Research and Development Complex for Industrial Technology Institute

W.A.S. Nisansala Kumari

The Industrial Research Institute of Sri Lanka (ITI) that was created in the year 1955 as the Ceylon Institute of Scientific and Industrial Research (CISIR) by the Science and Technology Development Act No. 11 of 1994, is providing its continuous service productively giving technical assistance to local industries and helping to enhance production through production processes and upgrade the quality of products. Through this institution, the main research and development institution in Sri Lanka which is armed with a staff of intellectuals consisting of highly qualified and experienced Scientists, Engineers and Technicians is successfully assisting entrepreneurs in technical adaptation and commercialization, and the research and development projects for adding more value to local raw material are being operated. The Institution is successful in operating these research and development programmes through the sections production, processing and industrial planning and obtaining the highest results, and providing a silent but massive assistance to the economy of the country through commercialization. ITI in a long-term mission at the time of celebrating its 60th anniversary has established a Research and Development Complex with laboratory facilities of international level on a land of about 10 Acres in extent in Malambe with the objective of broadening the services of enhancing the research and industrial development of Sri Lanka more than ever with the experiences derived during the past. This Complex is due to be opened by the President Maithripala Sirisena in the near future. Through this Complex entrepreneurs will be able to overcome many challenges in planning their products and manufacturing processes at laboratory level and broadening them to a large scale industrial process.

60 Anniversary (1955-2015)
Successor to CISIR

Staff Appreciation Ceremony under the aegis of President

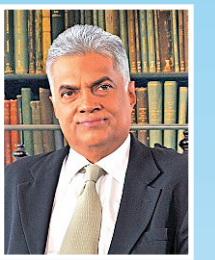
The Industrial Technology Institute (ITI) is practically carrying out its tasks with the objective of enhancing the technical development at a very high level with private sector organizations and working with great dedication towards the industrialists of Sri Lanka and giving a massive contribution to the Sri Lankan economy. To strengthen the path of the ITI equipped with ultramodern technical laboratories and an unmatched human resource, the assistance given by scientists and engineers with superior knowledge and experience in the international sphere is immeasurable. Arrangements are being made to hold a staff appreciation ceremony for staff members that have dedicated their unwavering commitment for a period of over 25 years with the objective of encouraging the scholarly staff by appreciating their services to the institution and the country at the BMICH under the aegis of the President Maithripala Sirisensa, parallel to the 60th anniversary celebrations, with much glamour.

Ministry of Science, Technology and Research

President Maithripala Sirisena

"The objective of our Government is uplifting local industries through strengthening local entrepreneurs. To achieve this, a sustainable industrial policy is essential for the country. The economic growth we are expecting could be achieved by uplifting the value chain of the product sphere from small scale productions to mega scale productions through a sustainable industrial policy. Utilizing modern technology through methodical research and development policies and introducing new methodologies is also essential. Action should be taken to grow and nurture small and medium scale enterprises and they should be facilitated to connect with large scale enterprises.

While valuing the Industrial Technology Institute, that is celebrating their exalted mission of six decades, for their contribution to the promotion of the industrial sphere of our country overcoming new challenges of the new world with the experiences and maturity obtained from their sixty years existence, I hereby convey my felicitations to the Institution and its staff.



Prime Minister Ranil Wickremasinghe

"The augmentation of Sri Lankan owned organizations that employ Sri Lankans and utilize Sri Lankan resources, is vital towards the betterment of socio economic indicators that fulfill the requirements of sustainable development . Sri Lankan owned businesses and organizations must be encouraged and empowered to enter the global market place with confidence, prizing innovation,in marketing products of the highest quality to the world. Since its inception in1995,CISIR has played a pivotal role in providing outstanding know-how and expertise in Research and Development on new products that have enabled Sri Lankan owned organizations to showcase them globally. The CISIR, for over 60 years, has empowered and engaged with the task of developing world class products in sri lanka, using locally sources raw material. As CISIR is due to embark upon a new and exciting journey into the next phase of Research and Development with a state of the art laboratory and cutting edge research facilities, we are certain that it would continue to develop better, more innovative products that would enable Sri Lankan organizations to present such products on the world stage with confidence and success. I take this opportunity to wish CISIR continuing success with their trail blazing research that undoubtedly is a feather in the cap of SRI Lanka.

May they grow from strength to strength

Vidya
The Official Newspaper of the Ministry of Science, Technology and Research

Our technology and knowledge extremely high

Chairman Niroshana Perera

● What have you got to say about the Industrial Technology Institute (ITI)?

The Industrial Technology Institute is the foremost research and development institution in Sri Lanka. Our laboratory facilities are of the highest quality, while our staff includes some of the most experienced scientists and technicians who hold both national and international qualifications. Our major laboratories have been accredited by relevant world authorities such as ISO and SWEDAC.
Our Institute operates under two main divisions: Research and Development, and Technical Services.
The Research and Development Division invents new products, then processes, develops, and introduces them to entrepreneurs; this helps to uplift the country's economy. Simultaneously, an enormous amount of research is ongoing at the ITI to add value to the natural resources of the country, to ensure food security and safety, and to enhance the nutritional value of food which is what Sri Lanka needs at present. In addition, we also provide the training and applications needed by Small and Medium Scale Entrepreneurs.
The Technical Services Division handles the task of testing and analysis. Our laboratories issue recognized certifications and test reports needed by industrialists and exporters when manufacturing or supplying goods for local or overseas markets. When health and safety issues arose in our country, such as when milk powder was contaminated with DCD, arsenic was found in water and the measuring of noise and vibration on the expressways was carried out, ITI provided the necessary knowledge and testing. Using ultra-modern laboratory equipment such as LC-MSMS we are capable of finding solutions and providing accurate and independent reports. Furthermore, we also operate as Sri Lanka's largest Science and Technology Information Services Center providing accurate, timely information for all, including industrialists, scientists and students.

● Isn't modern equipment necessary for testing and analysis services?

Yes, it certainly is. With the launch of the LC-MSMS last year, ITI can now analyse carbonic & chemicals residue. Hence, we have begun analysing food toxins, additives, and pesticide residue in food. We expect to begin analysing antibiotic residue and pharmaceuticals in the near future. Arrangements have also been made to purchase ICP-MS equipment to analyse metals. This equipment has the capability of analysing healthy metals as well as the heavy metals that are injurious to health. This equipment is so sensitive that even trace residue can be uncovered and confirmed.

● How important is the Research and Development Complex at Malabe?

Concurrent to our 60th anniversary we expect to establish the Food Technology Section and the Herbal Technology Section at this Complex. A modern pilot plant has been established at Malabe to test the technology developed in laboratories at factory level. Problems arising during large-scale manufacturing can be solved through this 'machine shop'. This feature can be used to give a prior understanding of the practicality of the enterprise and of the machinery and equipment required by up-and-coming entrepreneurs before they start their enterprises.
The platform to develop small scale manufacturing processes (pilot plant) can also be utilised for the post-harvest technology of vegetables, fruit, grains, and fish, as well as facilitate the assessment of the shelf life of processed food.

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W.A.S. Nisansala Kumari
Photo – Lalith C. Gamage

Analytical Ability is at ITI to the maximum

Director General - G.A.S. Premakumara

● What led to the launching of the Industrial Technology Institute (ITI)?
This institution was launched on 12th April 1955 under the Colombo Plan by the name of the Ceylon Institute of Scientific and Industrial Research (CISIR) as a research institute for the industrial development of the country under a Special Act of Parliament. The CISIR becomes the Industrial Technology Institute according to the Science and Technology Act of 1994.
The mandate of the ITI is conducting research and development to uplift the industrial sector of the country. What is hoped for in those days, which is creating industries by conducting various research projects and manufacturing various products and providing those products to the entrepreneurs and conducting research and development to uplift the industries that existed in those days was carried out. Especially global level research was conducted in those days pertaining to Essential Oils. Even the necessary equipment and the relevant technology for the extraction of Essential Oils that is ongoing at present have been provided by this institution. At that time, the Government of the day established the Industrial Development Board parallel to this institution. Through this the technology was taken to the industrialists. Those tasks were conducted under sections natural resources, food technology, industries, micro biology, and Electro Physics. At the inception, a pilot plant collection and an Engineering Section had been established. In that era, many highly qualified and brilliant people leaving the universities had made desperate attempts to join our Institution as it has conducted several special research projects even at that time. The analytical report of Cinnamon Oil had been produced for the first time by our Institution. Furthermore, at the inception, a large number of research projects relating to medicinal herbal extracts, spices, food technology and mineral oil were conducted by our Institution.

● Can you give us a simple description of the present institutional mandate to our readers?
The ITI is the foremost Government institution for research and development activities. With the later diversification of the institution into many sectors, at present a large number of research and development projects are ongoing in many sectors. In this Institution there are two main divisions – one division dedicated to research and development and the other division for analytical work. At present, there are five research sections and three analytical sections under these main divisions.
The Food Technology Section, the Herbal Technology Section, the Materials Technology Section, the Environmental Technology Section and the Biotechnology Unit are operating under the Research and Development Division.

● What is the methodology of providing these services?
We have a Sales and Promotional Section for providing these services. We also have a Quality Control Section to conduct the technical and analytical matters at very high standards. Arrangements have been made to obtain internationally accepted standards to protect the quality of the research and development and analysis we conduct. Our industrialists have to face many problems if we do not have this analytical ability of international level. ITI has been internationally recognized as the main institution in Sri Lanka that has reached the level of issuing certifications of international level. In this process of providing technology, we have established a separate section to preserve its quality. We have made arrangements to provide these technologies to the people through the Sales and Promotion Section.

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Going Forward in Modern World with Science and Technology

Technical Services Section

Science and technology perform a massive mission in the modern world to take a country forward and maintain the living standards of its people at a higher level. The institutions in the spheres of science and technology actively support that journey by supplying research and testing services.

Research

Research helps in finding and developing various new inventions, that is, goods and services production processes etc. Testing is used to find out whether the quality of the goods is conforming to the rules and regulations of the country of origin and whether they can cause any ill effect to the consumer or the environment. Especially in the goods have been manufactures for export, it has to be proved by acceptable testing reports that they have been manufactured according to the rules and regulation of the country of export.

Till recent times, in international trade, the exporter as well as the exporter conducted the same research at two places to investigate the quality of the same product. The problem of conducting research this way is that if in an instance where the quality of the product is found to be inferior by the importer, it has to be returned to the country of origin. This is a very problematic situation.

Accreditation Reports

The rules and regulations of a country are only valid inside that country. So, internationally accepted testing reports are very important in exports and imports. The Single Point Testing Concept was introduced here.

The concepts of accreditation of laboratories and independent third party laboratories were introduced accordingly. The Accreditation Certificates are given not only for the process carried out in the laboratory but a certificate issued after also inspecting the various facets such as the technical ability and the ability of the personnel certifying that a particular test has been conducted independently and accurately in that laboratory. Separate Accreditation Reports should be obtained for various parameters done in a laboratory. For example, in order to obtain the Accreditation Certificate to test the vitamins in a particular food item, the laboratory should have several Accreditation Certificates, one for each vitamin.

Accordingly, the largest laboratory complex with Accreditation Certificates belongs to the Technical Service Section of the Industrial Technology Institute (ITI). Furthermore, the Industrial Technology Institute is the first science and technology institution in Sri Lanka to be awarded an Accreditation Certificate.

Historic Record

The Industrial Technology Institute established this record after receiving an Accreditation Certificate from the Accreditation Institute of Sweden in the year 2002. The Technical Services Section of the ITI has also obtained the ISO 17025 Laboratory Quality Management Certificate. These certificates are updated annually. Laboratory audits are annually at international and local level to facilitate upgrading. Accordingly, the Technical Services Section is an internationally recognized third party independent laboratory.

Chemical and Microbiology Laboratory

This is the largest laboratory of belonging to the ITI. Here, many things such as water, food items, agro-chemicals, drugs and medicines, beauty culture preparations, waste water and air quality is subjected to chemical and microbiological tests at this laboratory.

Through the very recently established Residual Analysis Unit has the facility of conducting laboratory tests to identify even miniscule quantities of unwanted compounds and waste matter in a food item, beauty culture preparation or medicinal preparation.

Materials Laboratory

At the Materials Laboratory of the ITI, many tests are conducted to determine the quality of a large number of products such as rubber, plastics, paper, glass, paints and building materials. For an example, before issuing a brand of cement to the market, the required tests are carried out to determine whether it is in a condition to fulfill the conditions of the consumers.

In the same way, the relevant tests are done and the relevant reports are issued to decide the suitability of a particular variety of paper is suitable for the printing of the currency notes of a country.

Electronic Technical Laboratory

The Electronic Technical Laboratory of the ITI has confirmed its expertise through various sections such as the ETL Electronic Science and Acoustic Engineering. This section studies the vibrations and sound intensity of factories and large scale constructions such as Expressways and Metal Crushers. This section also has the ability to predict the noise pollution etc. of a particular construction beforehand and solve those issues. The Weather Station equipment that is used by the National Building Research Organization (NBRO) has also been introduced by the ITI.

ITI provided the solutions to minimize the disturbances to the people's lives from the noise and vibrations when the Southern and Katunayake Expressways were being constructed.

A.S. Pannila
Additional Director General
Technical Services

One of the national level services carried out by this section is the pinpointing and creation of noise barriers to minimize the noise pollution when the vehicles are passing through residential areas.

The ability of the Electronic Technical Laboratory to reduce the engine noise of ships and passenger boats and minimize vibrations through ETL technology has been internationally recognized.

Industrial Metrology Laboratory

Accurate weights and measures are an essential part in the local and international trade and medical test reports.

The Industrial Metrology Laboratory (IML) is an arm of the ITI that provides calibration and measurement services to a large number of industries and test laboratories in the spheres of thermometry, mass, electrical, pressure, dimension, volumetric and force. These services all conform to international standards, and the level of technical excellence provided by the laboratory is reflected in the accreditation the laboratory received from the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) in September, 2004 for mass and thermometry and subsequently in the areas of electrical, dimension and volumetric in August 2007 as per ISO/IEC 17025 standard. Sri Lanka Accreditation Board (SLAB) also granted accreditation in April 2012 for Volumetric and Pressure areas.

To keep pace with the increasing demand for calibration by industry, ITI has upgraded the metrology capabilities with the assistance of UNIDO Integrated Industrial Development Support Program. The sophisticated calibration support Sri Lankan entrepreneurs and exporters need to engage in more technologically intensive activities that demand measurements and tests conducted with precision and accuracy to provide better life for the nation is provided by the IML. This section has given its services voluntarily in various problematic situations that have arisen in Sri Lanka.

Quality Assurance Department

As a properly organized quality control system is essential for an institute to issue test reports recognized at international level, a quality control section has been established at the ITI. The Quality Assurance Department (QAD) of the ITI has been responsible for ensuring that the high standards of the institute are upheld in all its products and services.QAD maintains contact with the external assessment bodies for Conformity Assessment (SWEDAC, SLAB & SLSI) to secure and maintain their respective accreditations/certifications for ITI laboratories/sections.QAD assures that the performance of the QMS is maintained through regular technical audits, training programmes, external quality assurance schemes, reviews, etc.

QAD conducts monthly internal audits on ISO/IEC 17025:2005 to ensure the testing laboratories of ITI are complying to the standard requirements and national regulatory requirements as well. Internal and external quality control activities are being planned on laboratory's requests. ISO 9001:2008 certified sections are also being monitored on quality management systems through monthly audit cycles. Annual management reviews on both systems are being held to review the continual improvement and the effectiveness of the quality management systems of the accredited laboratories, R&D sections and the ISC. ITI have an auditor pool to serve in monthly internal audits the members of which have been trained on auditing and both standard requirements by QAD.

Our Inventions Lead to New Technology

Filter made from red clay to remove fluorides, cadmium and arsenic

The Chronic Kidney Disease is spreading very fast in the North Central Province and some parts of the Southern Province. The suspected cause of this disease of unknown etiology is the high concentrations of fluorides and heavy metals and hardness of the water. The percentage of fluorides in the water of the North Central Province is very high. This condition of large amounts of fluorides has caused a large number of problems.

The Industrial Technology Institute (ITI) has invented a filter capable of removing arsenic, fluorides and cadmium made out of red clay. This filter made with less cost has been recognized as a fine solution to this problem. About 1000 filters have been issued up to the present and their action is being monitored.

Eggs with Omega 3 Fatty Acids

Omega 3 consists of healthy poly-unsaturated fatty acids. They can only be found in food from the meat of animals. Eggs have a small amount of Omega 3. The Scientists at the ITI has been able to get eggs of a higher nutritional value from hens fed with a special new feed made with parts of fish that has been thrown away up to now. When the new feed made according to the research is fed to the hens, the eggs they lay contained a high amount of Omega 3 Fatty Acids. Research has confirmed that that amount if five times the amount of fatty acids found in a normal egg. Omega 3 fatty acids reduce 'bad' cholesterol in the body, regulate brain action and reduce the risk of heart disease, promote eyesight and the growth of nerve cells and reduces premature aging. Eggs containing Omega 3 is presently available in the market.

Brand Name of Sri Lanka Cinnamon

The scientists of the ITI contributed their services to the sphere of the cinnamon industry by confirming the name Sri Lanka Cinnamon has achieved in the global market. The differences between cassia and cinnamon were confirmed by using DNA gene classification and Bar Coding. Cassia contains a compound called Coumarin, which is bad for the health. Scientists from ITI helped Sri Lanka Cinnamon occupy a premium position in the global market by demonstrating these genetic differences.

Bacillus thurenginesis to control Dengue mosquito menace

Bacillus thurenginesis israelensis is a *Bacillus thurengines* species that is endemic to Sri Lanka. It has been reported that mosquitoes could be controlled using this bacterium. The scientists of the ITI isolated this bacterium and after confirming its action, bred it under laboratory conditions and started its production. After studying the optimum conditions for the production of *Bacillus thurenginesis*, it was produced in the form of a liquid, a wet powder, crystals or sticks capable of destroying mosquito larvae and promoted. The production of the *Bacillus thurenginesis* was entrusted to Bio Power Lanka (Pvt) Limited. A pesticide for fruit and vegetables also been manufactured from another species of bacteria, *Bacillus thurenginesis kastaki*.

Improved technology to produce bristle fiber

More than 80% of the fibers manufactured in the coconut fiber industry has been exported for over more than 100 years. These environment-friendly fibers are used in a large number of applications. The quality of the fibers varies according to the methods used in the extraction of fibers. Out of these methods, the Sri Lankan drum technology produces fiber of the best quality. But, the operator has to hand feed coconut husks to the rollers fitted with needles in the machine. This is a very risky operation and the operators are in constant danger of losing their fingers.

An Engineer of the ITI has invented a risk-free coconut fiber extraction machine that automatically draws in coconut husks to the needle rollers. The fibers derived by this machine are longer than those extracted by the traditional machine. This new machine can be operated by untrained operators and the electricity consumed is also low. These machines are currently being used by the Coconut Development Board and are in great demand.

This innovative technology has won Gold Medals both locally and internationally.

KASPER for uplifting the Kithul industry

The Kithul industry with a history of over 200 years is an industry with a great demand. Kithul treacle and jaggery were used extensively as sweeteners before the advent of sugar. Kithul products are in high demand. When sufficient Kithul sap could not be found to satisfy the demand, various chemicals were used, leading to the downfall of the industry. The scientists at ITI studied the traditional Kithul industry and invented a solution named KASPER(Kithul Activation Sap Products Enhancing Reagent) to increase the manufacture of Kithul sap. This solution is capable of increasing the Kithul sap yield by 80 – 100%. This invention is a great help in enhancing the Kithul industry.

Automated Rain Gauges

Landslides occurring with heavy rainfall are a problem face by Sri Lanka. Heavy rain falling in a short period of time is one of the main reasons for these landslides. Steps can be taken to mitigate this disaster by observing the rainfall in landslide-prone areas. As a solution to this, the scientists of the ITI have invented automated rain gauges able to gauge the rainfall during a short period. The data generated from these automated rainfall gauges are distributed directly among the officials through the web network. Through those data they can make any quick decision. This automated rainfall gauge had been fully evaluated and set up in areas such as Mathale, Nuwaraeliya and Kegalle that had come to the attention of the NBRO.

Isotonic Drink

The ITI has manufactured an isotonic drink suitable for sportsmen using lime juice. Manufacturing and marketing rights of this drink have been transferred to Gower Street Holdings Private Limited. It has been introduced to the under the brand name SL Sports Light Blast under technology transfer. This is an ideal drink to restore the energy.

Kothala Himbutu Biscuits

Kothala Himbutu, a plant endemic to Sri Lanka, is used in Ayurvedic medicine to treat diabetes. The Scientists of the ITI invented the technology of manufacturing diabetes control biscuits using Kothala Himbutu and gave that technology to Ceylon Biscuits Limited. this product has been issued to the market at present.

Fruit Packing from Banana Fiber

A packing has been invented from fibers extracted from hitherto disposed banana trees that can be used in the transport of mangoes. This environmentally friendly fruit packing can be used in transporting mangoes instead of non-bio degradable Styrofoam packing now in use.

Bottled King Coconut

King coconut is a very popular drink among Sri Lankans as well as foreigners. Scientist it the ITI was able to bottle king coconut water and prepare it as a drink suitable for export. By using king coconuts six months or more in age, this drink can be kept at room temperature for one year. this technology has been given to a local private company.

Herbal Products

The ITI has developed many personal hygiene products using herbal extracts and given that technology to industrialists. Some of these herbal products are herbal soap, creams, liquid face wash, body wash, skin products such as moisturizers, hair styling products, shampoos, jel, cream, herbal oil, perfumes, tooth paste and mouth wash. Furthermore, mosquito coils and sprays have been manufactured using a herbal extract.

Rice Flour Products

The scientists of the ITI have developed many food items using local rice and rice flour. Among these food items, instant hoppers, dosai and gruel mixtures, bakery products such as bread, biscuits, buns and cake, pasta, noodles, instant foods such as Granola Bars, rice toffee and Rice Flakes take pride of place.

Training Programmes to be conducted by the ITI in 2016

If you are interested in these programmes, all details could be obtained the following telephone numbers of the Information Services Section of our Institution.

011 – 2379800 – 391 – Isanka / 011 - 237817 – 385 Inoka

January

- Tissue culture and laboratory management
  Dr. R.M. Dharmadasa and
  Dr. P. Ranasinghe

February / March

- Identifying CG, GC – MS and HPLC equipment
  Dr. Selvalakshmi Velvendran
- Seminar on Food Security
  Dr. Ilmi Hewajulige
- Training of Boiler Operators
  Mr. Thilak
- Instrumentation Training XRD, FTIR, SEM, UVVis, Particle Size Analyzer – Materials Technology Section
- Manufacturing herbal medicine and perfume by value added technical methodologies
  Dr. Chandima Wijayasiriwardena
- Identifying medicinal herb raw material
  Dr. Chandima Wijayasiriwardena
- Growing herbs in home gardens
  Dr. R.M. Dharmadasa
- Chemical-free environmentally friendly pest control
  Dr. R.M. Dharmadasa

June

Advanced material and Nanotechnology
Materials Technology Section

August

- Safety of Chemical and Microbiological Laboratories
  Dr. Kalpa Samarakoon
- Waste water management and treatment methods
  Ms. Ramya
- Certificate Course on Food Technology
  Dr. Kanchana Abeysekera

September

- Spice Oil Distillation and Quality Control
  Dr. Selvalakshmi Velvendran
- Biological and chemical Research Data Analysis
  Dr. P. Ranasinghe

October

- Business planning for Small and Medium Scale Entrepreneurs Material Technology Section
- Management of chemicals
  Ms. Ranpatige

December

- Practical Workshop on thesis writing Materials Technology Section Training Programmes proposed to be held in the future Certificate Courses
- Higher Certificate Course on microbiological and biotechnology research
  (Duration one month)
- Middle Certificate Course on microbiological and biotechnology research
  (Duration two weeks)
- Basic Certificate Course on micro biological and biotechnology research
  (Duration one week)
  (Organized by Biotechnical Section)
- Quality control technical methodologies to be followed in the manufacture of herbal medicine and perfumes
  Dr. Menuka Eppawala

International Participation Programmes

- Workshop to investigate the bioactive qualities of medicinal plants, sea algae, traditional medicine and active foods
  Dr. P. Ranasinghe
  Dr. Kanchana Abeysekera
  Dr. Kalpa Samarakoon

Vidya
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Research and Development Division and Major Projects

The Research and Development Division of the Industrial Technology Institute (ITI) that is carrying out a pioneering mission in the scientific research and development sphere of Sri Lanka was awarded the ISO 9001:2008 Quality Certification in the year 2009. This is the first such research and development institution in Sri Lanka to be awarded this Quality Certification. At present, the Additional Director General Dr.Radhika Samarasekera is giving leadership to the Sri Lankan mission of the Research and Development Division.

The Research and Development Division of the ITI consists of five main sections:

- Food Technology Section (FTS)
- Herbal Technology Section (HTS)
- Materials Technology Section (MTS)
- Environment Technology Section (ETS)
- Biotechnology Unit (BTU)

This institution conducts these research activities and provides scientific new inventions and technology to the country with the foremost State corporate responsibility objective of further enhancing the economic development of the country and providing more internationally competitive technology to the country.
The Research and Development Division also carries out research and projects to fast-track the technical development of Sri Lankan industries, working in cooperation with Government Departments, Corporations, Universities, and private sector organizations and other entities and prevention and observation of environmental pollution.

Technical Projects

Furthermore, this Division is handles technology transfer, supplying consultancy services, carrying out Contract Projects, supplying Customized Test Services, and holding training programmes in parallel to the experiences of the Industrial Technology Institute. The Research and Development Division operates various researches and development projects under three categories.

Projects carried out with international cooperation

- The project of enhancing the preservation of fruit funded by IDRC of the Canadian Government

- The project of maintaining health protection of humans and food and nutrition protection through Prebiotics and Probiotics obtained from cereals and fruit under the Indo-Sri Lanka Accord
- The research on Sri Lankan sea algae conducted in collaboration with The Korea Institute of Ocean Science and Technology

Furthermore, under the International Cooperation Programme, the Industrial Technology Institute has made arrangements to construct a research laboratory complex and a technology exchange centre.

Projects carried out conjointly with the Government and funding agencies

- The project of inventing a bio-insecticide with the Bacillus thuringiensis Bacteria endemic to Sri Lanka to control insects harming paddy and vegetable cultivations under the funding of the National Science Foundation (NSF) of Sri Lanka.

- A project to attempt to control Gastritis using the medicinal herb Dummalla (Trichosanthus cucumerina Linn) is being carried by the Herbal Technology Section with the funding from the National Research Council of Sri Lanka

- The Fruit Fly is one cause of Sri Lanka's fruits going to waste. It also creates problems in the export of fruits. In this research project, using the insecticide manufactured with Para-Pheromones of the Ocimum tenuiflorum (Maduruthala) plant to control the Fruit Fly was researched. This Pheromone very successfully controls the Fruit Fly. This technology is to be produced for exchange in the near future.

Self-examination for Dengue Fever

- At present, the most series disease affecting Sri Lankans is Dengue Fever. The best way to control Dengue Fever is the control of the vector. In this research project, control of the vectors of various diseases, invention of a set of diagnosis kit to diagnose Dengue Fever and the ability of manufacturing treated mosquito nets is measured.
With the use of this Dengue diagnosis kit, a specialized invention, a person can test whether he or she has contracted Dengue Fever at home without going to a hospital at very low cost using a body fluid such as blood, urine and saliva.

- At present the Sri Lankan Graphite is sold for very low prices. The largest market in the world is for value-added Graphite. The Materials Technology Section is manufacturing 99.99% pure Graphite using Graphite purification methodology. This project is operated under the funding from the National Science Foundation.

Dr. Radhika Samarasekara
Additional Director General
Reserch and Development

'Vidya" Newspaper Issue

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We, as human, have already been succumbed to globalization as a result of limitless competition in the quest for acquiring new knowledge, which comes through carrying out experimentations to test hypothesis, noting observations and making conclusions – adhering to the fundamental principle of scientific research. As Sri Lankans, we were not far behind in that competition to support research and development by inaugurating an Institute dedicated for the development of Science and Technology in the year 1955, which has become the present-day Industrial Technology Institute that has won worldwide acclaim of its 60 years of existence with steady progress.

We, going forward on that path, have already reached the foremost position among local research institutions. Furthermore, we have strengthened our ties with the European Economic Community, the United Nations Development programme and other international research organizations to embrace standardized approaches towards establishing uniformity in products and services catering tolocal and export business.

To achieve these goals, our institution is equipped with the world recognized state-of-the-art laboratories that are staffed with well-experienced and talented members. The Chemical and Microbiological Laboratory, Material Laboratory, Industrial Metrology Laboratory Electro Technology Laboratory are some of the main laboratories of our institution. This laboratory,along with the institute's Quality Assurance Department conducts its research and testing under the accreditation of ISO 17025 and ISO 9001:2008 to produce quality certifications according to the accepted guidelines.The foremost task of our institution is to provide test reports required for all industries that intend to introduce new technologies and products.

Efforts from our institute to expand and introduce a bacterium to potentially eliminate the mosquito that harbors the Dengue virus, a fatal and persistent endemic in Sri Lanka is a prime example that led to the savings of foreign exchange to the country. Another key invention is the development of a domestic water filtering apparatus to remove heavy metals and other toxic constituents from drinking water that have been shown to cause the ChronicKidney Disease, which israpidly spreading in the North Central Province. Research efforts are also currently underway to find approaches to potentially eradicate the Chronic Kidney Disease form the SriLankan society.

Standardization testing

The institution also provides a battery of tests to analyze imported foods, cosmetics, agro chemicalfertilizers and pesticides to ensure their consistency with respect to international standards along with their compositions to regulate the approval of their use and consumption to Sri Lankancitizens. Using novel technologies, the Chemical and Microbiological Sections at ITI perform analytical research on technical sectors such as nano technology, food, gene and tissue culture technologies. The institution also provides services at the level of supervision and planning of operations at the Colombo Dockyard Limited, multiple expressways and all other large-scaleroad development projects.

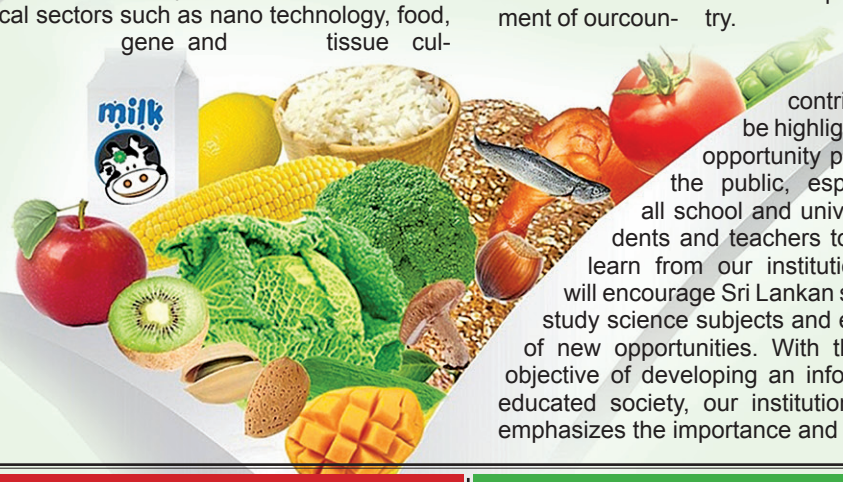
In addition to its engagement in cutting edge research, the institution also conducts local and international training programmes,advisory and consulting services to many areas of Science and Technologies. During the past six decades, the IndustrialTechnology Institute was able to provide services to local Small and Medium Scale Enterprises, which enabled uplifting of the quality of local products and their manufacturing processes. Our institution is also having strong ties with, not only the local Medium and Mega Scale Entrepreneurs but also with rural Small Scale Entrepreneurs. Another focus of our institution has been the research and development efforts to add value to local raw materials. Through these efforts, especially in the areas of product and process development as well as their commercialization, a large number of entrepreneurs have been generated across the country.

Impact to Sri Lankan society

The institution has a staff of intellects to successfully assist Large, Medium and Small Scale Entrepreneurs in technical adaptation and commercialization.

The Industrial Technology Institute is in good cooperation with all the communities of Sri Lanka. The propagation of any new technology invented and developed by ourinstitution to the village level is done through the "Vidhatha" centers established in almost all Divisional Secretaries' Divisions island-wide.

It is no secret that Small and Medium Scale Enterprises make a considerable contribution to the economic development of ourcoun- try.



Another contribution to be highlighted is the opportunity provided to the public, especially to all school and university students and teachers to visit and learn from our institution, which will encourage Sri Lankan studentsto study science subjects and edify them of new opportunities. With the overall objective of developing an informed and educated society, our institution strongly emphasizes the importance and signifi cance of their transformation into better health, nutritious food habits.

Utilizing Local Resources

Most enterprises dedicate a significant contribution to manufacture goods and services utilizing local human resources as employees as well as local raw materials. The services offered towards boosting of the country's economy during the past six decades by our institution through offering the required expertise and know-how to exporters to escalate their products to the international level through research and development is significant and should not be unnoticed. A large number of new technological methodologies have been introduced to the country to strengthen the quality of products from the local agriculturists to minimize about 40% loss experienced during storing and transporting of fresh vegetables and fruits.

It is also further emphasized the positive impact made from our research to reduce or eliminate harmful environmental factors contributing to certain adverse effects on people as well as on food that they consume routinely.

Along with the celebration of the 60th anniversary of our esteemed institute, we are fortunate to vest the newly built Research and Development Complex at Malabe, which will be extremely important towards the enhancement of Science and Technology in our country.

In this new Malabe facility, entrepreneurs will get the opportunity for testing the viability and potential challenges associated with manufacturing processes of their products. In addition, at this new complex, entrepreneurs will have the opportunity to obtain expert opinions as well as solutions to their challenges by our talented and experienced staff to transition specific processes from a small-scale proof-of-concept stage to large-scale manufacturing platforms to achieve sustainable industries. If required, an opportunity also exists for industrialists to obtain required training for their staff at their work places through our panel of experts.

Manori Wijemanne
Senior Deputy Director
Marketing and Business Development
011 2379808

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Our technology…

▪ What is the contribution of your institution towards the country's development?

We are providing a massive contribution towards potentially resolving a plethora of economic and social issues of the country. We are enhancing our products based on local raw materials to introduce them to global markets through new inventions. For these efforts investments have been committed from manufacturers with products focused for the export markets. We have also not only issued clearence on basic requirements for establishing factories evaluating disposal of waste water without harming the environment but also provided an advisory role on their construction.

We are providing a massive contribution to the progress of the country withseveral objectives of making science and technology contribute to it in our 60th year.

We are ready for that. By the year 2025, if we could add value to almost every item exported-from Sri Lanka that will be a great achievement for us. Furthermore, in the future,

We might be able to produce solutions to alleviate deadly diseases. We have importedStevia rebaudiana, a plant, which is 300% sweeter than sugar and native to Paraguay. We have already completed its cultivation and identified ideal conditions for its proper growth. If we can use this, which is already being used in Japan, Australia and China with our tea as a sweetener, it will be of great benefit to Sri Lankans as it is a valuable alternative to Sugar that helps maintain healthy blood glucose levels. Furthermore, we are expecting to produce a potential anti-cancer agent.

Continued from Page 02

Analytical ability…

We are conducting education and training programmes to achieve this objective. Furthermore, we are taking our technical methodologies to the rural level through the 'Vidatha' Programme. Responding to the requests at provincial level, we provide the required technology by getting the people that has to be trained to our institution or by going to the institution that has made the request and conducting workshops. We new inventors are directed to us we also give them the required assistance. We have provided the maximum opportunity for the analytical and research projects of university students and school children. We conduct about 10 – 15 workshops per year. Our institution is having the largest technical library in Sri Lanka. The library is open to anybody requiring technical knowledge including industrialists.

We also provide the opportunity for the researches of university students and Post – Graduate students. The specialty of our research projects is that they are not just confined to a Research Paper. There is an end result. Even if the student finishes his or her Research Paper and leaves, we take the research project forward. If the research project pertaining to Kithul is taken for example, the research was only done on its ingredients and the medicinal value. Only these two people have done a research on Kithul. Furthermore, traditional rice is going to be cultivated on 15,000 Acres as a result of research conducted by us. Even though we have not been vested with and authoritative power, the consumer is being protected through the introduction of these products with medicinal value. When the DCD problem arose with milk powder the same thing happened. This is an institution with ability to research at the highest level.

Several sections performing Numerous Tasks

Engineering Services Section

The Engineering Services Section of the Industrial Technology Institute (ITI) comprises of an efficient, talented and professionally trained staff. The mainrole of the Engineering Services Section is to fulfillall maintenance requirements of various sections across the institute, including those of all laboratories. In addition to its routine role, this section also supports necessary technical services to all new inventions conceived and brought to practice by ITI staff.

New Inventions

To bring new inventions of the ITI to life, this section has pioneered the design and manufacture of new machineries, including those to automate processes involved in several Small and Medium Scale Enterprises. Of note are the machines designed for essential oil extraction, raw material mixing, manufacture of medicinal balms, removal of the seed from the Rambutan fruit and the husk from the Durian fruit.
Furthermore, the machine designed and manufactured for the extraction of longest bristle fiber from coconut husk has won international acclaim. This is an invention of the Sectional Head.

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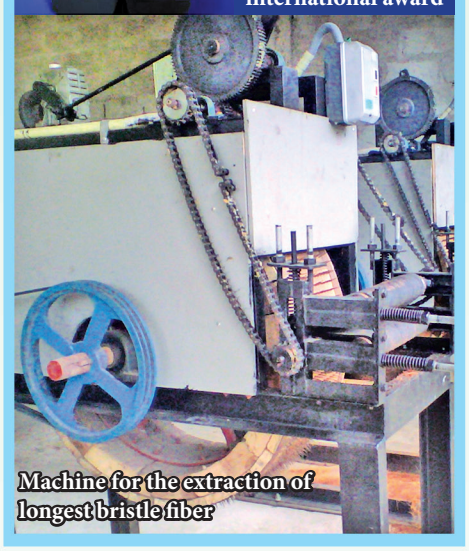
Anura Hettiarachchi being awarded the international award



Machine for the extraction of longest bristle fiber

Herbal Technology Section

Essential oils

Staffed by a research team consisting of eight scientists at the Doctorate level and supported by a well-trained, talented and efficient staff, The Herbal Technology Section takes a premier position in the Research and Development (R&D) sector of the ITI. This Section provides invaluable research and development services to the herbal extract, aromatic oil and perfume industries. This section claims successful completion of 22 research projects in the year 2015 alone.
In addition, this section has provided consumer services to approximately 350 research projects relevant to various industries, including Sri Lanka's famous beauty culture industry focused on various herbal extracts that promote skin brightness, anti-aging and skin moisturizing derived from Cinnamon, Murunga and Aloe Vera. Furthermore, over the years,the Herbal Technology Section has helped entrepreneurs to develop and manufacture herbal-based shampoos, tooth pastes, lotions, soaps and perfumes. This Section also bear responsibilities such as benchmarking of species and the quality of Ceylon Cinnamon and other spices, providing Quality Control Reports for capsules, tablets, syrups and other medications containing herbal extracts. A methodology has been developed to identify Wallapatta and its resins using GC/MS technology. Microscopic analysis combined with state-of-the-art genetic technologies provides correct identification and physical qualities of specific herbs to help promote their uses, conservation, medicinal values and chemical properties.
The Herbal Technology Section also handles training programs and advisory services to various industries. Out of these services, the cosmetic industry and plant and tissue culture take premier positions. In addition to services offered by The Herbal Technology Section, it actively promotes the uses of unique and natural plant resources of our country which is priceless to improve Sri Lanka's economy.

Inquiries:
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Senior Deputy Director
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Environmental Technology Section

The Environmental Technology Section of the ITI also belongs to the Research and Development Division, which provides a remarkable service to the country. The main objective of this Section is to provide solutions and advisory services to the environmental sector upon the evaluation of various environmental concerns arising from the industrial sphere of the country. To achieve these important goals, this section is staffed with several Research Scientists and Research Engineers.

This Section offers advisory services to minimize environmental impacts caused by noise, air and water pollution. In addition, it is closely engaged with the development of technologies to safely store harmful chemical by-products that could be otherwise released to the environment from various industries. This Section also takes the lead in dealing with the climate-change issues by, for example, introducing low-cost refining systems in wastemanagement. Currently, ITI is in the process of establishing international research contacts to increase the efficiency of the current processes with the ultimate goal to obtain International Compliance Certification for this process in the future.

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Pilot Scale Reverse Osmosis Plant

Food Technology Section

The Food Technology Section belongs to the Research and Development Division. Accordingly, the objective of the Food Technology Section is manufacturing new food items and conducting technical research on market requirements. Here, food technology knowledge is given to any market, whether small or large scale. The main tasks of the Food Technology Section are conducting research on new recipes, supplying advisory services, solving problems related to the production of food and holding training programmes. Government and non-Government institutions contribute to the research projects conducted by the Food Technology Section. Monetary contributions for research projects are made by overseas institutions such as IDRC of Canada, JICA of Japan and NORAD of Norway and local institutions such as the National Treasury, the National Science Foundation and the National Research Council (NRC). Other than these, new inventions are introduced through the connections built up with various parties in the market. The Food Technology Section is operating under seven main sections and laboratories to achieve these tasks. Those are post-harvest technology, processing fruit and vegetables, processing cereals. Processing sea food, Food Nutrition Unit, Microbiology Unit and the Pilot Factory.

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Food Technology Section
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Information Services Centre

Information Services Centre is open from 8.30 am to 4.15 pm on weekdays and from 8.30 am to 12.30 pm on Saturdays for all information required by students, researchers and entrepreneurs. Persons and organizations obtaining membership are entitled for lending library services.

Materials Technology Section

Materials Technology Section carries out customized special projects and contract research projects. Specially conducts research on ceramic, minerals, wood and natural fiber (Ex: coconut fiber and banana fiber.) specialized in analyzing material with Electronic Microscope, and highly technical equipment such as FTIR and XRD. Materials Technology Section specializes in material characterization. Carries out research services on analytical skills and specialized knowledge (on rubber & plastics, wood & cellulose, minerals & ceramics & advanced materials & nano materials.

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