for the year 2012*	9,350,702	6,486,718
	Decreases for the year 2012**	(7,062,819)	(6,636,315)
	Sub-Total	16,472,789	14,184,906
II)	Non Cash Donations		
	Balance as at January 1, 2012	53,165	72,514
	Less Decreases for the year 2012	0	0
	Increases for the year 2012*	0	0
	Less Depreciation for the year 2012	(19,349)	(19,349)
	Sub-Total	33,816	53,165
	Total Deferred Income	16,506,605	14,238,071

* Included in the Increases is Public Sector Investment Programme (PSIP) funding totalling $6,253,000. Funding was provided in the main for the following activities: (a) Sci-TechKnoFest (b) Development of an Innovation System (Young Innovators and Inventors Award) and (c) President's awards for Excellence in Science and Technology.

** Included in the Decreases is Public Sector Investment Programme (PSIP) expenses totalling $5,980,243. Other funds shown in the deferred income account were received from various Organisations to sponsor specific projects. Expenses incurred on these projects are applied directly to the sponsored funds.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2012

5. GOODS AND SERVICES

	2012 $	2011 $
Travelling	646,940	792,893
Uniforms	64,435	50,020
Electricity	542,243	541,162
Telephone	616,191	633,499
Water and Sewerage	22,586	39,430
Rent/Lease-Office Accommodation	4,335,879	3,428,706
Rent/Lease-Vehicles & Equipment	325,712	338,227
Office Stationery and Supplies	423,525	394,348
Books and Periodicals	166,451	90,969
Materials and Supplies	114,634	225,879
Maintenance of Vehicles	153,124	99,134
Repairs and Maintenance-Equipment	189,855	160,980
Contract Employment	7,389,081	6,270,288
Training	216,514	302,653
Official Entertainment	20,808	
Repairs & Maintenance-Buildings	962,310	889,033
Short Term Employment	1,416,876	949,820
Fees	292,757	272,432
Official Overseas Travel	277,565	301,183
Other Contracted Services	658,061	964,741
Janitorial Services	161,198	275,589
Security Services	601,585	683,792
Postage	19,020	7,118
Insurance	223,767	217,118
Promotions, Publicity & Printing	718,405	858,095
Hosting of Conferences & Seminars	6,250,973	1,355,076
Employee Assistant Programme	38,250	37,134
Total Goods and Services	26,848,745	20,179,319

APPENDIX I

2012 SCIENCE WHIZZ COMPETITION WINNERS

Most outstanding students within their categories:

Junior Illustrate - Shakeem Jack, Goodwood High School
Senior Illustrate - Gabriel Patrong, Holy Cross College

Junior Innovate - Netanya Keil, Bishop's Anstey High School POS
Senior Innovate - Elana Harripaul & Amanda Khan, Lakshmi Girls' Hindu College

Junior Investigate - Jiovanna Sebro, Providence Girls' Catholic School

Special prizes:

Junior Illustrate - Elton Moore & Michael Joseph, Holy Cross College
Senior Illustrate - Mackadis Smith, Holy Cross College

Junior Innovate - Dinesh Daniel, Holy Cross College
Senior Innovate - Bob Bissessar & Shane Paponette, Holy Cross College; Trevor Patrong, St. Mary's College

Junior Investigate - Josiah Dempster, Holy Cross College
Senior Investigate - Shalini Misir, El Dorado East Secondary

APPENDIX II

NIHERST SCIENCE MUSIC VIDEO WINNERS (2012)

The winners of the top three prizes of $20,000, $15,000 and $10,000 were:

Acoustic Overdrive - Vincent Lewis, Cleopathra Bernard and Kyeon Constantine

The Global Warming Warning - Moses Mike

Alternative Energy - Lyndon Bacchus, Lincoln Bacchus, Duane Best and Robert Yeates.

Three special prizes also went to:

Sweep – Titan Lee Hai, Aaron Suite, Adam Suite and Zayna Mc Donald

We Have To Save it – Nalini Harripersad, Rachel Gadar, Victoria Young and Swetha Gilda

Ready – Kember Arrindell, Dane John and Warren O'Connell.

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Prime Minister's Awards for Scientific Ingenuity

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