Under the program to cooperate in the field of Science and Technology, an agreement has been signed between India and Sri Lanka to work together in joint research. The agreement was signed at the Ministry of Science, Technology and Research auditorium, under the patronage of Secretary to the Ministry of Science and Technology, Mr. Udaya R. Senevirathne.

An agreement was signed in India in August 2016, between the Sri Lankan Ministry of Science Technology and Research and the Department of Science and Technology in India, to carry out a program to cooperate in the field of Science and Technology. It is the second agreement which had been signed by both parties for the progress of the field of Science and Technology.

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- Dulip Nayanapriya -

A conference was held at Water’s Edge Battaramulla recently on formulating a Government Policy on Science, Technology and Innovation and the need to have the contribution of Scientists, Technologists, and Professionals for their implementation in a systematic manner. The theme of the seminar was ‘Implementing Policies through Action’, a concept proposed by the Minister of Science, Technology and Research, Susil Premajayantha. During the seminar, separate discussions were held on Policy Based Action, the role of the regime, Policy Based Action on Science Technology and Innovation and Policy Based Action on STEM Education.

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’Sahasak Nimawum- 2017’ invention exhibition and competition, organized by the Sri Lanka Inventors Commission of the Ministry of Science Technology and Research, has commenced recently, at the Sri Lanka Exhibition and Convention Centre (SLECC), with the headship of the Secretary to the Ministry of Science Technology and Research, Mr. Udaya R. Senevirathne. The exhibition and the competition which has been organized for the 6th consecutive time by Sri Lanka Inventors Commission. It is divided into four sections: Inter school, Open, Inter University, Tertiary Educational Institutes and commercialized inventions. The inventions, appreciated in the 1st round in the provincial level, have been exhibited in this national competition, and there are 400 inventions from fourteen different fields. The best inventions and the inventors which will be selected from the competition will be offered ‘Dhasis’ awards. Global inventors Intellectual Property Commission has offered a special award to Minister Susil Premajayantha, for his contribution towards encouraging inventors of Sri Lanka.

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Hon. President joins the conference
President presented with many issues relevant to the subject
‘It is time to break the silence of academics’, says the President.

Sri Lanka and India sign agreements to undertake Joint Research

Under the program to cooperate in the field of Science and Technology, an agreement has been signed between India and Sri Lanka to work together in joint research. The agreement was inked at the Ministry of Science, Technology and Research auditorium, under the patronage of Secretary to the Ministry of Science and Technology.

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As Sri Lanka embarks on a rapid towards development at present, the Industrial Technology Institute (ITI) has taken steps to greatly contribute towards the country’s growth. Nobel prize winning novelist Anatole Frank once said, ‘Not only the hard work, but also we need to dream, to achieve our goals, plans are not enough, we need to have faith’, and keeping with that, the Director General of ITI, has proposed the concept of laying the foundation to establish Business Centers, in the country. Our prime goals are to produce goods and services, to generate employment, to eliminate the imbalance in the rural economy and to uplift small and medium scale industries. We have a lot of resources, and by recognizing those resources and skills, we will be able to provide a multipurpose service through the Business Centers. There are many occasions on which entrepreneurs fail to achieve success in their businesses like when introducing new products through value addition to local resources, lack of technological knowledge and inmarketing and they face all these immense challenges on their own. The Business Centre thus will provide them with the knowledge, directing them to respective places to acquire necessary training and assist new entrepreneurs in providing goods and services suitable to the market. We expect to provide all the necessary services from one place (onestop shop) and to introduce demand for new products which can be brought to an international level via the global market providing them with quality assurance, training and to coordinate all other services required for the products. We possess a devoted, skilled, and friendly staff for the purpose and we hope that the new entrepreneurs possess the strength and the dedication to acquire the knowledge and the services from them to win the market, and we will be able to guide them efficiently to make their dreams come true. The Centre will provide services needed to produce innovative technology, adding value to indigenous raw materials, instructions to enhance the quality of their products and to help improve market rapport. The most significant fact among all these multipurpose services, will be the ability to obtain all the necessary information required for the businessmen and the entrepreneurs in one place. We will join hands with government institutes, research institutes and the universities to provide these services. We expect to promote these services via a website, enabling any person who lives in a rural area to acquire knowledge rapidly and conveniently. Through the full utilization all the arms of the government together with the private sectors, the government service will work efficiently to fulfil their needs. Financial assistance needed to establish the Business Centre will be provided by the President’s Secretary’s office, and we are glad to inform that we have been assigned as technical partners in the ‘GramaShakthi’ peoples’ movement.

Manori Wijemanna
Senior Deputy Director
Marketing and Promotional Division

Clinical Trials in extracting

Ceylon Cinnamon to control Diabetes and Cholesterol Successful

It is been reported that, the blood glucose and cholesterol levels of persons have been considerably decreased in the clinical trials (Phase 1) carried out using a cinnamon capsule, for 30 healthy patients during 03 months. Further blood pressure has been retained in appropriate levels. (Lipid parameters considered: HDL, VLDL & TG remained unchanged and significant reduction in TC & LDL levels noted during three months) Apart from these, it has been confirmed from these clinical trials that the Ceylon cinnamon extractor has no adverse side effects on human body. As the second phase of these clinical trials, experiments are scheduled to be carried out using 210 diabetic stricken patients within 4 months. It is expected, after these clinical trials, to adapt a Ceylon cinnamon extractor capsule, for the diabetic stricken patients and for the people with high cholesterol levels.

Clinical research are handled by the group of doctors including Dr. Priyanga Ranainghe, Faculty of Medicine University of Colombo, Specialist Dr. Prasad Katulanda and Priyadarshana Galappaththi.

H.D Weerathunga
Research Scientist
Industrial Technology Institute (ITI)
Minister Susil Premajayantha states that it is necessary to uplift life conditions of the people achieving sustainable development goals. He stated this at the 4th International Conference on Multi Disciplinary Approach (ICMA) 2017, “sustainable development through multi-disciplinary research” which was organized by the Faculty of Graduate Studies of the University of Sri Jayawardenapura, with the co-organizing of the Ministry of Science, Technology and Research and the National Science Foundation. The conference was held recently at the Hikka trans Hotel, Hikkaduwa. The theme of the conference ‘Achieving Sustainable Development through Multi disciplinary Research’

This conference is an annual subjective conference which helps to create space for the Educationists, Researchers and Professionals, to exchange their knowledge, experience and research outcomes, which have been spread over various academic fields.

The purpose of this conference was to create a stage, for the researchers, policy makers and policy holders to discuss about the ongoing and already done research projects in various fields of the seminar was to present suggestions which can be used in government policy making which will help build a stronger economy. The Hon. President also joined the seminar as discussions proceeded. At the seminar, many matters relevant to the subject were presented to the President by the scholars in the field of Science Technology and Innovation, and the President explained his stance on the matter. A large gathering including the Minister of Science Technology and Research, Mr. Susil Premajayantha, Government Ministers Mr. Eran Wickramaratne, Mr. Lakshman Seneviratne, Mr. Mohanal Gineto, Secretary to Ministry Mr. Udhaya R. Seneviratne, Secretary to Ministry of Education Mr. Sunil Hettiarachchi, representatives from private and Government Institutes island wide, scientists from universities and research institutes, technologists, and professionals participated at the event.

The number one goal of them is to alleviate poverty. Accordingly the present government has named this year as the ‘year of poverty alleviation’. We should achieve these goals as a country, amidst challenges. Furthermore we are at a risky situation in food security as well. From one side, it is due to the uncontrollable factor of climatic changes. A half of the country suffers from floods and landslides due to heavy rains, while the other half of the country suffers from severe droughts. Our country has an agriculture based economy. The major percentage of the economy lies on agriculture. But due to current climatic changes, rural economy has been collapsed with the problems of lack of drinking water, loss of the houses and the harvest, and their day to day life has been diminished.

Thus the knowledge and the information which is been negotiated and discussed should be utilized to uplift the life conditions of the people. For that, we will fulfill the responsibility of our ministry, with a clear and effective plan, bringing together Government Institutes, Scientists,

The road taken towards development is widely discussed at present and the role of the government in this process is to take the country to an upper middle income state. In achieving these goals, by adding extra value to our natural resources such as agriculture field and minerals, can elevate the worth of these resources. The field of Science Technology and Research should be utilized productively for this value addition. There are many reconstructions that should be carried out for the development of the technical field. And thus STEM education should be popularized and uplifted for the purpose of creating the next generation who could revolutionize the field of Science Technology and Innovation. The aim of researchers, Inventors, Entrepreneurs and Policy Makers, to lead the country towards a sustainable development overcoming all the challenges.

Research papers have been presented, focused on health science, natural science, physics, Management and Finance, Humanities, Social Sciences, Engineering and technology at the conference which was participated by the local and international universities, research institutes, Ministries, Non Governmental Organizations (NGOs) and famous scientists and researchers representing private sectors, The Vice Chancellor of the University of Sri Jayawardenapura, Prof. Sampath Amarathunge, the Dean of the Faculty of Graduate Studies, Prof. Hemanthi Ranasinghe, the Dean of the Faculty of Applied Science Prof. Sudantha Liyanage, the Director of the Ministry of Science and Technology P.M Dharmatilake along with the local and international researchers and the scholars participated at the event.

Ministry of Science Technology & Research

Susil Premajayantha

Minister of Science Technology & Research

Sri Lanka and India...

According to the agreement on cooperation, proposals have been presented for the joint research projects and workshops on Food Technology, Plant Science, Quantity Surveying, Astronomical Research and inputs, Robotics and Automation, Electronics and other subject areas which are locally important.

After a comprehensive assessment of over 100 proposals received by both countries, an agreement was reached to provide resources to 18 research projects and two seminars at the first Indo Sri Lanka Research Conference, held in Sri Lanka on the 29th May 2017. Prior to implementation of these research projects, a tri party agreement will be signed between the Sri Lankan Ministry of Science and Technology, the chief researcher of the project and the relevant institute.

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Sahasak Nimawum 2017...

A large gathering including, the president of the Indian Inventors Association, Dr.A.S Rao, the Secretary General of the Global Inventors Intellectual Property Commission, H. Man Lee and the Director of youth affairs, Ericha Insan, the commissioner of the Sri Lanka Inventors Commission, Dr. Mahesh Edirisighe and the other scholars and inventors, participated in the event.
Mr. Niroshana Perera
Chairman, Industrial Technology Institute (ITI)

What role does your organization play in the history of Sri Lanka?

Sri Lanka is a country with a rich history. The ITI plays a significant role in modern times, contributing to the development of the scientific and technological community. The ITI provides a platform for researchers to conduct high-quality research and to contribute to the advancement of various fields, including industrial technology, agricultural sciences, and environmental studies.

What are your organization's future plans for expanding its research capabilities?

ITI plans to expand its research capabilities in areas such as renewable energy, biotechnology, and materials science. The institute is also looking to establish partnerships with international research institutions to enhance its research capacity and to promote technology transfer.

What are the most important projects you have undertaken in the past?

The ITI has undertaken several important projects, including research on rice bran oil extraction, the development of probiotic lactic acid bacteria and yeasts, and the investigation of Tragia involucrate to control hyperglycemia. These projects have contributed significantly to the advancement of food science and technology in Sri Lanka.

What have you got to say about the role of your institute in the country’s future?

The ITI plays a crucial role in fostering innovation and promoting economic development. Its research findings have the potential to solve practical problems and improve the quality of life in Sri Lanka.

What about the human and physical resources of the institute?

The ITI has a well-defined governance structure and a dedicated team of professionals. The institute's resources are used efficiently to support research initiatives and to provide services to the public.

What about the facilities of the institute?

The ITI possesses a modern infrastructure that includes equipped laboratories, modern research facilities, and a well-maintained research environment. The institute also provides access to the latest research tools and technologies.

What do you think about the potential for collaboration with other institutes and organizations?

Collaboration with other institutes and organizations is crucial for advancing research and addressing complex problems. The ITI has established partnerships with other research centers and universities to enhance its research capacity and to promote knowledge sharing.

What are your views on the research projects that are currently being funded by the government?

Government funding is essential for supporting research initiatives. The ITI welcomes funding opportunities that align with its research priorities and contribute to the advancement of science and technology.

What are your views on the future of research funding in Sri Lanka?

Relying on government funding is crucial for research institutions. However, it is essential to diversify funding sources to ensure sustainable funding for research initiatives.

What are the implications of the current economic situation on research funding?

The current economic situation poses challenges for research funding. However, the ITI continues to seek alternative sources of funding to support its research initiatives.

What are your views on the role of technology in promoting sustainable development?

Technology plays a crucial role in promoting sustainable development. The ITI is committed to developing innovative solutions that address environmental challenges and contribute to social and economic progress.

What are your views on the impact of new technologies on the education sector?

New technologies have the potential to revolutionize the education sector by providing access to high-quality educational resources and facilitating personalized learning.

What are your views on the importance of research and development for economic growth?

Research and development are crucial for economic growth. The ITI contributes to economic development by fostering innovation and promoting the transfer of technology to industry.

The ITI is in the process of upgrading its facilities and acquiring new research equipment to enhance its research capabilities. The institute is also looking to establish partnerships with other research centers and universities to promote knowledge sharing and to foster innovation.
Rice is the staple food for half of the world’s population including Sri Lanka. Rice cultivation in the country has a very long history and it dates far back as 800 B.C. During this period the country was known as the Granary of the East and existence of nearly 2000 indigenous or traditional rice varieties had been reported. These varieties had high diversity and thus able to adapt into diverse rice growing environments. Some of these varieties were claimed to have diverse nutritional and medicinal properties according to the Sri Lankan traditional knowledge and folklore. Such properties include ability to enhance and improve the immune system, body strength and sexual strength, ability in treating people intoxicated with snake venom, facilitating easy digestion and excretion, ability in treating people having fever, diabetes, constipation, urinary problems, obesity and tuberculosis.

Industrial Technology Institute (ITI) is a pioneer multidisciplinary research institute in the country. The research on traditional rice varieties of Sri Lanka was started at the Food and Herbal Technology Sections of the ITI in early 2006, the time where there was no single comprehensive study conducted in the country on such varieties. The research project was started with the view of developing a data base on traditional rice varieties. The medicinal properties were studied comprehensively and was lead by the Senior Research Fellow Dr. G.A.S. Premakumara (Phd), Director General, ITI. Research activities were carried out by Dr. Kanchana Abyesekera, Research Scientist attached to the Food Technology Section of the ITI. Twenty five traditional rice varieties were studied (in vitro and rat studies) to evaluate its suitability in prevention and dietary management of diabetes, cancer, inflammatory and neurological diseases: the major non communicable diseases (NCDs) worldwide.

Prevention of Diabetes
Diabetes is a chronic disease. Recent varieties were tested for its ability to inhibit protein glycation reaction. Interestingly, red rices showed very high activities compared to white rices and Sudu Heneeti, Goda Heeneti, Masuran and Dik Wee varieties had the highest inhibitory activities. The study was further extended to evaluate the ability of red rice brans to reverse already formed protein glycation end products (known as Advanced Glycation End products: AGEs). Findings showed that selected rice varieties had reversing ability of AGEs: one of the most essential biologic activities in management of diabetes complications. These properties were discovered for the first time for any rice variety worldwide. Thus findings of this research indicate importance of consuming especially Sri Lankan traditional red rices with the bran for prevention and dietary management of diabetes and its deleterious complications. Studies were also conducted in rat models and observed blood glucose lowering properties in such studies.

Solution for Cancer
Cancer is one of the leading causes of morbidity and mortality worldwide. It is reported that one in seven deaths in the world is due to cancer. In Sri Lanka cancer cases are rapidly increasing and the most commonly diagnosed cancers are lip oral cavity and pharynx, trachea bronchus and lung, esophagus, breast, cervix uteri, ovary, thyroid, colon and rectum. In this study effect of brans of Sudu Heeneti, Goda Heeneti, Masuran and Dik Wee varieties were evaluated against human cancer cell lines: lung, cervical, breast, colon and blood. Interestingly studied varieties showed growth inhibition and cytotoxic effects against all the cancer cell lines tested indicating that brans of these varieties may have the potential in managing cancer patients. Effect of selected rice varieties on neural diseases were evaluated against the cholinesterase enzyme inhibitory activities. Brans of red rices showed both acetyl and butrylycholinesterase inhibitory activities indicating that it may have the possibility for using prevention and dietary management of neurological diseases such as Alzheimer’s and Parkinson diseases.

Current scientific classification states that all non communicable diseases are inflammatory diseases as these diseases can be explained through inflammatory pathways. Anti-inflammatory properties of such varieties were studied in human blood and cell assays. Selected varieties had anti-inflammatory activity mediated by multiple mechanisms: reduction of oxidative burst of human blood, and immune cells including polymorphonuclear cells and macrophages, inhibition of nitric oxide and proinflammatory cytokines. TNF (Tumor necrosis factor)-α and IL (Interleukin)-1β without mediating cytotoxicity to normal cells. Consumption of antioxidant rich foods are encouraged as free radicals induced oxidative stress is directly associated with the development and progression of several NCDs such as cancer, diabetes, heart diseases, neurological diseases and inflammatory diseases.

Findings of this study showed that brans of red rice had high antioxidant activities compared to brans of white rices. The antioxidant activities observed in brans of some of the red rices such as Kalu Heeneti, Kurulu Thuda, Pachchaperalum and Ma Wee were far superior to the black rice: the rice varieties reported to have highest antioxidant activities worldwide.

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Solar farms

Figure 1: Si solar panels

Prepared by: C.H. Manoratne

Kg., this may produce a colossal impact on export revenue of Sri Lanka owing to competitive high price estimation per one Kg over their raw forms.

Many applicable uses of silicon especially in solar cells require a very pure product. The Materials Technology Section of Industrial Technology Institute is currently engaging in developing of an efficient and cost effective method to extract high pure Silicon from locally available quarries.

Sila is considered to be the eighth most common element in the universe and the second most abundant element (about 28% by mass) in the Earth’s crust after oxygen. However, it is not found as the pure element in the Earth’s crust, but as constituent of other substances. To name a few examples, sand, quartz, clays, flint, amethyst, opal, mica, feldspar, garnet, tourmaline, asbestos, talc, zinc, emerald, and aquamarine. Silicon has many uses or applications in the present world, perhaps the best known use of silicon is in electronic devices. Ultra-pure silicon is used as semiconductor material in transistors and other components of electronic devices. In the present world it can be seen that Si has obtained remarkable place in making photovoltaic (solar) cells, rectifiers, and parts for computer circuits. A photovoltaic cell is a device that converts sunlight into electrical energy. A rectifier is an electrical device for changing one kind of electric current (alternating current, or AC) into another kind of electric current (direct current, or DC).

Extracting or obtaining of Si element from the above mentioned sources is not easy and it is highly energy intensive and complex process. There are various ways by which Si can be extracted; however, most common and conventional technique is by heating silicon dioxide with carbon (carbothermical reduction). Carbothermical reduction ultimately produces various byproducts during reduction process that further accounted for metallurgical grade silicon, which may include some impurities. However, the photovoltaic (solar grade silicon) and electronic applications required high purity silicon generally identified as 6N or 9N. Quartz is one of the minerals in which Si can be found and present famous materials for Si extraction. Sri Lanka is blessed and famous for the exquisite varieties of very high purity minerals such as 99+ pure and 100% pure quartz. Quartz is chemically SiO₂ (silica) and is considered one of the most abundant minerals found in the Earth’s Crust. Although the major part of silica is produced from silica sand their purity does not meet the highest level that can be obtained in Sri Lanka natural Quartz, see figure 1.

Although such highest pure natural resources are available only in Sri Lanka unfortunate fact is that until recently, the local quarats are exported in their raw forms without any value addition. For example, the highest pure (100% pure) quartz in the form of 3 mm particles are sold at USD 240-250 a ton, whereas low-grade Quartz stones are sold at USD 300-500 per metric ton. But with the value addition to this quartz to produce Solar grade silicon can be sold at a higher price of USD 20-100 per one metric ton.
World Science Day is internationally celebrated to highlight the importance of science for society and the role of science, in peace and development. It is celebrated every 10th November since the year 2001. World Science Day also highlights on emerging scientific issues. The day offers the opportunity to mobilize all stakeholders around the topic of science for peace and development; from government officials to the media, general public and school children.

By linking more closely with society, the World science day aims to ensure that citizens are keep informing of developments in Science and Technology. It also underscores the role of scientists in broadening the understanding of the remarkable, fragile planet which facilitates the social sustainability. In 2015, countries adopted a set of Sustainable Development Goals (SDGs). As a part of the agenda, poverty alleviation, and the reduction of the issues regarding climatic changes, are expected to be carried out and this is a great opportunity to distribute knowledge related to Science and Technology especially among younger generations and the general public, to confederate global sustainability and local activities.

‘National Science Day’, the following week as the ‘Science Week’, concurrently to the National Science day which is dated on the 10th of November.

Objectives
Among the main objectives of publishing a World Science day, and a Science week are to strengthen public awareness on the role of Science & Technology for sustainable societies in relation to Sustainable Development Goals (SDGs), promote national and international solidarity for sharing advances in Science, Technology and Research between different fractions of the society, towards poverty alleviation, renew national and international commitment for the use of science and technology. Create public awareness on Science and Technology interventions and National Development.

A Meaningful Celebration
Accordingly, programs including exhibitions and walks and other programmes to popularize science and technological knowledge on a national level, have been scheduled. The national program which has been scheduled on the 10th and 11th November 2017, is taking place with the coordination of the Ministry of Science Technology and Research and research institutions which are operating under the Ministry.

Short films related to the Science and Technology, video clips, seminars and science exhibitions have been scheduled to be carried out through Science and Technology officers aware school children and the general public, in relation to the field of Science and Technology.

Furthermore, in schools the theoretical and practical knowledge of Science and Technology are expected to be promoted; to recognize and to encourage innovations of the school children, and to propagate the updating knowledge on Science and Technology on school level. District level programs are scheduled to be carried out with a proper coordination among Science and Technology, Schools and other government organizations and NGOs, voluntary organizations and the general public.