

ANNUAL REPORT 2021

Industrial Technology Institute

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CHAPTER 01: INTRODUCTION

1.1 Vision, Mission and Quality Policy

Vision

To be a centre of excellence in Scientific and Industrial Research for national development.

Mission

To conduct innovative R and D and provide internationally competitive technical services to accelerate industrial development for the benefit of the people of Sri Lanka.

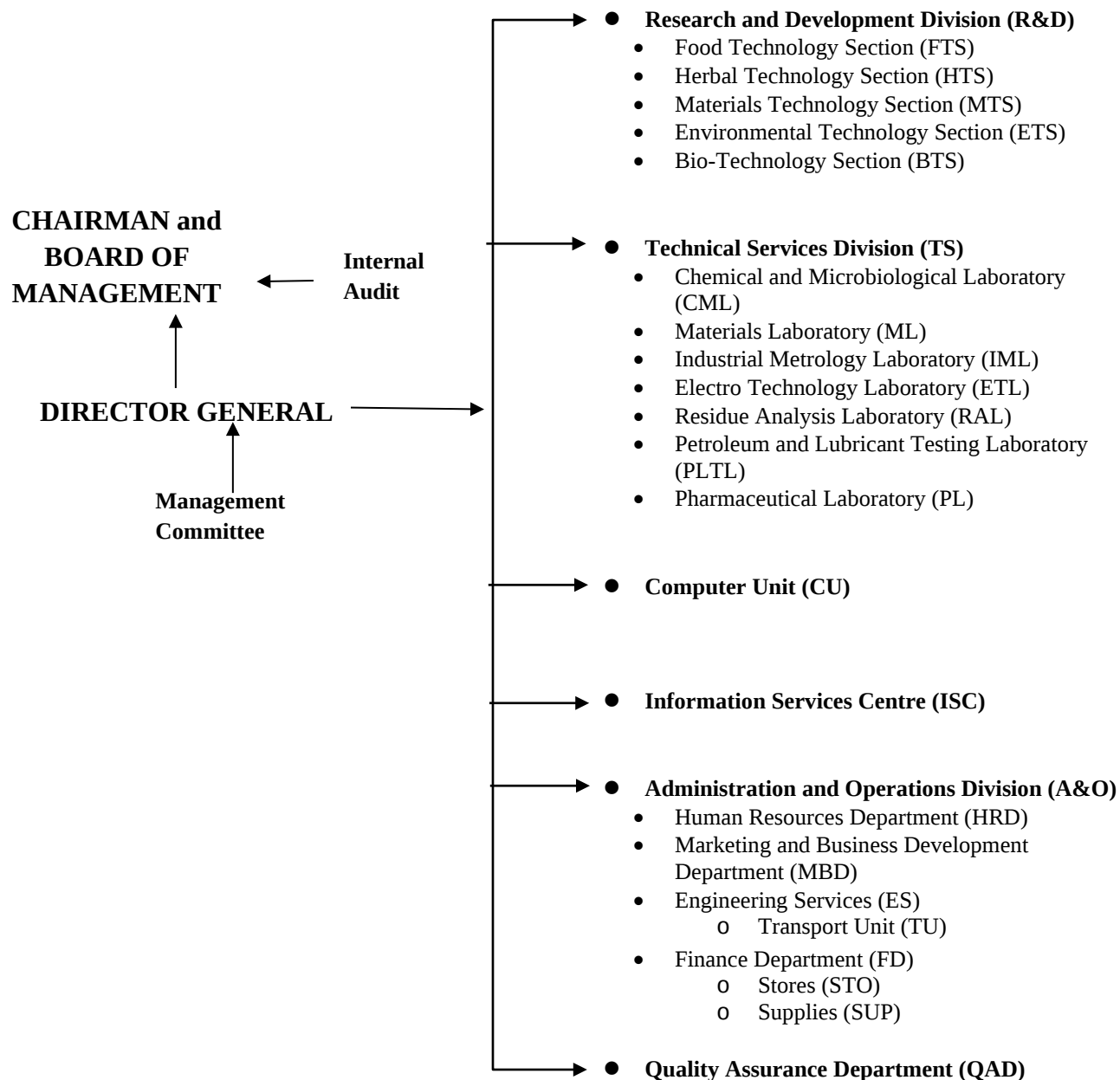
Quality policy

The top management of the Industrial Technology Institute is unreservedly committed to professional practices, in compliance with the ISO/IEC 17025:2017 and ISO 9001:2015 standards as well as the National Quality Policy and to the quality of its activities in serving customers through continual development by establishing and reviewing quality objectives.

The standard of services is never being compromised and the entire staff of the institute endeavors to achieve the highest level of customer satisfaction through maintaining Quality Management Systems (QMS) and providing independent and unbiased factual data to its customers in accordance with the stated methods and customer's requirements.

All ITI staff is competent with the quality documentation and implemented policies and procedures in their work and is therefore committed to continually improving the effectiveness of the QMS.

1.2 Organizational structure



CHAPTER 02: STRATEGIC PERFORMANCE

2.1 Chairman's Message

It is with great pleasure that I am extending this message to the Annual Report - 2021 of the Industrial Technology Institute(ITI).

As the premier R&D institute in Sri Lanka, ITI has expanded over the years from its inception in 1955 to a larger multidisciplinary research and testing institution that provides technologies and analytical testing services for industrial development in the country. With many challenges due to the global pandemic, the institute has made a progress in meeting both the financial and non-financial targets set forth at the beginning of the year.

The present Board of Management (BOM) is completing its 2nd year in office and directed ITI management to meet its mission in the new normal situation by introducing strategic reforms to the existing operational structure while addressing the 4th generation industrial technology needs. In this context, it was proposed to operate ITI in five different platforms viz Industrial Research, Incubation & Manufacturing Platform, Industrial Testing Platform, S & T Business Platform, S & T Higher Education Platform, and Advance Scientific Research Platform. Industrial Research, Incubation & Manufacturing Platform addresses the needs of the customized R&D for the industry, and the incubation and manufacturing part address the needs of the startups and contract manufacturing for a given period for startups until they get their own manufacturing facilities established. S & T Higher Education Platform provides the opportunity for higher research degrees using the existing qualified R&D staff of ITI and the available laboratory, high-end instrumental and human resources collaboratively with the university system in the country. While S & T Business Platform provides a one-stop-shop for the S&T needs of the stakeholders, the advanced research platform will address the need of high-tech cutting-edge research for knowledge-based economic needs. Under the advanced research platform, we have proposed 9 new research centers namely Climate Change & Resilient Technology Research Centre, Organic & Traditional Agro Technology Research Centre, Marine Resources Research Centre, Pharmaceutical Research Centre, Biomedical Engineering & Clinical Research Centre, Green Energy Research Centre, Advance Telecommunication Research Centre, Mineral Resources Research Centre, and Health Food Research Centre. These centers are proposed to be set up within the existing infrastructure and utilizing the highly trained scientists, Engineers & Technologists at ITI with relevant expertise. The research students to work in these centers are to be mobilized from the students registered at the S&T higher education platform. The BOM is very optimistic about these proposed reforms and the operation of ITI within the proposed five platforms.

The progress made by ITI Scientists, Engineers and Technologists in the year 2021 on developing technologies for the industry, their outputs on R&D work in terms of publications, research communications, citations of their work, receiving of S&T awards, etc, and strengthening of knowledgebase were within an acceptable level when we consider the difficulties the S&T personnel, in general, had to undergo due to the pandemic, political instability, and economic downturn. Hence, I take this opportunity to congratulate those who completed their PhDs and

Masters degrees in 2021 and those who develop innovative products and technology transfers and the technical services provided to the industry, and everybody who contributed to the image of this premier R&D institution.

A handwritten signature in black ink, appearing to read 'Dr. Sirimal Premakumara', enclosed within a thin black rectangular border.

Dr.Sirimal Premakumara PhD
Chairman

2.2 Director General's Message

For more than 66 years, the Industrial Technology Institute (ITI), successor to the Ceylon Institute of Scientific and Industrial Research (CISIR) has been solving numerous challenges through Science, Technology and Innovations and promoting industrial development through Research and Development (R&D), Technology Transfer, Consultancy, Training and internationally competitive Testing and Calibration Services for the economic development of the country. ITI has functioned under the Ministry of Technology in 2021.

The COVID-19 global pandemic disrupted many domains of Sri Lanka including ITI, from March 2020 to 2021. Major areas of testing and calibration, R&D services, supply chain and logistics were disrupted due to COVID-19-related lockdowns and only being able to work with minimum staff. However, in 2021, ITI strategically handled the situation and faced these challenges with commitment, creativity and perseverance, making contributions to local industries during the pandemic. To fully play our role as the guarantor of technological leadership and technological sovereignty of Sri Lanka, ITI displayed a high degree of resilience in 2021 and provided its services under new normal conditions.

This Annual Report provides the strategic performance including an action plan, a summary of ITI activities, performance highlights and outcomes of the planned objectives; monitoring and mitigating pollution, financial performance, and the delivery of quality services to the government, industries, non-governmental organizations and the community at large in 2021.

First and foremost, I appreciate the invaluable guidance and advice received from the ITI Board of Management. Second, I am very grateful to the ITI Management Committee, ITI staff and colleagues who maintained operational continuity while undertaking special assignments with deep commitment, dedication, and collaborative spirit, and adopted a multidisciplinary approach to scientific and administrative work. If not for their unstinted support and cooperation, ITI would not have been able to meet its targets in tumultuous times caused by the economic conditions due to the COVID-19 pandemic that prevailed in 2021.

In 2021 we continued to focus on Science and Technology and Innovation in areas that are aligned with government priorities, a National Policy Framework 'Vistas of Prosperity and Industrial demand while facilitating the transition of research and commercialization of research outcomes. During the year, ITI undertook more than 16,000 services including testing and calibration, technology transfers, consultancy, contract projects, and training and worked with more than 20,000 customers, including Sri Lankan Industries, International Corporates, and over 1500 Small to Medium Entrepreneurs (SMEs).

ITI continued its long-standing collaborations, new collaborations and joint programs with the Commission on Science & Technology for Sustainable Development in the South (COMSATS), the World Association of Industrial and Technological Research Organization (WAITRO), the

International Bamboo & Rattan Organization (INBAR), United Nations Industrial Development Organization (UNIDO), Food and Agriculture Organization of the United Nations (FAO), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), United Nations Development Programme (UNDP), Ministry of Science and Technology of China, Yunnan Rural Science and Technology Service Center and Yunnan Agricultural University in Kunming in China, International Center for Chemical Biological Sciences (ICCBS), University of Karachi, COMSATS University Islamabad (CUI), Pakistan, the University of Toledo, USA and Centre for Environment Fisheries & Aquaculture Science (Cefas), UK.

Technology Transfers

Among the technologies transferred, Kithul spread, jack-based vegan burger patty, cashew milk beverage, fruits, vegetables and coconut minimal processing and freezing technologies, herbal cosmetics and an elephant early warning and alarm system were the key technologies.

Among the technologies transferred previously, Raga brand alcoholic Kithul beverage, Dulme brand complimentary food mixture, Soul brand bottled iced coffee latte, iced coffee chocolate, iced coffee hazelnut and black coffee and vegan fresh cut jak fruit and the frozen fruits and vegetable products were commercialized through local retail markets and exports.

Further, more than 122 technologies were transferred to Micro, Small and Medium Entrepreneurs (MSMEs) assisting them in initiating new businesses or upgrading or scope expansion of ongoing businesses. Technologies transferred to SMEs include herbal-based products, ready-to-serve drinks, fruit and vegetable dehydration technologies, spice processing technologies, Jak fruit-based products, ginger value-added products, turmeric value-added products, herbal teas, and homecare products.

ITI also continued to provide technologies to build up and promote Micro Enterprises (MEs) and SME engagement in rural industrial promotion and women empowerment, especially through Vidatha Centres and Vidatha Entrepreneurs. Furthermore, to achieve poverty alleviation and economic revitalization through strengthening the household economy, which is one of the flagship development programs of the current government for a people-centred economy and livelihood development, ITI was involved with government organizations to provide technical support.

Research and Development and Innovation

We consider it a privilege to serve the Nation through outstanding research, technology and innovation. As the leading national government-owned, largest scientific R&D organization, ITI continues to deliver our core objective of delivering technology innovation to the entire nation working in collaboration with the government, research network, industry and universities, both in Sri Lanka and globally. In 2021, fifty-five ongoing R&D projects were designed based on

industry and consumer demand and these projects were in the areas of food, health, biotechnology, materials, environment, natural resources, metrology, electrotechnology and future industries. Many technologies were developed through these projects for commercialization. ITI thus successfully addressed technical issues and provided solutions to the industry and society.

The key technologies developed through R&D for commercialization include fish-based liquid fertilizer, Nas Narang sports drink, surface sterilization of spices using the non-thermal process, spray drying of fruit and vegetable juices and yam pulp to produce fruit, vegetable and yam powders and milk-based spray-dried powders, value-added products from Ceylon cinnamon and essential oils, value-added health products incorporating underutilized medicinal plants, lubricant products from local graphite, bamboo charcoal, bamboo wood pulp, composite material utilizing bamboo wastes, a graphite-based composite electrode for electrochemical applications, upgrading and purifying graphite, biodiesel from underutilized fixed oils such as palm sludge and coconut sludge, and, wastewater treatment plant for the graphene production process and fibre extraction method from Kithul leaf sheath and leaflets.

Technical Services

Following the hands-on experience and successes of ITI's testing services, in 2021 we continued to deliver these internationally recognized accredited services across the span of ITI's deep domain expertise to local industries and governmental organizations. These testing services were in areas of chemical, water, wastewater, food, agro products, cosmetics, pharmaceuticals, pesticides, alcohols, materials, lubricant and petroleum oil, microbiology, packaging and herbal drugs, spices and essential oil, biotechnology, environmental pollution and mitigation and trace level environmental contaminants, such as pesticide residues, heavy metals and mycotoxins and for national metrology infrastructure.

In 2021 ITI contributed to many national issues undertaking testing services including LPG sampling and analysis, testing of LPG regulators and hoses, analysis of heavy metals and microplastics in sediment and seawater samples as an immediate service to investigate the damage caused by the ship wreck of MV X-Press Pearl, a container ship on the western coast of Sri Lanka, analysis of aflatoxins in imported edible oils and oil refinery industries, analysis of imported canned fish for the presence of arsenic and other heavy metals, testing of organic fertilizers due to the high demand created banning on chemical fertilizers imposed in April 2021, analysis of total fatty matter to ensure quality and authenticity of toilet soaps, analysis of generally specified alcohol grades (isopropyl alcohol and ethanol), other types of harmful alcohols (methanol), the presence of lower grade alcohol in hand sanitizers and disinfectants and representing in ministerial level expert and advisory committees.

The food Technology Section started the process of validating the coconut oil refineries in Sri Lanka as a request made by the Coconut Development Authority to address the quality issues raised during the past few years in the country. The Electro Technology Laboratory (ETL) started

acoustic modelling services for the first time in this nature using the design and simulation facilities at the laboratory for a proposed multipurpose auditorium of Sir John Kotalawala Defense University.

ITI also conducted more than 500 services in various disciplines of environmental technology including ambient air quality and stack emission monitoring using the ITI mobile laboratory, air pollution control and mitigation, wastewater treatment, solid waste management, water quality studies, hazardous waste management, baseline surveys and Environmental Impact Assessments in 2021. Noise and vibration assessment studies including measurements, mitigation and prediction were also provided to power and energy, road, highways, industry and shipping sectors in the country.

During the review year, new testing services were established including the masks testing facility, alcoholic beverage testing for the Exercise Department, analysis of Polychlorinated biphenyls (PCBs), expanding the scope of ITI to assist the local industry and export industries and support COVID-19-related product testing.

Quality Infrastructure

The Institute continued with the ISO 9001:2015 Quality Management System Certification for R&D Division and Information Services Center. ITI's existing Laboratory Quality Management system, ISO/IEC 17025:2017 was maintained for Technical Services Division and more than 700 testing parameters are accredited by the Sri Lanka Accreditation Board (SLAB) for chemical, food, and water, wastewater, cosmetics, materials (cement, rubber and ceramics), microbiological parameters, chemical residues, metal residues and industrial noise and vibration measurements. Industrial Metrology Laboratory continued ISO/IEC17025:2017 Laboratory Quality Management System for mass, dimensions, volume, electrical, force, pressure and temperature measurements and measurement traceability to SI units through Korea Research Institute of Standards and Science (KRISS), South Korea and Physikalisch-Technische Bundesanstalt (PTB), Germany, NIST, USA, Danak Denmark and National Metrology Institute, Thailand.

ITI was designated as the first official testing laboratory for tea testing by the Sri Lanka Tea Board and Residual Analysis Laboratory has the ISO/IEC 17025:2017 accreditation status for MCPA, Glyphosate and Diuron testing in exported Tea. The newly established Pharmaceutical Laboratory, Packaging Laboratory, and Petroleum and Lubricant Laboratory are in the progress of implementing of ISO 17025:2017 Laboratory Quality Management System. The Herbal Technology Section and Biotechnology Section of the R&D Division are in a process of implementing ISO 17025:2017 Laboratory Quality Management System for essential oils and GMO testing, respectively during the reviewed year. As the first Sri Lankan Proficiency Testing (PT) provider conducted 3 Proficiency Testing programs in water and food and maintained accreditation status according to ISO 17043: 2010.

Infrastructure Development

Under the EU Sri Lanka Trade-related assistant project, the UNIDO has provided technical support to establish a packaging material testing laboratory at ITI. The required instruments and training for the packaging testing laboratory were granted by UNIDO. Under the MOU signed with the Ministry of Science & Technology (MOST) China and the Ministry of Higher Education Research Sri Lanka and the framework agreement ITI signed with Yunnan Rural Science and Technology Service Center and Yunnan Agricultural University in Kunming in China, ITI received an equipment grant value of USD 600,000 for the China Sri Lanka Joint Laboratory on Biotechnology to undertake R&D on special plant resources, Tea, Cinnamon and Moringa and their industrial applications. The laboratory equipment was installed in the newly established China-Sri Lanka Joint Laboratory on Biotechnology.

In 2021, with the COVID-19 pandemic, a flexible, participatory working environment was provided for ITI staff during the lockdown and WFH periods and staff were able to access internal resources directly through VPN. As a member of the LEARN Identity Access Federation, ITI was able to use zoom and webinar facilities in 2021. SMART payment system, Lanka QR, Payment through the BOC biller app and Internet payment gateway were introduced for customer payments. Integrated Software System (ISS) implementation was mostly completed during the year. Further upgraded the ITI inet, installed SPAM filter system and established a fully equipped conference facility during the year.

Awards, Patents, Publications and Recognitions

ITI Scientist won a DASIS award in the open category under the technical field of Agriculture for the development of a natural agricultural pest control agent (NAPCA) by using Sri Lankan-grown medicinal and aromatic plant extracts for the control of sucking agricultural pests. ITI Scientist won a Gold medal in the open category under the technical field of Applied Science and Technology for the development of a clay filter for the removal of fluoride, arsenic and cadmium from drinking water. ITI Scientists won two Silver medals in the open category under the technical field of Agriculture for the development of a natural fungicide and post-harvest quality enhancer and in the technical field of Food Technology for the development of Dulme pro-cooked cereal mixture for children and adults. ITI Scientist won a Bronze Medal in the open category under the technical field of Food Technology for the development of the isotonic Nas Narang sports drink. All the above awards were at the awards ceremony organized by the Sri Lanka Inventors Commission. Two Scientists received the President's Award for scientific publications.

In 2021, 40 research articles were published in refereed journals and 70 abstracts were published in local and international symposium proceedings. In addition, three patents were obtained while applications were filed for one local patent during the year.

Human Resource Development

Forty-five staff including an Additional Director of General Technical Services, Research Scientists and Engineers, Research Technologists and a Chief Internal Auditor, a Director of Administration and Human Resource Development, an Institute Secretary, a Senior Marketing Officer, an Internal Auditor, a Senior Legal Officer, an Accounts Officer, an Internal Audit Officer, Librarian, Senior Stores Officer and Management Assistants were recruited in 2021.

During the year under review, two Research Scientists obtained their PhD while two Technologists completed their Master's degrees.

Financial Performance

A capital grant of Rs 53.97 Mn and an allocation of Rs 80 Mn were received in 2021. These funds were utilized to purchase high-end equipment for Research and Development and Technical Services to generate more income through new technology development and testing services. During the year, by completing the procurement process utilizing Rs 53.97 Mn out of Rs 80 Mn, ITI was able to record its financial progress as 66%. ITI also received Rs 279.8 Mn in 2021 as a recurrent grant for compensating Personnel Emoluments of the Institute.

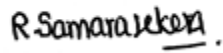
The Institute's income has increased from Rs 285 Mn in 2020 to Rs 321 Mn in 2021 even under COVID-19 lockdowns and working with minimum staff during the year. While the recurrent expenditure marginally increased from Rs 553 Mn to Rs 579 Mn during the same period. The income/recurrent expenditure ratio increased from 46.4% to 55.3%. The Institute generated a high percentage of its income from testing and calibration services which contributed 61% (Rs 196 Mn) of the generated income while income from technology transfer, training programs including technology training, customized services and contract projects remains at 39%. Income from Technology transfers showed a slight increase from Rs 11.5 Mn in 2020 to Rs 13.1 Mn in 2021. However, the Contract project and Training income decreased due to the COVID-19 pandemic.

As a resilient strategy during the pandemic lockdown, ITI started production of hand sanitizers with necessary approvals from the government in 2020 and it contributed Rs 61.24 M to total income in 2021. The performance-based incentives were paid to the staff for the 18th consecutive year as the Institute achieved an overall income target set for the year.

I am confident that ITI will endure for the foreseeable future as we evolve and continuously adapt to the changing environment. ITI will be contributing the maximum in shaping and guiding Sri Lanka's economic recovery especially due to the COVID-19 global pandemic and economic instability in the near future. This Annual Report showcased the initiatives launched by ITI in adapting and responding to the changing environment and industry demand to meet its objectives and deliver targeted R&D and Testing Services for a better future for all citizens in Sri Lanka.

Acknowledgement

Chairman and the Board of Management, Management Committee, Staff, Line Ministry, Clients, Stakeholders and Donator Agencies.

A handwritten signature in black ink, reading "R. Samarasekera" with a small underline under the name.

Dr J K R R Samarasekera
Director General /Chief Executive Officer, ITI

2.3 Action Plan

No	Name of the Project/Activity relevance to the National Policy Framework 'Vistas of Prosperity and Splendor'	Brief description of the project	Progress
01	Chapter 04: A Productive Citizen and a Happy Family Sub Sector: Vocational Training and Skills Development 1.1. Provide vocational and technical opportunities to needy students regardless of their academic performances ITI Activity: Conducting NVQ 4 course for Laboratory Assistance. Sub Sector: Higher Education ITI Activity: Establishment of Technology University affiliated with ITI for undergraduate and postgraduate degree offering status.	• Introduced NVQ 4 course (6 months) for Laboratory. Assistance for the first time in Sri Lanka. • Upgraded the NVQ 4 course for NVQ 5 status. • Introduced NVQ course on Food Technology targeting the food industry workforce. • Conducted laboratory practical training and research programs for Business Management Schol (BMS) undergraduates. • Conducted postgraduate research leading to MPhil and PhD degrees.	• The first batch of 20 students enrolled for NVQ 4 and ITI staff have conducted theory/practical sessions. • ITI requested NAITA to upgrade NVQ 4 to NVQ 5 level and course standard and syllabus preparation work are in progress. • Registered at NAITA to conduct a Food Technology NVQ course. • Undertaken laboratory practical training and research projects for Biotechnology degree and Higher National Diploma programs of BMS. • Budgetary allocations were requested through the capital budget. • Projects which has PhD/MPhil components and internal and external supervisors were identified. • Signed two agreements during the visit of Hon Priminister of Pakistan to Sri Lanka for joint postgraduate and research collaborations with ITI. 1. MOU with International Center for Chemical and Biological Sciences, University of Karachi. 2. IOC with COMSATS University of Islamabad (CUI).

			• Online discussions were held with CUI for possible R&D collaborations and participation in online webinars organized by COMSATS.
	1.2 Provide a wider opportunity for the existing workforce to upgrade their skills ITI Activity: Conducting training programs and group technology transfer activities in the areas of Food Technology, Herbal Technology, Materials Technology, Biotechnology and other related areas.	• ITI conducted technology training programmes and technology transfers in different areas for entrepreneurship development and scope expansion of businesses to provide knowledge on product processing, process upgrading, selection of packaging material and machinery, labelling and quality assurance etc. • Conducted online international and local training programmes in Molecular Biology and Bioinformatics areas. • Conducted Internship training programmes and research programmes for the Higher National Diploma students of private Universities. • Conducted awareness programs, and webinars and invited presentations to popularize ITI activities among stakeholders in postharvest management, value-added agro, herbal and material technologies and technical analysis. • Participated in scientific exhibitions and popularized ITI technologies and services	• More than 400 technology training and other training programmes were conducted in the areas of food, herbal, materials, chemical, environmental and biotechnology. • More than 122 technology transfers and 70 contract projects related to the above areas were undertaken including technology development and transfer, spice processing and minimal processing and freezing technology of fruits and vegetables and coconut, Kithul spread, jack-based vegan burger patty, cashew milk beverage, dragon fruit beverage and related food products, herbal-based cosmetics and herbal-based value-added technologies, pet shampoo and home-care products. • Some of the technologies transferred by the Food Technology Section (FTS) (Soul brand bottled Iced coffee, Dulme brand complimentary food and Vegan fresh cut jak fruit) were commercialized through the supermarkets and retail markets The frozen fruits and vegetable technologies were commercialized to the Australian market and the jak-based burger party to exports. • Current issues and government priority areas such as turmeric processing, postharvest loss reduction and value addition to agriculture crops, products to combat with COVID-19 pandemic, import substitution, export promotion, quality maintenance of coconut oil, toxin-free food product technology etc.

		to industries and the general public. • Established ITI Techno Centre at Rajawasa mall, Narahenpita Economic Center to showcase new technological innovations which are ready for technology diffusion and key technologies already commercialized. • Established ITI S&T Business centre for technology transfer and as a platform and one-stop shop for industrialists and businesses to obtain technologies and R&D and testing services of ITI.	were mainly addressed in technology development and transfer. • Three online programmes were conducted with the participation of 140 both international and local participants on theoretical and practical knowledge of Molecular Biology and Bioinformatics. • Biotechnology and Molecular Biology based 2 weeks of laboratory Internship Training programmes and 3 months research programmes were conducted for the students of Higher National Diploma of Business Management School. Two batches were completed during the year. • Conducted more than 13,000 food and non-food product analytical testing services based on customer requests. • Showcased ITI technologies at ITI Techno Centre established at Rajawasa Mall, Narahenpita. • Eighteen awareness programmes were conducted for Export Development Board, Government Medical Officers Association, Institute of Food Science and Technology, Small Enterprises Development Unit of the Ministry of Sports and Youth Affairs, Sri Lanka Association for the Advancement of Science, COSMI, Umandawa innovation center and Vidatha etc.
02	Chapter 04: A Productive Citizen and a Happy Family Sub Sector: Western Medicine Popularization of toxin-free healthy meals ITI Activities:	• Eleven R&D Projects on healthy food development are being conducted, ex: the nutritional and functional properties of traditional rice, value addition to milk and whey protein, value-added healthy food, development and	• A range of spray-dried fruit and vegetables and herbal and milk-based products were developed and ready for technology transfer. • Development of value-added functional whey-based beverages, milk and grain-based functional food products and vegan foods using plant proteins,

	2.1. Research and development projects targeting healthy food development and technology commercialization	quality improvement of tea, novel food formulation to combat NCDs, value-added products from underutilized food crops/herbs, value addition to citrus, development of vegan food and meat analogues etc. are ongoing.	mushrooms and jack are in progress. Jack-based burger patty technology was transferred to two food-based companies. • Functional foods and beverages such as Nas Narang-based sports drinks, Kithul paste, coffee paste, and Gotukola beverage technologies are ready to transfer.
		• Immune boosters using turmeric, pepper, ginger and herbs to combat COVID-19 were developed.	• More than 10 product technologies developed were advertised for technology transfer and commercialization. • R&D on the development of immunity-boosting products incorporating Sri Lankan medicinal plants to prevent infectious diseases is continuing.
	2.2 Popularization of organic food development	• Conducted R&D projects on organic-based fungicide and pesticide development. • Additive-free food product development. • Fish waste-based organic liquid fertilizer development. • Established organic fertilizer testing facility and funding opportunities through GIZ to upgrade the testing facility.	• Two R&D projects on organic-based fungicides and pesticides are ongoing. One biopesticide was developed and is ready for technology transfer. • Around 150 samples for pesticide residue analyses were undertaken at ITI Residue Analysis Laboratory (RAL) each month. • One project on Additive-free food product development is ongoing. • Product development is ongoing for a fish waste-based organic liquid fertilizer. • Organic fertilizer testing, biopesticide testing and irrigation water quality testing were undertaken at the Chemical and Microbiology Laboratory (CML).
	2.3 Promote proper eating habits at all ages	• Introduced food processing techniques through workshops. • Continued upgrading Vidatha Entrepreneurs' food products to reach the high-end markets.	• More than 15 training programmes were conducted by the FTS to support the industry with proper food processing technologies for value addition. • More than 100 of the food products of Vidatha Entrepreneurs were upgraded

		• Training food industries on proper processing techniques during the COVID-19 pandemic period.	by addressing food quality and introducing safety measures/standards. • Four training programmes were conducted for participants from different food industries.
	2.4. Create a healthy environment by preventing pollution of air, water and soil through a sustainable environment policy	• Conducted air quality analysis and issued test reports. • Undertaken consultancy and contract projects for the industry for air quality monitoring, environmental pollution and control and wastewater treatment, environmental impact assessments etc.	• More than 600 services on air quality monitoring were conducted. • More than 300 consultancy and contract projects were undertaken by the Environmental Technology Section. • Testing services for sanitizers, disinfectants, facemasks and herbal products were undertaken. • Testing services for drinking water quality, soil and fertilizers were undertaken and more than 1500 samples were analysed.
	2.5 Indigenous Medicine and Ayurvedic-related R&D	• Nine R&D projects on herbal-based products/indigenous medicine development are ongoing. • Ayurveda product testing was conducted upon customer requests to obtain Ayurvedic registration including herbal cosmetics.	• New value-added health products incorporating underutilized bioactive medicinal and aromatic plants to address lifestyle diseases in Sri Lanka are in progress. • R&D on pharmacognostic, chemical characterization, bioactive properties and value-added products of <i>Canarium zeylanicum</i> is commenced. • Development of a low-cost adulteration detection kit for Ayurvedic & food industries is in progress. • Development of a user-friendly non-destructive, high-tech portable IR device to authenticate and geotag Sri Lankan bee honey is commenced. • More than 800 test services were undertaken during the period.
03	Chapter 5: People-Centric economy ITI Activities:	• Training programs, webinars and invited presentations were conducted for industries and the general public on post-harvest	• Three training programs and three webinars on postharvest loss reduction and value addition were conducted. • Five technology training programs were conducted to introduce postharvest

	3.1 Post-harvest loss reduction 3.2 Research for Agricultural innovation	loss reduction and value addition to crops. • Post-harvest technology, packaging, cold chain management, minimal processing, and frozen and value-added fruit and vegetable technologies were introduced to the industry for new entrepreneurship. • Research on enhancing the nutritional status by introducing healthy food products from jak, pumpkin, banana and fish while reducing post-harvest losses of these commodities.	protocols targeting the export industry and supermarkets-more than 60 participants from the industry benefited from the programs. • Around 30 innovative products were developed from jak and pumpkin two major agricultural commodities which have high postharvest losses. • Jak-based burger patty technology was introduced to the international market. • Four new industries were established on jak fruit-based products. • More than 20 technology transfer programmes related to postharvest management and value addition and Agri innovations were conducted.
	• R&D on Rubber	• Research on improvement of thermal conductivity of rubber.	• Graphite-based nanocomposite technology to improve rubber thermal conductivity is ready for technology transfer.
	• R&D on Cinnamon	• Research on cinnamon value addition.	• A range of cinnamon-incorporated herbal cosmetics was developed and is ready for technology transfer. • Conducted initial discussions with the International Finance Corporation (IFC) to acquire funds to improve the quality and safety of cinnamon processing facilities and to develop value-added products from cinnamon waste.
04	Chapter 6: Establishing a Technology-Based Society (Biotechnology, Nanotechnology, Electro technology-related R&D developments, technology transfers and R&D services)	• Research on Biotechnology, Nanotechnology and Electrotechnology innovations.	• Biotechnology-related research projects are ongoing, focusing on PCR-based food testing, nano-based rapid detection strips for the dengue virus, whey-based value-added functional beverage development etc. • The development of a PCR-based method for the detection of plant-based adulterants in turmeric and tea is commenced.

			• The PCR-based methods to detect porcine, bovine, buffalo, rat and dog species adulteration in raw and processed meat products were developed. • Detection methods for simultaneous identification of CaMV35S promoter and T Nos terminator by Real-Time PCR for identification of GMOs were introduced. • Development of separate Real-Time PCR for detection of <i>Salmonella</i> and <i>S. aureus</i>. • A low-cost electrode modified by controlled synthesis of a nanofiber network of homo/copolymer of aniline and pyrrole on graphite-clay composite substrate for supercapacitor applications is in progress. • Purification of Sri Lankan graphite as a high-value addition is in progress. • Development of lubricant products from local graphite and enhancement of lubricant properties with nanomaterials are in progress. • A stable composite based on titanium dioxide and clay as an effective photocatalyst for wastewater treatment is commenced. • Automotive rechargeable cost-efficient battery manufacturing technology for SME startups is commenced. • R&D on AI-based elephant detection & HEC mitigation platform is commenced. • Development of Infra-Red thermometer calibration system and measuring tape calibration system are being developed.
		• Research publications, patents and other scientific achievements.	• 28 peer-reviewed journal publications. • 90 communications/abstracts. • 03 patents received.

			• 02 patents applied. • 08 national awards. • More than 150 industry tie-ups for potential technology development and transfer. • ITI signed 10 agreements and MOUs with international universities, industry, ministry, and other authorities for technology and research partnerships. • Thirty-two new research grants addressing national priority areas of Vistas Prosperity and Splendour were granted. These proposals are related to food technology, herbal technology, chemical technology, biotechnology, material technology and environmental technology.
		• Scope expansion and Establishment of new laboratories at ITI.	• China-Sri Lanka joint Biotechnology Laboratory with Yunnan Rural Science and Technology Service Center, Yunnan Agricultural University and the Kunming University of Science and Technology-Interior decoration and equipment commissioning was completed. • The establishment of the national LMO/GMO laboratory - Equipment received through the collaborative program of the Ministry of Environment and FAO was commissioned. LMO/GMO testing was commenced for the industry. • Upgrading the packaging testing laboratory-Testing is successfully continued. • Establishment of Petroleum and Lubricant Testing Laboratory- Testing is successfully continued.

			• Supplying quality guaranteed alcohol-based hand sanitizers to Sathosa outlets through STC.
		• Other activities: Testing services, consultancy, contract projects and other services undertaken by ITI to support local industries and export promotion etc.	• More than 13,000 testing services were undertaken to support the industry. • More than 450 consultancies were undertaken to support the industry.
05	Chapter7: New approaches in a national spatial system	• Urban waste management, industrial sewage and wastewater management.	• Conducted several consultancies (more than 230 Nos) on hazardous waste-generating industries in Sri Lanka. • Anaerobic digestion technology is used for poultry wastewater treatment. • R&D on a technical guideline to facilitate appropriate disposal of wastewater in the industries and application of an integrated solution for laboratory wastewater treatment in Sri Lanka are commenced.
06	A Righteous Disciplined and Law-Abiding Society Training of Vidatha entrepreneurs/women empowerment	• Technology training for Vidatha, Samurdhi and Small Enterprise Development Unit (SED) entrepreneurs. • Women empowerment programs.	• 24 technology transfer and product upgrading workshops were conducted for more than 100 Vidatha entrepreneurs. • As most Vidatha entrepreneurs are women, contributed to women's empowerment in the country.

CHAPTER 03: GOVERNANCE AND REMUNERATION

3.1 Board Matters

The ITI Board of Management is vested with the administration, management and control of affairs of the institute and thus approves the mission, strategy, goals, operating policies and priorities for the Institute and monitors compliance with policies and achievement against objectives.

3.2 Board of Management

The Minister in charge of Technology appoints the Board members for a term of three years. The Board comprises a Chairman, the Director General of the ITI, the Secretary to the Ministry of the Minister in charge of the subject of Finance or his nominee, the Chief Executive of a lending institution funding technology transfer and technology development, and not more than five other members appointed by the Minister from among scientists, technologists and industrial entrepreneurs. All members of the ITI Board other than the Director General are non-executive members. The ITI Board which presently comprises 08 members as follows meets monthly.

as at 31st December 2021

Chairman

Dr. G A S Premakumara

Members

Dr. Radhika Samarasekara
Director General

Ms. Samadara Jayarathne
Ministry of Finance

Prof. A L T Perera
Emeritus Professor

Dr. Aruna Champika Jayakody
Executive Director
Melsta Hospital, Ragama

Eng. W H S P Withanage
Consultant, Civil Engineer

Mr. Dinesh Kumara
Founder Inspire X (Pvt) Ltd.

3.3 Management Committee

The Director General with the assistance of the Management Committee manages the organization. The Management Committee comprises 3 Additional Director Generals, 12 Technical Directors, 3 Administrative Directors, Chief Engineer and Chief Internal Auditor. The Technical Directors are appointed on 3-year contracts and once the term is over new/reappointments will be done with panel interviews.

The Committee conducts monthly committee meetings chaired by the Director General, who is responsible for the execution of the organization's strategy and reports to the Board of Management.

as at 31st December 2021

Director General
Dr. J K R R Samarasekera
Additional Director General, Research and Development
Prof. Ilmi G N Hewajulige

Additional Director General, Technical Services
Dr. H P P S Somasiri

Additional Director General, Administration and Operation
Vacant

Research and Development
Dr. Neville Amunugoda
Director
Food Technology Section

Prof. R M Dharmadasa
Director
Herbal Technology Section

Materials Technology Section
Vacant

Environmental Technology Section
Vacant

Technical Services
Mr. M N A Mubarak
Director
Chemical and Microbiological Laboratory

Dr. W M S Wijesinghe
Director
Industrial Metrology Laboratory

Eng. Dr. R M Weerasinghe
Director
Electro Technology Laboratory

Eng. A T M Adikari
Director
Materials Laboratory

Bio-Technology Section
Vacant

Residual Analysis Laboratory
Vacant

Petroleum and Lubricant Testing Laboratory
Vacant

Pharmaceuticals Laboratory
Vacant

Administration and Operation

Mr. Diwan Ruwanpura
Director
Administration and Human Resources

Eng. A S Arachchi
Chief Engineer
Engineering Services

Mr. Laleen Gunaratne
Director
Finance Department

Ms. Manori Wijemanne
Director
Marketing and Business Development

Quality Assurance Department
Ms. Sajeevika Perera
Director

Information Services Centre
Ms. Purnima Jayasinha
Director

Internal Audit
Mr. Kamal de Silva
Chief Internal Auditor

3.4 Internal Audits

Internal Audit is an independent appraisal function within the Industrial Technology Institute, for the review of activities as a service to all levels of Management. It is a control which measures, evaluates, and reports upon the effectiveness of internal controls, and financial and non-financial performance as a contribution to the efficient use of resources within the organization. According to the Organizational Structure of the Institute, Internal Audit Department functions under the Chairman and directly reports to the Chairman of the Institute.

The annual function of the Internal Audit is based on the Annual Internal Audit Plan with the recommendations/approval of the Audit Committee to be approved by the Board of Management of the Institute. In addition to the audit assignments lined up in the Audit Plan, Internal Audit has

to carry out special investigations into suspected fraud or any other special assignments entrusted by the Chairman, Board of Management or the Director General of the Institute from time to time.

Further, the Internal Audit has to review and evaluate internal control systems for all activities of the entity, review performance at regular intervals for cost-effectiveness and to eliminate wasteful expenditure, etc., liaise with the external auditors and coordinate in replying to audit reports/audit inquiries of the Auditor General, follow-up the actions based on the audit findings, ascertain whether statutes, regulations, rules and circulars are being complied with, review financial statements to ensure compliance with Accounting Standards, review the implementation of recommendations/directives of the Audit Committee and Board of Management.

Three Audit Committees were held in the year 2021 at ITI. The audit Committee made the recommendation to the Board of Management along with the minutes, to facilitate taking corrective measures/remedial action on the matters reported. The Head of the Internal Audit has participated in one Audit & Management Committee held at the line Ministry in the year under review.

3.5 Remuneration

Salary

The salary for the staff of the organization is based on the Department of Management Services circular. An annual increment is granted after an evaluation by the Head of the Section.

Other Benefits

Executive officers enjoy the financial benefits entitled to public-sector professionals; Professional Allowance, Communication Allowance, Research Allowance for the researchers and Transport Allowance for the higher management. The Medical Allowance of Rs.15,000, Performance-based Intensives and the PF 380 for meeting the financial targets are entitled to the entire staff. These perks motivate the employees of ITI. Unutilized medical leave is reimbursed at the end of the year and a percentage of the medical insurance scheme is borne by the Institute.

CHAPTER 04: PERFORMANCE HIGHLIGHTS

4.1 Technology Transfers

During the review year, more than 122 technologies were transferred to Micro, Small and Medium Entrepreneurs (MSMEs) assisting them to initiate new businesses or upgrade or scope expansion of ongoing businesses. Among the technologies transferred, Kithul spread, jack-based vegan burger patty, cashew milk beverage, fruit and vegetable dehydration technologies, fruits, vegetables and coconut minimal processing and freezing technologies, herbal cosmetics and homecare products were the key technologies.

Among the technologies transferred previously, Raga brand alcoholic Kithul beverage, Dulme brand complimentary food mixture, Soul brand bottled iced coffee and vegan fresh cut jak fruit were commercialized through retail markets locally and the frozen fruits and vegetable products were commercialized to the Australian market.

Technology training was conducted on food, herbal and materials technologies for entrepreneurs of Vidatha of State Ministry of Rattan, Brass, Clay, Furniture & Rural Industry Promotion, Samurdhi of State Ministry of Samurdhi, Household Economy, Micro Finance and Self Employment, Small Enterprise Development Unit (SED) of Ministry of Youth and Sports and other MSMEs targeting rural industrial development and women empowerment. Technical support was provided to upgrade the Umandawa Innovation Center at Umandawa global Buddhist village in Malsiripura.

Commercialization of complementary food mix, precooked cereal mixture for children and adults

Precooked cereal mixture, a complementary food was commercialized under the “Dulme” brand as a nutritional food supplement for children and adults for their sustainable growth, development and health. Those types of foods provide adequate calories, proteins and other micronutrients. The product is an instant dry mix containing hygienically pre-processed raw materials in an easily digestible and acceptable form to children. The product is a gluten-free complementary food, formulated using local raw materials of red rice, corn, green gram and sesame and is a value-added product to local raw materials of cereals and pulses. This product is specially designed for children suffering from Autism Spectrum Disorder (ASD) and is free from gluten, wheat, eggs, dairy and nuts.

Bottled iced coffee

The technology for coffee-milk beverages manufactured with a range of new flavours was transferred to Soul Coffee (Pvt) Ltd in the year 2021. The product was commercialized under the brand name Soul Coffee and is available as an iced coffee latte, iced coffee chocolate, iced coffee hazelnut and black coffee.

Fresh-cut and frozen fruit and vegetable products

Technology for a range of fresh-cut and frozen fruit and vegetable products was transferred to Kestrel International Pvt Ltd. targeting the Australian ethnic market. The company was successfully exporting frozen products such as kohila ala, koss seeds, kos, thumba karavila, alu kesel, mango, kiri kos, polos, del, banana flower and many related items to Australia contributing the foreign exchange earnings to the country.

A vegan fresh-cut jack fruit technology was transferred to Mr Deshapriya W. Wickramasinghe as a turnkey micro-level project and the technology transfer package included factory location, selection and layout design and machinery specifications and product technology targeting supermarket value chains.

Preservative for palmyrah leaves

Palmyrah leaves-based crafts have a massive issue in fungal attacks. A preservative was developed and transferred to the community in the Kirinda and Tissamaharama area as a preliminary solution through Vidatha. It was recommended to adhere to good manufacturing practices during the process of palmyrah leaves from the harvest to export to overcome the potential of fungal attacks. A detailed study was proposed to the Ministry for further improvements to prevent fungal attacks.

ITI Techno Centre at Rajawasa State Trust Centre

Rajawasa State Trust Centre at the Narahenpita Economic Centre, is the only state-owned trading mall, managed by the State Trading (General) Corporation under the Ministry of Trade in Sri Lanka. The Centre was inaugurated to bring the state entrepreneurs and local manufacturers under one roof for consumers and consists of more than 78 state-owned and private-sector trade boutiques.

ITI opened a Techno Centre at the Rajawasa State Trust Centre on 11th February 2021. This one-stop ITI Techno Center facilitates especially small businesses and SMEs to obtain product technologies, branding for exports, packaging, business linkages and promotional activities. The Centre also linked the ITI packaging laboratory and accredited testing laboratories with the industry to obtain testing services from ITI to enhance product quality. Entrepreneurs get an opportunity to market their products, which are ITI technologies, at the Techno Centre.

Business Incubator Centres

A project was initiated to establish Business Incubator Centers in Hambanthota, Kurunegala and Jaffna districts collaboratively with the SED of the Ministry of Youth and Sports. An initial visit was made to Hambanthota for the site selection to establish a Business Incubation facility. These centres will assist cottage, micro industries and startups who are lacking technology know-how and are unable to invest in machinery and factory setup for production. Technical advice on improving production technology, manufacturing, market and business management will be provided till they establish up to a certain business level.

4.2 Research, Development and Innovation

4.2.1 Technology Development

As the leading national government-owned largest scientific R&D organization, ITI continues to perform demand-driven, national-importance research in food, herbal, materials, environment, chemicals and electro technologies and biotechnology to deliver technology innovations for the entire nation, working in collaboration with the government, research network, industry and universities, both in Sri Lanka and globally. ITI has conducted research and development and testing services facing many challenges to assist in combating COVID-19 through 2021.

Surface sterilization of spices using non-thermal processes

The spices harvested from rural areas are subjected to sun drying in the open air. During the long journey from the farm to the table, spices and herbs get contaminated with bacteria, fungi and moulds. The project was initiated under Indo Sri Lanka joint research programme, to conduct studies in the surface sterilization of spices using the non-thermal process to preserve the volatile compounds inherent to spices. The applicability of low-pressure cold plasma treatment for decontaminating spices was performed on black peppercorns and seeds. GC-MS was carried out to identify the components of the volatile oils extracted from both treated and non-treated black pepper powder.

Spray drying of fruit and vegetable juices and yam pulp and product development

A project was initiated collaborating with the Institute of Chemical Technology, Mumbai and Central Food Technological Research Institute (CFTRI), Mysore, India to develop carrier agent parameters to control stickiness, anti-caking and drying properties to produce free-flowing fruit and vegetable powders which have high demand globally. Two innovative product ranges, ginger, milk and tea-based spray-dried products and vegetable juices and milk-based spray-dried powders were developed. Powders were analyzed for physicochemical properties and instant vegetable juices and salad dressings were formulated.

Heating behaviour of coconut milk with different ingredients

Heat-dependent physical properties, viscosity and specific gravity at different temperatures of coconut milk with three different levels of Guar Gum and Carboxy Methyl Cellulose (CMC) were studied and the findings were verified at a commercial scale. The viscosity is greatly influenced by the addition of stabilizers at elevated temperatures while there is no change in specific gravity. Results emphasized that the addition of stabilizers and processing at high temperatures affects the rheological behaviour of canned coconut milk. The process technology is very critical for the thermal validation of UHT processing.

Value-added products from Ceylon cinnamon

Cola-type Ceylon cinnamon carbonated drink was developed using cinnamon extract, cinnamon bark oil and nutmeg oil. The product can be used as a food supplement. An anti-bacterial agent for cosmetic products was developed using Cinnamon silver nanoparticles from Ceylon cinnamon waste.

Value-added products from Ceylon essential oils

Rose fragrance which can be used in herbal infusions, perfumery formulations and cosmetic applications was obtained from the fractionation of Ceylon citronella by fractional distillation. A lavender-type fragrance for perfumery formulations and incense sticks was obtained from the fractionation of Ceylon cinnamon leaf oil by fractional distillation. Ceylon cinnamon leaf oil was fractionated by fractional distillation to obtain a few fractions to be used in Ceylon cinnamon bark oil standardization to manufacture high-grade Ceylon cinnamon bark oil as a flavour product. High pure eugenol (98.0%, w/w) as a precursor in the pharmaceutical industry was obtained from the fractionation of Ceylon cinnamon leaf oil, clove stem and clove bud oil by fractional distillation.

Value-added health products incorporating underutilized medicinal plants

The increase in consumer demand for health concerns to address lifestyle and non-communicable diseases and health products has led to a growth in the use of new herbal ingredients and technologies. Therefore, it is a timely need to identify underutilized bioactive medicinal plants with immense medicinal value that can cater to existing health needs to use them as value-added health products.

Value-added products, an anti-microbial herbal toothpaste incorporating the leaves of *Moringa oleifera* and an antioxidant-rich anti-inflammatory balm incorporating *Moringa* leaf oil were developed. The products have been standardized as per the Sri Lankan standard requirements.

Soap nut-based hand gel and surface sterilizer were developed with anti-microbial properties. Microbial efficacy was evaluated by standard method for assessment of antimicrobial activity using a time-kill procedure (ASTM procedure- E2315-03).

Moisturizing cream from pineapple waste

During food processing, a large amount of pineapple peel and the core are discarded as waste into the environment. Both pineapple peel and the core contain important aroma volatile organic compounds (VOCs) that can be used in the cosmetic industry as fragrance ingredients. Therefore, VOCs from different parts of pineapple fruit were extracted by solvent-free microwave-assisted extraction and characterized volatile components to use in cosmetic formulations. A moisturizing cream was formulated incorporating VOCs extracted from the pineapple peel extracts as a natural fragrance and the product was standardized according to SLS standards.

Value-added products from *Canarium zeylanicum*

Traditional knowledge is a rich heritage for Sri Lanka and "Kekuna", *Canarium zeylanicum* is an endemic medicinal plant yet untapped its value-added natural products. Research has been undertaken to add value to this raw material which can be used in the cosmetic, herbal and food industries. The standardized anti-inflammatory ointment was developed from the essential oil and extract of "Kekuna" bark and the product is suitable for patients having arthritis. In addition, mosquito repellent products have been formulated from essential oil and stem bark powder. An antioxidant-rich skin cream has been developed using essential oils and extracts.

Biodiesel from underutilized fixed oils

Biodiesel was prepared using underutilized fixed oil such as palm sludge and coconut sludge to support the sustainable utilization of natural resources. Fixed oils collected from expelling industries were subjected to physical refining followed by chemical treatment to minimize acid value to produce biodiesel using natural ethyl.

Utilization of bamboo wood waste

This study focused on the utilization of sawdust and other wastes generated from bamboo wood processing for the preparation of bamboo wood pulp and composite material. The bamboo pulp-based paper was fabricated in the laboratory and this technology required further upgrades for the cost-effective production of paper material. The preliminary study was undertaken on composite material development focused on the applications of panel boards, flooring etc.

Wastewater treatment plant for the graphene production process

The technology for the production process for the preparation of high-quality graphene and graphite on a large scale from graphite as a value addition to local graphite was developed. A wastewater treatment system for the purification of wastewater discharge from the graphene production process was designed. During the reviewed year, manganese removal through chemical neutralization followed by sedimentation has already been developed but is less economical since a huge quantity of chemicals is required ending up with a chemical sludge. Thus, the continuation of laboratory trials for further investigation of more feasible technology is in progress.

Research and Development of the Kithul

Further research and development activities to develop the Kithul industry were initiated with financial support from the State Ministry of Coconut, Kithul, and Palmyrah Cultivation Promotion and related Industrial Products.

A collaborative study was initiated with Sabaragamuwa University to address the severe leaf damage to the Kithul trees in the Erathna area and Galle district. The pathogen was identified and research is in progress on control measures. It was recommended to apply powdered sulphur to

young trees and plants in the nurseries to control the spread of the pathogen as a temporary control measure.

Scientific methods to identify the adulterated Coconut, Palmyra and Kithul toddies were initiated. A method using HPLC was developed to differentiate the volatile and organic compounds in natural and adulterated toddies. Further scientific validation of the method is in progress.

An efficient, cost-effective method was used to extract fiber from Kithul leaf sheath and leaflets by chemical and mechanical methods. The properties and application of fibers are under investigation. The establishment of certified Kithul plant nurseries in major Kithul growing areas and the identification of the carbohydrate composition of Kithul flour are also in progress.

4.2.2 Technology ready for transfer

Fish-based liquid fertilizer

ITI has developed a novel process technology to manufacture organic liquified fertilizer from fish by-products as an effective approach to the prevailing national issue of the chemical fertilizer ban. It can be utilized as a nitrogen-rich source for crop application after field testing is completed.

Nas Narang sports drink

Nas Narang (*Citrus madurensis*) is a fruit with good nutritious value. It has a high content of minerals and vitamins and high antioxidant properties. Sports drinks developed using Nas Narang are a good source to replace the water, salt and sugar lost during sports.

Low-cost graphite-based composite electrode for electrochemical applications at high-temperature

Graphite-based electrodes fabricated using organic binders fail to withstand high temperatures due to the instability of the binders. Therefore, the majority of existing graphite-based electrodes are restricted only to low-temperature electrochemical applications. The graphite electrodes for high-temperature applications are currently fabricated using expensive binders and materials that eventually make the final product (electrode) very expensive. A stable and low-cost graphite-clay composite electrode with enhanced electrical and mechanical properties for electrochemical applications at high-temperature was invented and the technology is ready to transfer.

Lubricant products from local graphite

With the unique property of graphite layers sliding on top of each other with little resistance, graphite-based lubricants are used widely in many applications, especially in mechanical equipment. Graphite lubricants with different compositions developed using graphite, graphite oxide and graphene on large scale showed good lubricant properties. These lubricant products were developed to use as a dry lubricant at high temperatures and the technologies are ready to transfer.

Technology for upgrading and purifying graphite

Graphite is a well-known remarkably versatile industrial material which is predominantly used in conventional steel, refractory and lubricant products. It has a high potential to be utilized in high-end nanotechnological applications. The type of graphite found in Sri Lanka is high-grade vein graphite with a high carbon content above 95% and with the least amount of impurities and therefore an ideal source for the aforesaid value-added products. It is exported with minute value addition, for which purity mechanical purification and powdering are currently being practised. Graphite of above 99% is several times more expensive than raw graphite. The material Technology Section has developed technologies to upgrade low-grade graphite below 70% to above 99% using the physical method and the technology to purify graphite to a level of above 99.9% using the chemical method. The technologies are ready to transfer.

Bamboo charcoal

The high sugar content of some Sri Lankan bamboo varieties restricts the use of bamboo in industries. With the aim of giving value addition to these varieties, a technology was developed to produce bamboo charcoal on a laboratory/domestic scale and is ready for technology transfer.

4.3 Developments in Technical Services

During the review year, new testing services were established, expanding the scope of ITI to assist the local industry and export industries and support COVID-19-related product testing. An uninterrupted service on chemical, microbiological, material, metrology, food, herbal, pharmaceuticals, petroleum and lubricants, air quality, noise and vibration and metal and chemical residue testing was provided for clients including tea and spice exporters, alcohol manufacturers and importers. More than 50 Nos. of new innovative products were tested and evaluated at the request of the Sri Lanka Invention Commission and MSMEs.

4.3.1 New Services

Accreditation scope expansions

The Microbiological Laboratory of CML obtained accreditation for 08 matrices and 11 parameters, including hand sanitizers, hand wash, disinfectants, medical devices and health care products (face mask, gloves), canned food, ice cream, yoghurt, cosmetics and water (new standard). At present Microbiological Laboratory is accredited for 29 matrices which cover 94 parameters. The Inorganic Laboratory of CML obtained accreditation for six anionic parameters in water using the Ion Chromatography technique, while the wastewater laboratory obtained accreditation for dissolved phosphates in water and wastewater.

Manufacturing process line verification and validation for refining of coconut oil

Food Technology Section started validating the coconut oil refineries in Sri Lanka as a request made by the Coconut Development Authority to address the quality issues raised during the past few years in the country. Process validation was started with a facility survey for three major refined oil producers in Sri Lanka.

Acoustic design for the proposed auditorium at Kotalawala Defense University

The Central Engineering Consultation Bureau (CECB) assigned ITI the acoustic design of the proposed multipurpose auditorium to Sir John Kotalawala Defense University. The Electro Technology Laboratory (ETL) initiated this project for the first time in this nature using the design and simulation facilities at the laboratory in collaboration with CECB. The work involved structural designing and identification of material for acoustic treatment satisfying the architectural requirements of the client.

Analysis of polychlorinated biphenyls

Polychlorinated biphenyls (PCBs) classified under persistent organic pollutants (POPs) are a group I carcinogens. Sri Lanka is a signatory of the Stockholm Convention, where PCB usage is curtailed since 2005. The elimination of PCBs by 2025 is a primary goal set by the convention. The seven PCBs (PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180) known as “indicator PCBs” are used to characterize the presence of PCB contamination. The analysis of indicator PCBs in soil and sediments by Gas Chromatography-Electron Capture Detection (GC-ECD) was initiated during the reviewed year.

4. 4 Infrastructure Development

Establishment of Packaging Testing Laboratory

Under the EU Sri Lanka Trade-related assistant project, the UNIDO has identified the Materials Laboratory of ITI as the most suitable laboratory to provide technical support to establish a packaging material testing laboratory in Sri Lanka. The required instruments and training for the packaging testing laboratory were granted by UNIDO. The services related to packaging materials are undertaken by the newly established laboratory.

4.5 Contributions to National Issues

Analysis of heavy metals and microplastics in sediments and seawater

Sri Lanka’s worst-ever marine disaster occurred when a fire erupted on the MV X-Press Pearl, a Singapore-registered container ship on the western coast of Sri Lanka on 20 May 2021. The ship loaded with 1486 containers including nitric acid, fuel oil and plastic pellets, sank after several days of burning. The ITI was assigned to carry out the analysis of heavy metals and microplastics

in sediment and seawater samples submitted by the Marine Environment Protection Authority as an immediate service, to investigate the damage caused by the disaster.

Aflatoxin and microbiological testing in coconut oil

In March, consumers in many parts of the country were alarmed by a report on the detection of aflatoxins in coconut oil and ITI was requested to carry out the analysis for the presence of aflatoxins in imported edible oils by the Consumer Affairs Authority. The CML and Residue Analysis Laboratory, since then, continues to analyze the samples submitted by oil exporters and oil refinery industries.

Testing of arsenic in canned fish

A consignment of imported canned fish containing arsenic was reported and ITI was requested by the Consumer Affairs Authority and Sri Lanka Standards Institute to analyse the samples of canned fish to check the presence of arsenic. The total arsenic concentration was determined by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The results were verified with SLS 591-2014 standard and the report was submitted to the requested authorities. ITI continues testing all imported canned fish for the presence of heavy metals and with the ITI report, the importers are to get their consignment of canned fish cleared from Sri Lanka customs.

Testing of organic fertilizer

The ban on chemical fertilizers imposed in April 2021 as an agricultural policy had a major impact on expanding the organic fertilizer manufacturing sector in Sri Lanka. As a result, there was a sudden increase in the manufacturing of organic fertilizers and high demand for testing services. The CML immediately established the required testing facility to analyze the organic fertilizers as per SLSI and international standards and issued reports continuously. Moreover, analyses were undertaken on the organic and inorganic fertilizer samples received through the National Fertilizer Secretariat throughout the year.

Ensuring quality and authenticity of toilet soaps

Total Fatty Matter content in different types of soap categories such as toilet soap, bathing bars and baby soap marketed in Sri Lanka was a high concern among consumers, the cosmetic industry, Consumer Affairs Authority and regulatory bodies. Hence, considering consumer safety and authenticity, the Consumer Affairs Authority was requested to analyze the soap samples collected from local markets for Total Fatty Matter content. The market sampling was done by the Sri Lanka Consumer Affairs Authority and the results revealed quality concerns in some soap brands.

Quality report on soap

As a requirement of the government during the COVID-19 pandemic lockdown, free food and personal care items were delivered to households by the government through Lanka Sathosa. These soap samples included in this package were sent by Lanka Sathosa to ITI for analysis and issued quality reports before being delivered to people. The officers from the cosmetics laboratory were involved in the analysis of soap and issued test reports continuously during this period.

Detection of harmful alcohols in sanitizers

The demand for hand sanitizers and disinfectants was continuing since 2020 due to the COVID-19 pandemic. As many entrepreneurs and new startups started manufacturing hand sanitizers, the safety and quality of products became highly critical. Hence, regarding personal safety, the Consumer Affairs Authority requested ITI to analyze the generally specified alcohol grades (isopropyl alcohol and ethanol), other types of harmful alcohols (methanol) and the presence of lower grades of alcohol in hand sanitizers and disinfectants. With a modified test method using the GC/FID technique, the four types of alcohols (ethanol, isopropyl alcohol, methanol and n-butanol) were simultaneously analyzed. The reports were sent to the Consumer Affairs Authority.

Testing of LPG regulators and hoses

The explosions and gas leak accidents in domestic and industrial LPG gas cylinders have created fear and unrest among society throughout the country. A large number of incidents were reported concerning leaking domestic and industrial LPG gas cylinders. The change in the composition of butane, propane and ethyl mercaptan (odorant) of LPG gases, and the quality of gas regulators and hoses were some of the major reasons for this gas explosion incidences. ITI officers from Petroleum and Lubricant Testing Laboratory participated in the sampling of LPG from cargo vessels with the other technical experts from SLSI, SLAB and Consumer Authority. Further ITI technical experts attended all observation visits to Laugfs Gas Plc, Litro Gas and their private laboratories and meetings with the Presidential Secretariat, Consumer Authority, the Ministry of Technology and the University of Moratuwa and represented in expert and advisory committees throughout this period.

Even though the Sri Lanka Standards for LPG regulators and hoses were in place, there has not been a necessity to test for compliance of the accessories available in the market with the standard. With the recent calamity, the government and relevant authorities needed to test for the specification and ITI stepped forward to establish the test facilities for LPG regulators and hoses. Further ITI higher officers represented all committees of government and regulatory authorities and provided expert knowledge in addressing and solving this issue and further developing a Sri Lanka Standard for LPG sampling and analysis.

Rural community/MSME development and women empowerment programme

ITI provided technical support to address the fungal contamination successfully on palm leaf-based handicrafts done by a rural community in the Hambantota area to uplift the rural industry. ITI introduced a safe chemical solution to extend the storage life of palm leaf-based handicrafts targeted at the export market. This was undertaken with the financial assistance of the Vidatha programme.

4.6 Contributions to National Projects

Initial Environmental Examination (IEE) for the proposed Sri Lanka Institute of Biotechnology innovation park

The Sri Lanka Institute of Biotechnology (SLIBTEC) innovation park is to be established under the Ministry of Technology at Aramawatte, Pitipana, Homagama. to promote research and innovations in the Biotechnology sector. As an initial requirement, the IEE was conducted by ITI under the contract agreement with the SLIBTEC on request by Central Environmental Authority (CEA). Approval for the proposed project was granted by the CEA based on the IEE report recommendations.

Environment Impact Assessment studies

Environment Technology Section was undertaken several Environment Impact Assessment (EIA) studies for national development projects. During the reviewed year an air quality impact assessment for the proposed Welikada prison relocation project at Millewa, Horana, a BOOT basis-air quality impact assessment study and an air dispersion modelling study on 350 MW RLNG/diesel operable combined cycle power plant at Kerawalapitiya and EIA studies with respect to air quality, water quality and noise and vibration for the proposed elevated highway from Rajagiriya-Athurugiriya were carried out. ITI also contributed to the hazardous waste management study of the proposed pharmaceutical manufacturing zone at Arabokka.

Ambient air quality and discharged water quality monitoring of Bandaranaike international airport development project

According to the environmental management plan of the Bandaranaike international airport development project phase II stage 2, package B—construction of remote apron and taxiways, project monitoring the status of ambient air quality and the discharge of water is a key requirement to take control of measures to maintain environmental quality. The ambient air quality monitoring was conducted according to the national environmental (ambient air quality) regulations.

Water quality analysis of discharge water from the construction sites was conducted to establish treatment systems if necessary, according to the environmental guidelines. In addition, the water quality analysis of groundwater was also conducted to test for any contaminants due to this project.

These analyses were carried out every quarter at selected locations followed by site (location) selection guidelines during the construction period in 2021.

Baseline data collection and analysis on ambient air quality for Environmental Impact Assessment studies

The central expressway development project phase III, the industrial zone under Hambanthota international port development project and the Kantale sugar factory rehabilitation project are some of the major national projects undertaken by ITI. The ITI was assigned for the baseline data collection analysis on ambient air quality for EIA and conducted measurements at selected locations close to the vicinities of the project sites.

Noise barrier installation inspection central expressway section 2

The identification of noise-sensitive locations and design of noise barriers for the sensitive locations of the central expressway section 2 project was completed by ITI in 2018 in parallel to the construction work of the road. The procurement of the noise barrier and implementation was done by RDA, with the expertise of ETL staff, to evaluate the technical requirements of the bids. The installation of the noise barriers in the central expressway (CEP) section 2 project was completed in 2021.

The officers from ITI inspected the quality of the noise barriers and the installation workmanship of the noise barriers and completed the first project on noise barrier location identification and barrier design, implementation and commissioning which was undertaken by ETL in 2021.

Monitoring of Polychlorinated Biphenyls contamination in Sri Lanka

Intending to identify the disposal of Polychlorinated Biphenyls (PCB) contaminated sources in Sri Lanka in the effort to phase out PCB-contaminated sources by the year 2025 from the country, the ITI continued the analysis of transformer oil for PCB. During the reviewed year, more than 330 transformer oil samples were collected and analyzed under the project on environmentally sound management and disposal of wastes (PCBs) and PCB-contaminated equipment in Sri Lanka in collaboration with the Ministry of Mahaweli Development and Environment.

4.7 Technology for human welfare and socio-economic upliftment

Development of nutritious and healthy food corners for children and adolescents

Junk foods with low nutritional value and unhealthy ingredients are popular among children and adolescents. These foods are identified as one of the leading causes of increasing Non-Communicable Diseases (NCD) among the younger generation. Ensuring children and adolescents access safe, healthy and nutritious food is one of the key areas of the nutrition policy in Sri Lanka. With this concept, the project was initiated to develop a range of nutritional and healthy food products by utilizing local raw materials for children and adolescents. Two surveys on food consumption patterns and preferences of children and adolescents and consumer perception and

purchasing behaviour towards ready-to-eat food among students and parents in the Colombo district were conducted.

Instant convenient nutritious mid-day meal packages including instant rice with green gram flakes, retorted curry mix, processed dehydrated vegetables with either fish, meat or vegetable and a Multigrain bun incorporating chickpea flour were developed. Evaluation of the physicochemical properties of the products is in progress.

Development of a database on nutritional, chemical, molecular and morphological characteristics of selected traditional and widely consume rice varieties of Sri Lanka

There are many traditional and more than 60 new improved rice varieties available in the country. However, only limited studies have been conducted in the country on the nutritional, chemical, molecular and morphological characteristics of these rice varieties. A project was initiated to develop a database on nutritional, chemical, molecular and morphological characteristics of selected traditional and widely consuming improved rice varieties of Sri Lanka. During the reviewed year, initiated the development and validation of a method for tocopherol and tocotrienol analysis in rice. Parameters of repeatability, Limit of detection (LOD), Limit of Quantification (LOQ) and linearity were determined. Under the evaluation of seed chemical characteristics, NaOH, KOH, phenol and modified phenol tests were carried out for whole grains of 10 traditional rice varieties. Further, NaOH and KOH tests were carried out for 08 new improved rice varieties.

Anti-Nutritional Factors (ANFs) and bioactivity of proteins in locally grown edible legume varieties

Legumes are a valuable source of dietary proteins, carbohydrates, and fiber and an important source of essential vitamins and minerals. The nutritional and functional characteristics of legumes have been associated with a reduction in the incidence of various cancers, HDL cholesterol, type-2 diabetes and heart disease. A study to identify Anti-Nutritional Factors (ANFs) and the bioactivity of compounds in commonly grown local edible legumes in Sri Lanka was initiated. Data compilation and statistical analysis of enzyme inhibitory activities (trypsin and alpha-amylase) in legume varieties were carried out.

Value-added products from selected underutilized fruits

Preparation of beverages from these underutilized fruits using advanced technology of pasteurization followed by hot filling to minimize the destruction of bioactive components and nutrients and to retain the quality of the product was initiated. During the reviewed year fresh and vacuumed dried fruit powders of ambarella, sour-sop and veralu were prepared and those showed good anti-oxidant properties. An ambarella powder incorporated with instant soup and sour-sop powder incorporated with drinking yogurt was developed. Further, vacuum-dried veralu powder, veralu smoothies, veralu incorporated pudding and isotonic Nas Narang sports drink were developed.

Development of milk and grain functional beverages and food supplements

Although there is high demand for healthier and natural foods made from whole grains, still the market is not established to meet the demand. Most of the products formulated from whole grain are less popular due to the coarseness and sensory factors of the products. Addressing the above, milk and grain functional beverages and supplements were developed. Those products provide the consumers with both probiotics and prebiotics including phytochemicals, dietary fiber, proteins, minerals, vitamins, and other bioactive components in whole-cereal grains.

4.8 New Initiatives

Traceability study of organic residual contaminants in dairy supply chain, risks and opportunity assessment and expanding dairy product testing facilities

The objective of this study was to develop and validate detection methods of chemical residues (antibiotics, pesticides and aflatoxin) present in bovine milk and to formulate a long-term sustainable strategy to minimize and eliminate the residue of chemical contaminants in the milk supply chain.

Vegetarian food products containing non-synthetic additives processed using less preferred local vegetables

The objective of this study was to improve the consumption of less preferred and utilized local vegetables through the technological development of new and attractive formulations of such commodities.

Utilization of selected underutilized and popular root tuber crops grown in Sri Lanka to formulate healthy and novel food products and food ingredients aiming the local and international markets

The objective of this study was to conduct starch characterization and analysis of nutritional and functional properties of selected traditional root tuber crop varieties grown in the country and to develop healthy and novel easy to consume food products.

Establishment of inactivation kinetics for potentially harmful microorganisms associated with thermal processing of king coconut water and coconut milk

The objective of this study was to identify harmful microorganisms associated with the thermal processing of coconut milk and to study the changes in inactivation kinetics of identified microorganisms with different compositions of coconut milk.

Development of novel juice extraction techniques for high-quality extracts from underutilized agro-based commodities and fermented and powder products

The objective of this study was to select juice extraction technologies with minimum mechanical damages and crude contaminations by comparing advanced technologies, indigenous technologies and conceptual methods development with food microbiology, verify methods of fruits, vegetable, and herbal juice extraction, direct inactivation of pathogens and novel product development using underutilized agro-based commodities and formulation of a range of products including juices, concentrated juices, pulp, smoothies, paste and powdered products.

Formulating vegan meat analogues and plant-based meat products using plant proteins and mycoproteins

The objective of this study was to develop plant-based vegan meat products and meat analogues using plant proteins and other plant commodities such as jak and mushrooms and mycoproteins derived from the fungus *Fusarium venenatum*.

Establishment of taxonomic status, nutrition labelling systems and development of value-added products from Sri Lankan citrus varieties

The objective of this study was to identify existing underutilized citrus species and the conservation of citrus species through classical taxonomic and chemotaxonomic characterization and screening of citrus species for superior quality bioactive compounds and nutritional composition.

Development of user-friendly, non-destructive high tech, portable IT device to authenticate and geotag Sri Lankan bee honey

The objective of this study was to develop a non-destructive, user-friendly, high-tech IR technology to detect adulteration of bee honey and to establish a geotagging system.

Modification of red clay-based water filter to suppress harmful bacteria

The objective of this study was to improve the antibacterial activity of the red clay filter while preserving the arsenic, cadmium, and fluoride removal ability of the clay water filter.

Further development of red clay-based superior-quality cookware

The objective of this study was to develop a marketable superior quality, attractive, cookware tolerable to high thermal shocks using suitable clay sources targeting local and international niche markets.

Preparation of composite membrane for reverse osmosis plant

The objective of this study was to develop materials for reverse osmosis (RO) membrane, primary filter cartridge used in the pretreatment process for separation of particles such as sand, and dirt and develop materials for carbon filters used in the pretreatment process of RO plants.

Designing and fabrication of a water ionizer

The objective of this study was to fabricate and implement a low-cost, water-ionizing system to minimize cross-contamination of bacteria and viruses especially Coronavirus during the new normal life.

Demand-driven automotive rechargeable cost-efficient battery manufacturing technology for SME startups

The objective of this study was to introduce high-quality battery manufacturing technology to the local industry by creating a cost-efficient product to influence the reduction of existing price scales.

Development of in-house PCR based method for detection of plant-based adulterants in Sri Lankan spice Turmeric (*Curcuma Longa*) and Tea (*Camellia sinensis* L. Krunztz)

The objective of this study was to develop molecular-based detection methods for adulterants in turmeric and tea which are affecting the economy and the well-being of people.

Determination of microplastic contamination of edible salts in the Sri Lankan market and identification and quantification of the heavy metals

The objective of this study was to qualitative and quantitative assessment of microplastics in edible salts in the Sri Lankan market.

Development of a calibration system for measuring tape using an optical interferometer

The objective of this study was to extend the scope in dimension area and to develop a suitable calibration method without consuming space in the laboratory.

Develop calibration system for Infra-Red thermometers

The objective of this study was to increase the reliability and accuracy of medical IR thermometers.

4.9 Collaborations

ITI continued its long-standing international collaborations and joint programs with the Commission on Science & Technology for Sustainable Development in the South (COMSATS), the World Association of Industrial and Technological Research Organization (WAITRO), the

International Bamboo & Rattan Organization (INBAR), United Nations Industrial Development Organization (UNIDO), Food and Agriculture Organization of the United Nations (FAO), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), United Nations Development Programme (UNDP), Ministry of Science and Technology of China, International Center for Chemical Biological Sciences, University of Karachi, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the University of Toledo, USA.

An international corporation with COMSATS Center of Excellence

ITI signed MOU with the International Center for Chemical and Biological Sciences (ICCBS), the University of Karachi and the COMSATS University Islamabad (CUI) in Pakistan. The Director General of ITI, Dr Radhika Samarasekera represented ITI while the Pakistani High Commissioner to Sri Lanka, Major General Muhammad Saad Khattak represented Pakistan and was signed in the presence of the Prime Minister of Sri Lanka, Hon. Mahinda Rajapaksa and Prime Minister of Pakistan Hon. Imran Khan on 23rd February 2021 at Temple Trees.

The Memorandum of Understanding with the ICCBS will enable academic and research collaborations in the fields of Medicinal Plants and Natural Products Chemistry, Food Technology, Biotechnology, Nanotechnology, Tropical Disease Research, Biomedical Sciences and Analytical and Clinical Testing Services. The frameworks of cooperation are also identified as joint activities including short-term and long-term academic programs, visiting expert research exchange programs, joint postdoctoral and postgraduate training, joint short-term training, publishing joint research journals and publications and scholarly materials and conducting joint conferences, workshops and seminars, facilitating sharing and use of scientific resources and facilitating to find grants to establish analytical services laboratories.

The Intent of Cooperation signed between CUI and ITI would focus on joint academic and research activities including short-term and long-term academic programs, publishing joint research journals and publications and scholarly materials and visits and exchange of researchers, staff and faculty members, joint training programs, conferences and seminars, facilitating sharing and use of scientific resources.

The following research and technical service collaborations are currently in progress;

- Mutual Non-Disclosure and Confidentiality Agreement with Camso Loadstar (Private) Limited to undertake ISO 17025:2017 consultancy service.
- Joint research in partnership with Center for Technical Excellence in Ceramics (Guarantee) Limited (CENTEC) for the development of new ceramic products and processes and technical support for the ceramic industry.
- Agreement with Central Engineering Consultancy Bureau for providing sub-consultancy services for the designing, testing and commissioning works of an architectural acoustic system for the proposed auditorium at General Sir John Kothalawala Defence University.
- Corporate client agreement with Colombo Dockyard PLC to provide testing services.

- Agreement with the State Ministry of Coconut, Kithul and Palmyrah Cultivation Promotion and related Industrial Product Manufacturing & Export Diversification to conduct research and development activities for the development of the Kithul industry for the year 2021.
- MoU with the Sri Lanka Institute of Biotechnology (Private) Limited to provide consultancy services to conduct the initial environmental examination of the proposed Sri Lanka Biotechnology Innovation Park at Pitipana.
- Agreement with Sri Lanka State Trading (General) Corporation Limited (STC) appointing STC as the exclusive distributor agent to supply “SYLANI” hand sanitizer to the Sri Lankan market.
- Collaboration with the Smallholder Agribusiness Partnerships Programme (SAPP) implemented by the Ministry of Agriculture for technology intervention for turmeric and ground nut value chain development.
- MOU with the Palmyrah Research Institute for R&D and technical services collaborations.
- MOU with the Eastern Province Council for establishing a collaborative state-of-the-art organic product testing laboratory in Kantale.
- MOU with Business Management School (BMS) to conduct internships, practical courses and research programmes in Biotechnology for undergraduates.

CHAPTER 5: MONITORING AND MITIGATING POLLUTION

ITI has conducted more than 225 services in various disciplines of environmental management and Technology during the reviewed year. These services mainly include design, development and performance assessments of air pollution control and mitigation systems, design and performance assessment of wastewater treatment plants, solid and hazardous waste management, ventilation management, water quality studies, flue gas analysis, performance assessment of incinerators, environmental risk assessments, monitoring & survey including indoor and outdoor air quality, Environmental Impact Assessment (EIA) studies and Initial Environmental Examinations (IEE).

5.1 Wastewater treatment

ITI provides demonstrations on the treatment of wastewater and consultancy on the implementation process of wastewater treatment plants. During the review year, demonstrations and consultancies were offered to construct and upgrade wastewater treatment plants in industries, hotels and hospitals.

Implementation of the wastewater treatment plant at Waters Edge (Pvt) Ltd

Technical expertise for the implementation of the wastewater treatment plant at Waters Edge (Pvt) Ltd. was provided by Environmental Technology Section (ETS). The work included guidance for the preparation of the technical part of the bid document in the tender calling process, bid evaluation, preparation of bid evaluation criteria/marketing scheme, evaluation of proposals submitted by bidders for implementation of the wastewater treatment plant, supervision of treatment plant construction and commissioning process. Further, the certification of the implemented project (before handing over), verification of the compliance of the implemented project with the preset criteria of plant design, construction, equipment and machinery installed, commissioning and plant performance with proof of quality compliance of purified wastewater at final discharge were also conducted.

5.2 Air pollution control

Environment monitoring of the Norochcholai coal power plant

Under the activities, the direction given by the Supreme Court to the Public Utility Commission Sri Lanka, the ITI was selected as the expert institution to measure the impact on the environment on the activity of the Norochcholai coal power plant. Accordingly, air quality, stack emissions and discharged water quality are measured every quarter. These monitoring data were utilized to evaluate the efficiency of the emission control measures incorporated with three power generation units. Considering the national importance, the air quality of 12 locations, including the Sri Maha Bodhi area and Wilpatattu national wildlife park were measured quarterly to assess any impact from the coal power plant.

Emission measurements at SIAM CITY Cement Lanka Ltd.

The ITI was requested to conduct the comprehensive emission measurement programme for the chimneys of Siam City Cement Lanka Ltd according to USEPA-approved methods with the internationally accepted protocol for cement plant emission monitoring. These measurements and analyses have been carried out at foreign laboratories till 2021 and this was the first time such an analysis was carried out in Sri Lanka. The data is utilized to calibrate the continuous emission monitoring equipment installed in the factory and for comparative analysis among their group of factories worldwide. The dioxins and furans were analyzed in collaboration with foreign laboratories as ITI does not have the facility to analyze dioxins and furans.

Feasibility study of mitigation of odour generated during tobacco processing

An investigation was carried out for the first time in Sri Lanka to identify the odour-causing chemicals emitted during tobacco processing on a request by Ceylon Tobacco Company PLC, Kandy. Based on laboratory analysis ITI provided a detailed design for modifications of the air pollution control system to mitigate the present odour at the premises.

Technical guidance on controlling the air pollution

The adequacy of the air pollution control system installed at Access Engineering PLC was assessed and provided technical guidance for controlling the dust emanating from the operational activities of the asphalt plant at Horawala, Mathugama.

5.3 Noise mitigation

Noise generated from various sources and activities pollutes the environment leading to various health hazards and disturbances. According to environmental regulations, solutions have to be taken by the industries to prevent environmental issues of noise and vibration. ITI with its expertise and equipment facility offers its services to noise mitigation, especially to industries.

Testing of noise emission from firecrackers

Lighting firecrackers during the festive season is a common activity in South Asian countries. Due to the non-availability of regulations or standards for the production of firecrackers, some of the firecrackers available in the market generate very high noise levels when burning. These noise levels are inconvenient for residential people as well as for animals. The noise levels emitted were investigated while burning crackers, in a field test done by burning several types of firecrackers at the Panalywa range, belonging to the Sri Lanka Army. It was observed that some firecrackers generate more than 100dB of sound which, is unsuitable for the human ear.

Noise mitigation design of DSI Rathupaswala

The DSI factory located in Rathupaswela engaged in producing tyres for the local market has machinery at multiple locations of the factory. The measurement conducted by ITI observed some sensitive receptors exceed the regulatory noise levels. The high noise-generating machinery and areas were identified and noise mitigation solutions were proposed.

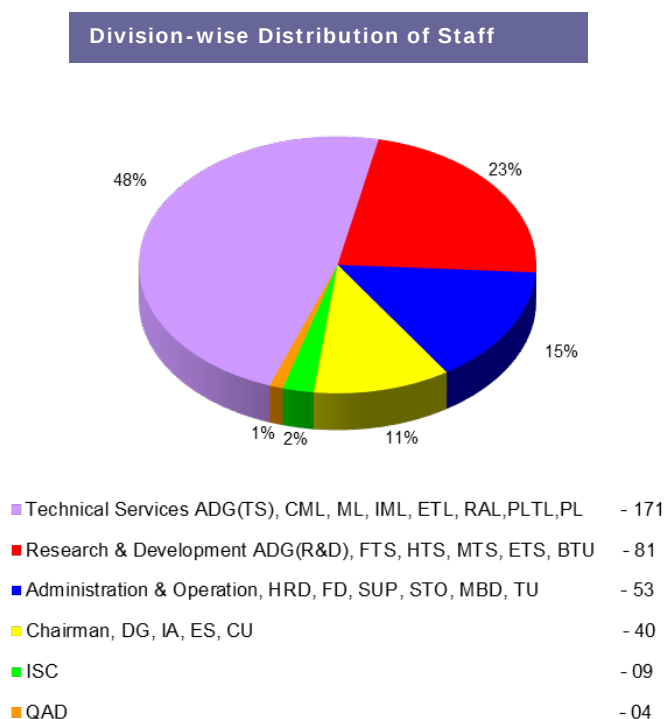
Noise mitigation solution for Tokyo super batching plant

The noise levels generated by the Tokyo super batching plant located in Werellagama, Adeniya during the night disturb the residents of the vicinity. As for the complaints raised by the residents, Central Environmental Authority jointly with ITI conducted noise measurements and a mitigation proposal was submitted to the company.

CHAPTER 6 – SUSTAINABLE DEVELOPMENT

6.1 Employment Statistics

The ITI recruited 45 employees during the year thus the total permanent staff of the institute is now 358. The total permanent staff is 171 (48%) in Technical Service Division, 81 (23%) in Research and Development Division and 53 (15%) in Administration and Operation Division. Other sections such as the Chairman's office, Director General's office, Internal Audit, Engineering Service Department, Computer Unit, Information Services Centre and Quality Assurance Department comprise 53 (14%) of permanent staff. The Chemical and Microbiological Laboratory is the largest section of the Institute with 52 (14.5%) of the total staff. Employment statistics are presented in the following pie chart.

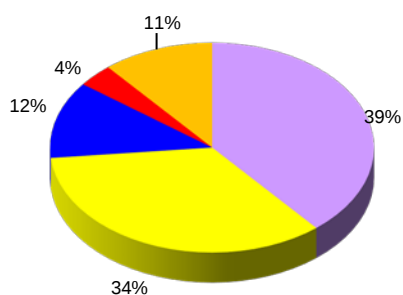


Distribution of staff

Technical Division comprised 98 Technical Staff, 87 Research Staff, 30 Administrative and Management Assistants and 28 other staff and 09 Senior Managers.

Support Division comprised 40 Administrative and Management Assistants, 18 Primary Level staff, 16 Technical Staff, 04 Research Staff, 18 Craftsmen and 10 Senior Managers. The distribution of staff is presented in the following pie charts.

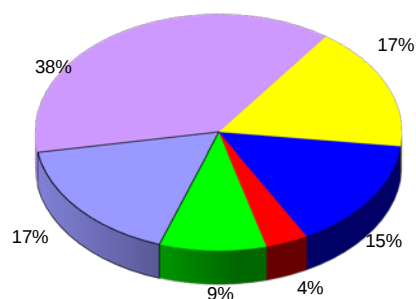
**Category-wise distribution of Staff
Technical Divisions**



■ Technical
■ Research
■ Administrative & Clerical
■ Management
■ Others (Aides, Helpers)

- 98
 - 87
 - 30
 - 09
 - 28

**Category-wise distribution of Staff
Support Divisions**

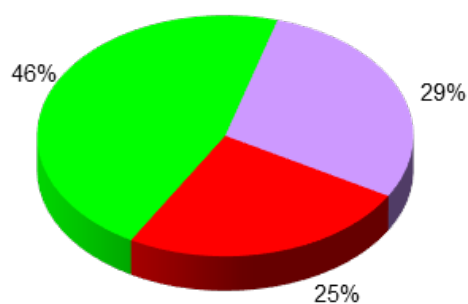


■ Administrative & Clerical - 40
■ Others (Drivers, Helpers) - 18
■ Technical - 16
■ Research - 04
■ Management - 10
■ Craftsmen (Skilled and Semi skilled) - 18

Research staff

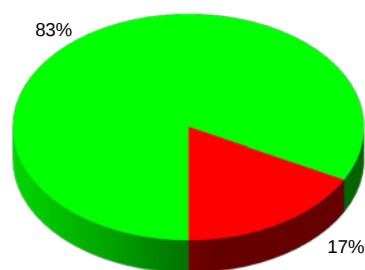
The research staff comprised 86 Scientists and 18 Engineers at the Institute. Among the Research staff, 26 are qualified with Ph.Ds. and 30 are with MSc/MPhil/PG Diplomas. The educational background of the Research staff is presented in the following pie charts.

Research Staff - Educational Background



■ Bachelor's degree - 48
■ MSc/MPhil/PG Diploma - 30
■ Doctoral degree - 26

Research Staff - Scientists / Engineers



■ Scientists - 86
■ Engineers - 18

The expertise of the research staff

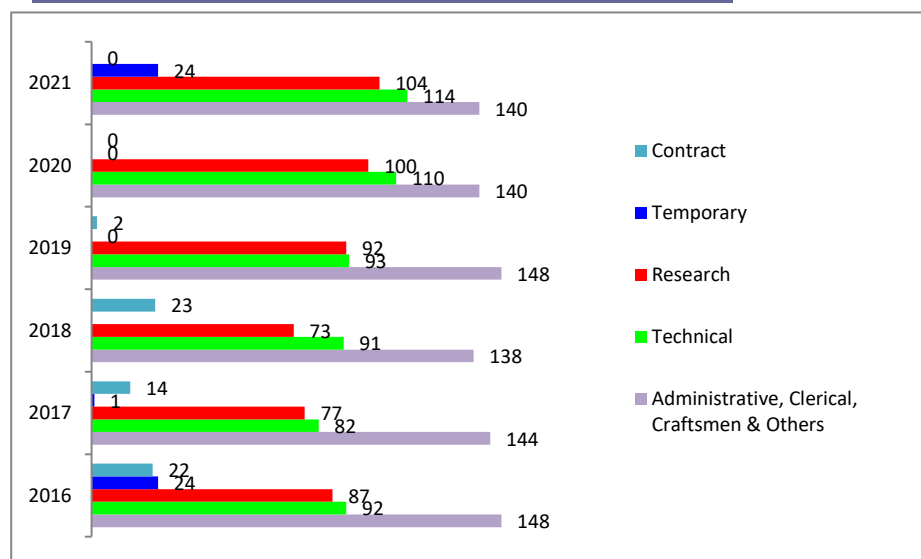
The Research and Development Division of the Institute comprises five sections, Food Technology, Herbal Technology, Materials Technology, Environment Technology and Biotechnology. The research staff carry out Research and Development and Innovations in their fields of expertise on demand-driven, national-importance high-tech research in multidisciplinary fields through state-of-art R&D laboratories at Modern Research and Development Complex, Malabe and Colombo facility. The research staff of the Research & Development Division provides solution-focused innovations and engages in activities connected with technology transfer, the adaptation of technologies and the development of new technologies for industrial promotion and Entrepreneurship development targeting the Micro, Small, and Medium Entrepreneurs (MSME), Startups, Women Enterprises and Small Businesses. The research staff is involved in providing technology to enhance Export Industry and for import alternatives and domestic value addition. In the Environmental Technology area, our strength lies in industrial pollution control and environmental monitoring including noise and vibration monitoring. The research staff also has expertise in Information Management and Quality Management Systems.

The Technical Services Division of ITI has become the pioneer in laboratory testing and calibration services expanding its scope of accreditation and ensuring the accuracy, precision and international acceptability of its test reports and services. This facility has high-end analytical testing and modern monitoring equipment and air quality and stack monitoring mobile laboratory to support the rapid industrialization of the country. ITI is the authorized testing laboratory for industries, exporters, government organizations and local and international regulatory authorities.

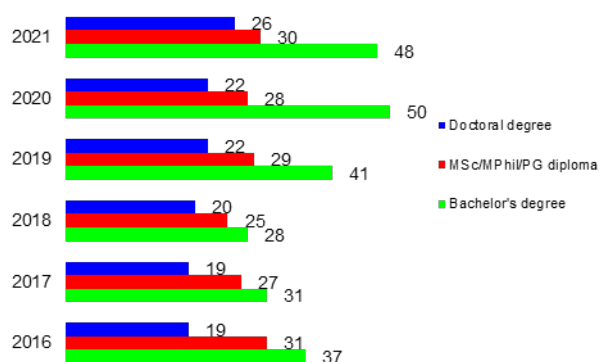
Trend analysis

A total of 45 staff were recruited during the reviewed year. The total permanent staff of the institute increased to 358 against the 439 approved cadre. During this period the percentage of research staff and technical grade staff showed a slight increase. The administrative, clerical, craftsmen and other positions remained constant. The staff with PhD and post-graduate qualifications showed a marked increase from 2016 to 2021. The ratio of Research Scientists to Research Engineers remained constant at 1:5.

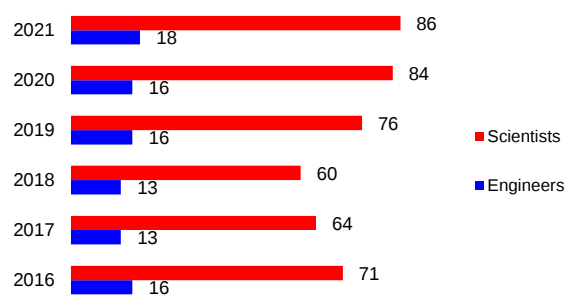
Category wise distribution of Staff 2016- 2021



Educational Background of Research Staff



Scientist/Engineers ratio 2016-2020



6.2 Quality Assurance

Enhancing the quality infrastructure of ITI

The Laboratory Quality Management System ISO/IEC 17025:2017 was maintained by the five technical services laboratories, Chemical and Microbiological Laboratory, Industrial Metrology Laboratory, Residue Analysis Laboratory, Material Laboratory and Electro Technology Laboratory by conducting internal and external audits. Accreditation for more than 700 parameters was obtained by the Sri Lanka Accreditation Board (SLAB) for chemical, food, water, cosmetics, material, microbiological, residue chemical testing, industrial noise and vibration measurements and calibration.

The newly established Pharmaceutical Laboratory, Packaging Laboratory, and Petroleum and Lubricant Laboratory are in the progress of implementing of ISO 17025:2017 Laboratory Quality Management System. The Herbal Technology Section and Biotechnology Section of the Research and Development Division which are currently certified for ISO 9001:2015 Quality Management System are in a process of implementing ISO 17025:2017 Laboratory Quality Management System for essential oils and GMO testing during the reviewed year.

Research and Development Sections and Information Service Centre continued to maintain ISO 9001:2015 Quality Management System Certification.

Measurement traceability

Measurement Traceability, Mass, dimensions, volume, electrical, and temperature measurements are accredited and traceable to SI units through PTB - Germany, NMIT - Thailand, NIST - USA, Danak Denmark, NTPL and KRISS - South Korea. Performance tests on selected lab apparatus, force and pressure measurements are traceable to SI units through KRISS – South Korea, NMIT Thailand, DKD Germany and NIST USA.

ISO/IEC 17043: 2010 Accreditation for Proficiency Testing

As the first Sri Lankan Proficiency Testing (PT) provider conducted 3 Proficiency Testing programs in water and food and maintained accreditation status according to ISO 17043: 2010.

6.3 Information Services

The Information Services Centre (ISC) continued to maintain and increase its wide range of resources that includes over 22250 books, standards, over 100,000 reprints, and other miscellaneous publications. The subscription to the well-used Science Direct database had to be discontinued due to restrictions on government grants. The centre collected more e-books and e-publications and access was made available to staff through the intranet, i.net. The research articles relevant to projects carried out at ITI and of national importance were downloaded and stored on the server for future reference. The ISC continued to provide lending facilities to its members but

the reference service was limited access only to urgent reference work due to the prevailing COVID-19 pandemic.

The banning of chemical fertilizers and the popularisation of organic farming by the Sri Lankan government made researchers and the public keen on gathering information on organic agriculture. A new database, named Organic Farming was developed with research papers published related to organic farming in Sri Lanka. The database was officially launched at the inauguration ceremony of the 5th ITI Biennial Research Symposium by the State Minister of Digital Technology and Enterprise Development, Hon. Namal Rajapakse.

The lectures of NVQ level 4 - Certificate Course for Laboratory Assistants, coordinated by ISC were resumed in March 2021 after the Tertiary and Vocational Education Commission reopened after the pandemic lockdown.

6.4 Awards

- Dr I R M Kottegoda, Dr I P L Jayarathne, Ms J T S T Jayawardane, Mr R C W Arachchi and Mr H A M I T Hettiarachchi received the Gold Medal in the open category under the technical field of Applied Science and Technology for the development of clay filter for removal of fluoride, arsenic and cadmium from drinking water at the awards ceremony organized by the Sri Lanka Inventors Commission.
- Prof R M Dharmadasa and Ms G B V U de Silva received the Silver Medal in the open category under the technical field of Agriculture for the development of natural fungicide and post-harvest quality enhancer at the awards ceremony organized by the Sri Lanka Inventors Commission.
- Ms R M Gihani, Dr H M T Herath and Ms S Rajapakse received the Silver Medal in the open category under the technical field of Food Technology for the development of Dulme pro-cooked cereal mixture for children and adults at the awards ceremony organized by the Sri Lanka Inventors Commission.
- Dr H M T Herath, Eng. Ms A B G C J Silva, Ms I P A Idangodage and Ms R Pitipanaachchi received the Bronze Medal in the open category under the technical field of Food Technology for the development of isotonic Nas Narang sports drink at the awards ceremony organized by the Sri Lanka Inventors Commission.
- Prof R M Dharmadasa received the DASIS award (open category) under the technical field of Agriculture for the development of a natural agricultural pest control agent (NAPCA) by using Sri Lankan-grown medicinal and aromatic plant extracts for the control of sucking agricultural pests at the awards ceremony organized by the Sri Lanka Inventors Commission.
- Dr H P P S Somasiri and Dr G V V Liyanaarachchi received the President's Award for scientific publication for the paper titled validation of a reversed-phase high-performance liquid chromatographic method for the determination of free amino acids in rice using l-theanine as the internal standard, Food Chemistry, 240, p. 196-203.

- Dr K Mahatantila received the President's Award for scientific publication for the paper titled influence of bioenergy waste biochar on the proton-and ligand-promoted release of Pb and Cu in a shooting range soil, *Science of the Total Environment*, 625, p. 547-554.
- Dr I G N Hewajulige received a certificate of excellence in corporate and professional competition 'Vanithabimana', 2021, in the category of the state sector.

6.5 Capacity building

Postgraduate studies

- Ms G V V Liyanaarachchi obtained her PhD degree from the University of Colombo for studies on "Amino acid profiling of selected Sri Lankan rice (*Oryza sativa*) varieties using liquid chromatographic techniques" under the supervision of Dr H P P S Somasiri, Prof. K R R Mahanama and Prof. P A N Punyasiri.
- Ms U Rajawardane obtained her PhD degree from the University of Colombo for studies on "Isolation, identification and characterization of health beneficial bacteria and pathogenic micro-flora of dairy origin in Sri Lanka" under the supervision of Dr I G N Hewajulige, Prof. Chandrika Nanayakkara and Dr Pasan Fernando.
- Ms A U W Dissanayake completed her MSc with the research "Assessment of proximate composition, physical properties and antioxidant properties of flour made from underutilized tuber crops in Sri Lanka" at the University of Sri Jayawardanapura.
- Mr S V Amarasena completed his MSc in Food Science and Technology with the research "Determination of optimum tempering period of matured coconut to extract coconut water for bottling" at the University of Sri Jayawardanapura.

On-going PhD/MPhil/MSc studies

- Ms H Karunaratne continues her PhD studies on "Microflora in different types of tea produced in three different elevations in Sri Lanka" at the University of Kelaniya.
- Mr H D Weeratunge continues his PhD studies on "Investigation on natural fragrances and other volatiles from Sri Lankan flora and their industrial applications" at the University of Colombo.
- Ms H H K Achala continues her PhD Studies on "Genetic and phenotypic studies of synthetic abscisic acid signal modulators" at the College of Chemistry, Central China Normal University, Wuhan, Hubei, People's Republic of China.
- Ms G U Chandrasiri continues her PhD studies on "Investigation on trace elements content in selected rice varieties and the uptake of toxic elements by rice under simulated environments" at the University of Colombo.
- Ms K D S M Karunaratne continues her PhD studies on "Development of a database for mineral profiles, TLC profiles and phenolic profiles of selected traditional and widely consuming, improved rice varieties of Sri Lanka" at the University of Colombo.

- Ms G De Silva continues her PhD studies on “Design and optimization of non-thermal plasma sterilization system for selected powdered spices at the Department of Chemical and Process Engineering” of the University of Moratuwa.
- Ms M Samaranayake continues her PhD studies on “A study on selected nutritional properties and seed chemical characteristics of a range of Sri Lankan rice varieties” at the University of Colombo.
- Mr N Gunasekara continues his PhD studies on “Quantitative determination of antimicrobial residues, mycotoxins and pesticide residues in bovine milk produced in Sri Lanka to profile potential health risks posed to consumers” at the University of Peradeniya.
- Mr L D C Nayanajith continues his PhD studies on “Microwave synthesis and characterization of graphene and graphene–polymer composites for conducting and other applications” at the University of Colombo.
- Mr K S P Karunadasa continues his PhD Studies on “Conversion of readily available Sri Lankan natural quartz to solar grade silicon for applications in electronic industries” at the University of Peradeniya
- Mr R C W Arachchige continues his PhD studies on “Development of red-clay based water filter/apparatus for the removal of hardness and other contamination in the drinking water at the University of Peradeniya.
- Eng. W R L Wijesekara continues her PhD studies on “Application of anaerobic degradation for the treatment of poultry processing wastewater and its potential for global warming due to methane emission” at the University of Colombo.
- Mr A M K L Abeykoon continues his MPhil studies on “Synthesis and characterization of nanostructures advanced materials for solar water splitting hydrogen production” at the University of Peradeniya.
- Ms R P Dassanayake continues her MPhil studies on “Investigation on trans fats, omega 6:3 ratio and cholesterol in selected food commodities to establish the local permissible levels of fatty acid composition” at the University of Colombo.
- Ms D A T W K Dissanayake continues her MPhil studies on “Research study on degradation kinetics of glyphosate residues, metabolites and additives in conventional fields of application and simulated environments” at the University of Peradeniya.
- Ms P De Zoysa continues her MPhil studies on “Evaluation and quantification of sugar and metal composition of commonly consumed foods based on WHO nutrient profile model for south-east Asian region” at the University of Colombo.
- Ms P S F Perera continues her MPhil studies on “Establishment of multi-compound analytical methods for the determination of nutritive and non-nutritive sugar substitute sweeteners applied in the food industry of Sri Lanka” at the University of Colombo.
- Mr H M B I Gunathilaka continues his MSc studies in Material Science on “Development of LiCl-based gel electrolyte and their applications on electrochromic devices at the University of Peradeniya.

- Ms M Jayasinghe continues her MSc studies on “Identification of potential spoilage and pathogenic microorganisms associated with the production of thermally processed king coconut water (*Cocos nucifera* var. *aurantiaca*) in Sri Lanka” at the University of Kelaniya.
- Ms S Liyanage continues her MSc studies on “Physicochemical, nutritional and antioxidants properties of selected pipeline rice varieties of Sri Lanka” at the University of Sri Jayawardenepura.
- Ms S Jayarathne continues her MSc studies on “Identification of aroma compounds, heavy metals and aflatoxin in value-added coconut oil and coconut oil-based cosmetic products” at the University of Sri Jayawardenepura.
- Ms J A Hasara Abeyrathna continues her MSc studies in Food Science and Technology at the University of Peradeniya.
- Ms P M Kaluperuma continues her MSc studies in Food Science and Technology at the University of Sri Jayawardenepura.
- Ms K M B P P Kalaotuwawe continues her MSc studies in Environmental Pollution Control Engineering at the Faculty of Engineering, University of Peradeniya.
- Ms H Prathibha continues her MSc studies in Industrial Chemistry at the University of Kelaniya.
- Mr P D Buddika continues his MSc studies in Applied Electronics at the University of Colombo.
- Ms U I Medawatta continues her MSc studies at the University of Sri Jayawardenepura.
- Ms M S Kumarapeli continues her MSc studies in Analytical Chemistry at the University of Kelaniya.
- Mr H A A Perera continues her MSc studies in Food and Nutrition at the University of Peradeniya.
- Ms D K S D Piyathissa continues her MSc studies in Food Science and Technology at the University of Sri Jayawardenepura.
- Ms W K N D Dias continues her MSc studies in Food Science and Technology at the University of Sri Jayawardenepura.
- Ms P Jayasinghe continues her MSc studies in Analytical Chemistry at the University of Peradeniya.
- Ms D Dewage continues her MSc studies in Industrial and Environmental Chemistry at the University of Kelaniya.
- Mr N Perera continues her MSc studies in Industrial and Environmental Chemistry at the University of Kelaniya.
- Ms K Premathilake continues her MSc studies in Food and Nutrition at the University of Peradeniya.

6.6 Overseas training programmes

- Dr R C L De Silva participated in a virtual workshop on the Startup India International Summit (SIIS 2021) organized by the High Commission of India in association with the confederation of Indian industry and Startup India from 15th-16th January 2021.
- Dr L D A M Arawwawala, Prof R M Dharmadasa, Dr C Wijesiriwardena, Dr N Amunugoda, Dr T Herath, Mr S Madage and Mr T Gunawardhana participated in the ITEC course through a webinar on “Entrepreneurship innovation and design for catalyzing rural economy” organized by Indian Institute of Technology, New Delhi, India from 6th -17th September 2021.
- Dr N Amunugoda, Mr T Gunawardhana and Ms G De Silva participated in an online training on “Milk powder manufacturing technology, R&D related to process design and product quality development” organized by HIC Energy Consulting/Training and Development Group.
- Ms G D T A Pathiragoda, Ms R C Lewangama and Ms L S Vithanawasm participated in an online training on the “Micropipette calibration” organized by the PTB quality infrastructure project phase on 21st September 2021.

6.7 Local training programmes

- Dr S Jayawardana. Online lecture on “Human nutrition during work from home time” food for all - Kadamandiya Food Bank.
- Dr S Jayawardana participated in a webinar on “Writing articles for high impact journals: a guide to researchers” organized by the Institution of Engineers, Sri Lanka (IESL) and the National Science Foundation (NSF).
- Mr A M K L Abeykoon participated in a workshop on “Value-added products from Sri Lankan carbonate deposits for a sustainable economy” organized by the Board of Study in Earth Science, PGIS, the University of Peradeniya on 16th August 2021.
- Mr H M B I Gunathilaka and Mr A M K L Abeykoon joined a one-year course “Diploma in ceramic technology” organized by CENTEC in September 2021.
- Ms G D T A Pathiragoda participated in an online training program "Transition training on ISO 50003:2021 energy management system" organized for SLAB on 27th September 2021.
- Ms M D Y Milani and Dr C H Manorathne participated in a virtual workshop on “Patenting for scientists, researchers and innovators” organized by National Science Foundation and National Intellectual Property Organization on 23rd December 2021.

6.8 Promotional events

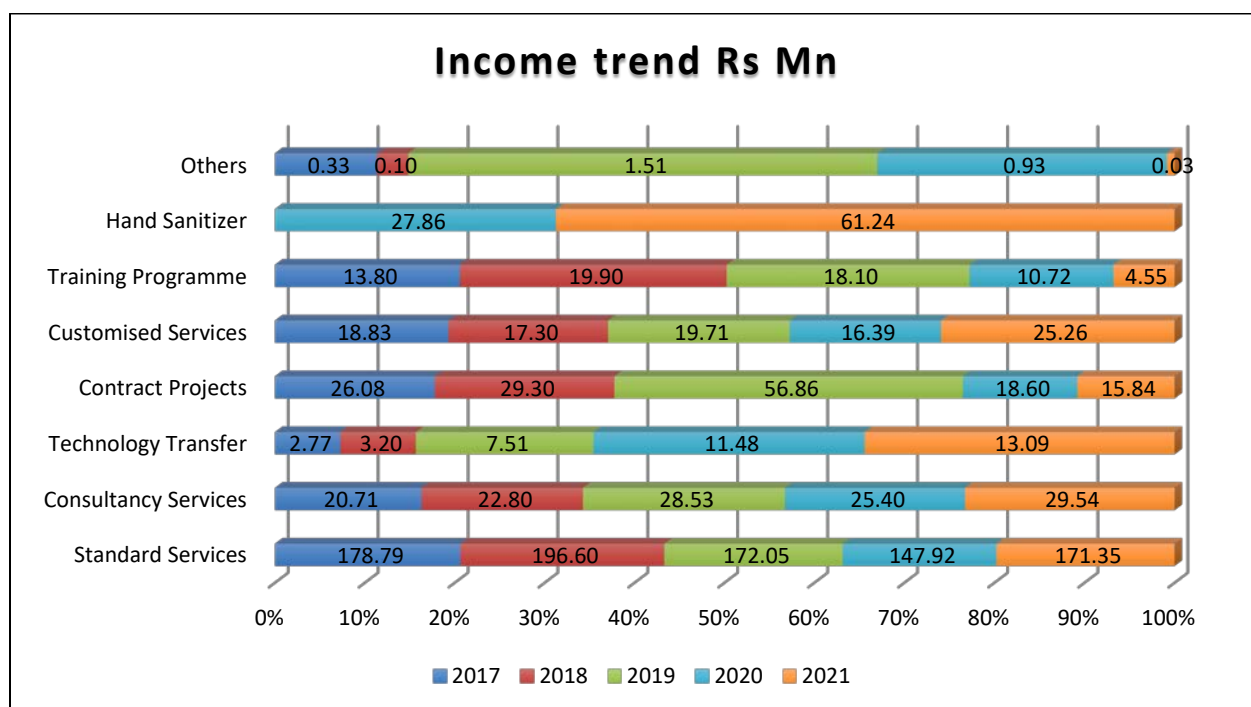
- National Symposium on understanding the challenges experienced by women engaged in micro, small and medium enterprises in Sri Lanka and identifying key policy recommendations at Hilton Colombo Residencies on 24th and 25th February 2021.
- The export Marketplace program for women entrepreneurs coincides with international women's day at HARTI, Colombo on 8th March 2021.
- Vidatha Technology Service Clinics to introduce ITI technologies in Colombo, Ratnapura, Matara, Gampaha and online at Kandy, Badulla, Monaragala, Anuradhapura, Polonnaruwa, Matale, Nuwara Eliya, Kalutara, Kurunegala, Puttalam, Galle, Hambantota, and Kegalle.

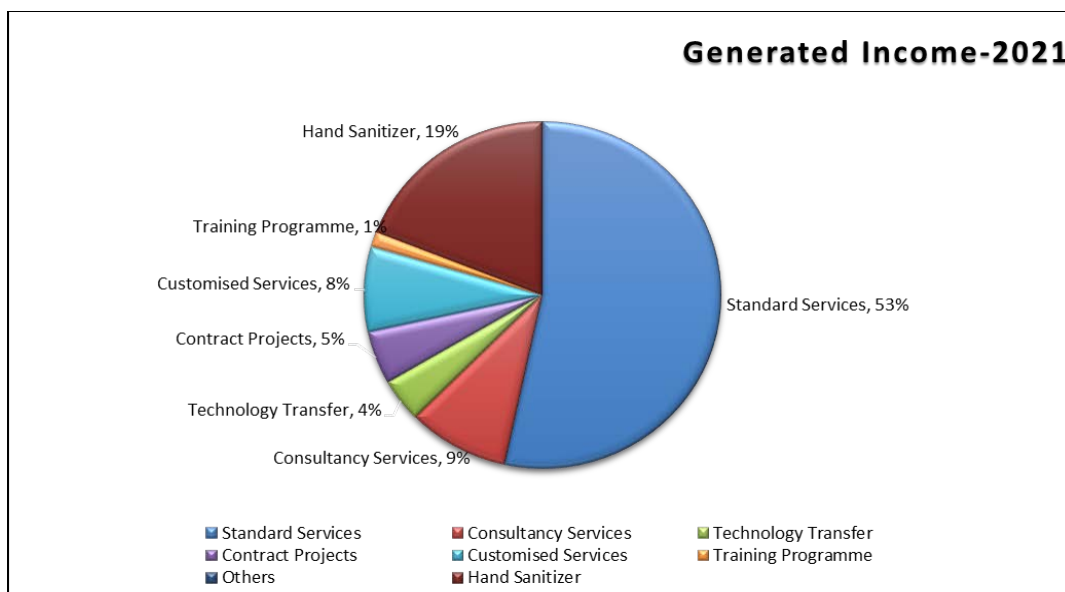
CHAPTER 07 – FINANCIAL PERFORMANCE

7.1 Financial Report

Income

The Institute recorded Rs 320 Mn income from business activities which is a 23% increase from the previous year's recorded income of Rs 259 Mn. The reason for the increase in income was that the institute strategically diversified the business into the production of Hand Sanitizers (Rs 61 Mn) to address the COVID-19 pandemic. Testing and calibration services continued to be the leading income generation services of the institute by contributing 54% (Rs 171 Mn) to the total income and customized services recorded a makeable increase of Rs 9 Mn. Other business sources such as consultancy services and technology transfers showed a slight increase of Rs 6 Mn and the income from training showed a slight drop compared with the previous years. The core business of technology transfer, consultancy services and training activities had an impact due to the country's economic crises and the COVID-19 pandemic.

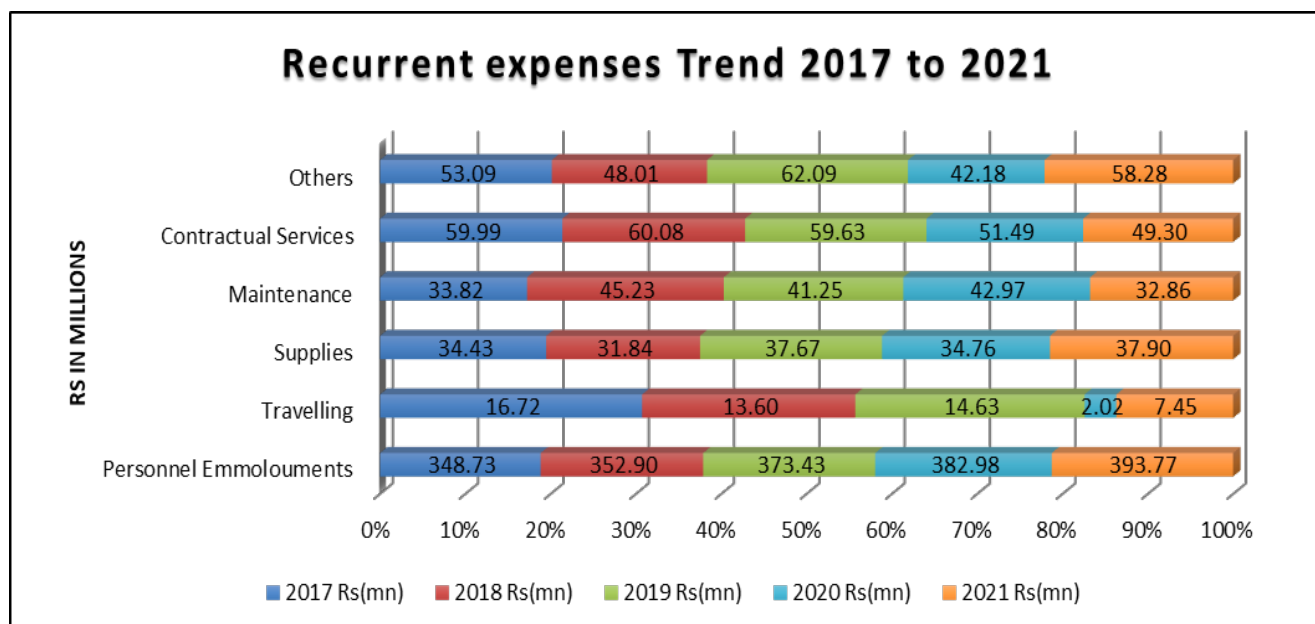


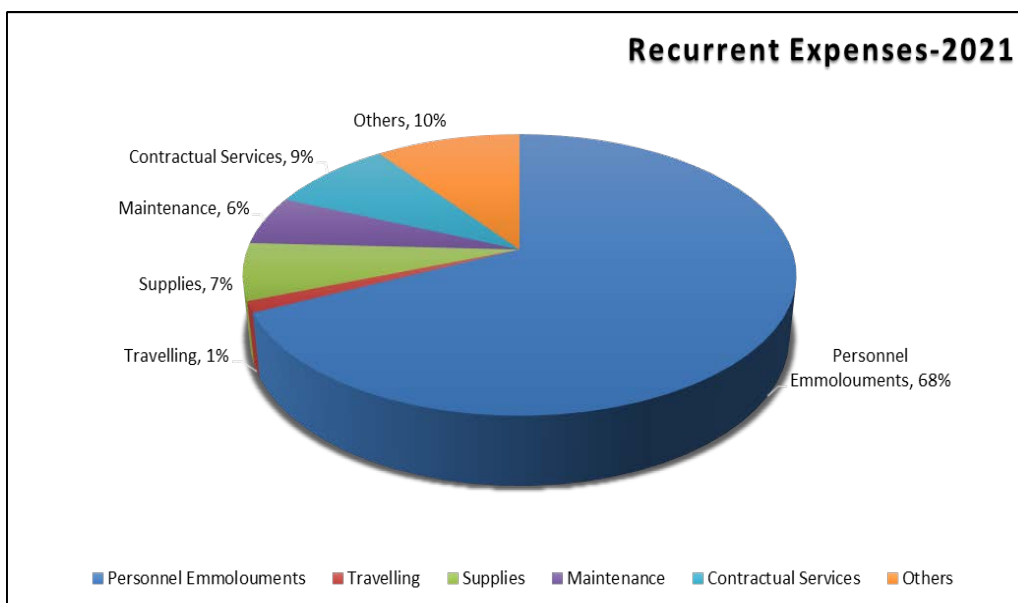


Expenditure-Recurrent

However, the Institute managed to maintain the operational cost by a slight increase of Rs 23 Mn which is 4% and the Institute recorded an operational cost of Rs 579 Mn (2020-Rs 556 Mn) in 2021 while increasing the income by 23%.

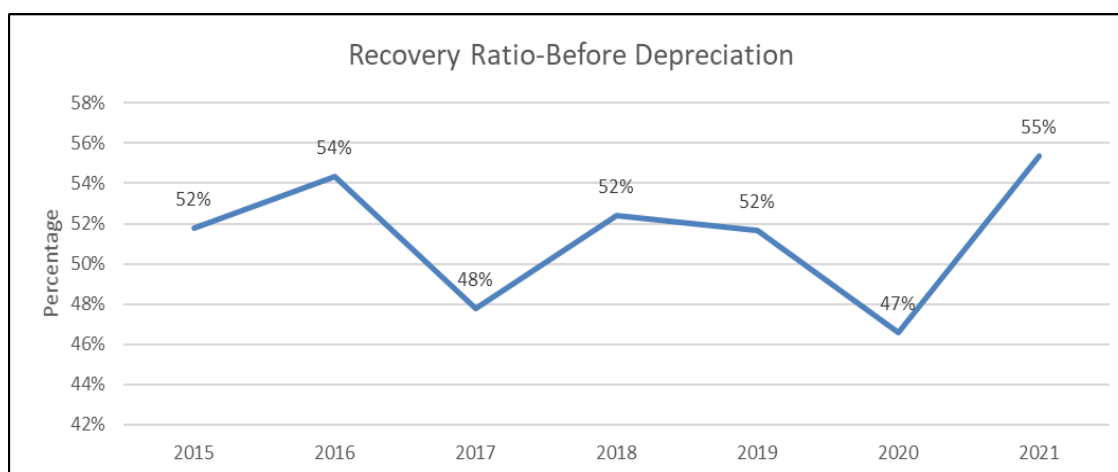
The performance-based incentives were paid to the staff for the 19th consecutive year as the institute achieved overall income targets set for the year.





Recovery ratio

The Institute Income over Expenses recovery ratio has been recorded as 55% which showed a good increase from the previous year's 47%. The net income has been increased by Rs 61 Mn while operation cost has been controlled as same as previous years cost.



Grants received

The Institute received Rs 279 Mn during 2021(Rs 270 Mn in 2020) as recurrent grants for subsidized to personal emoluments costs.

The Government allocated Rs 80 Mn as Capital grants to the Institute in 2021. However, Institute manages the procurement of all Capital assets to Rs 54 Mn which is equal to the grant released by the Government. The Institute used more than 100% of the received funds for procuring high-end equipment which contributes enhance the income in future years.

CHAPTER 08 – RESEARCH OUTPUTS

8.1 5th Biennial Research Symposium

The 5th Biennial Research Symposium of ITI was successfully held at Modern Research and Development Complex (MRDC), Malabe from 10th–12th November 2021 under the theme ”Positioning Science, Technology & Research for New Normal Industrial Challenges” along with World Science Day. The inauguration was held on the 10th of November at Shangri-La Colombo. The message from the Chief Guest, H.E. Gotabaya Rajapakse, the President of the Democratic Socialist Republic of Sri Lanka and Minister of Technology was delivered by Hon. Namal Rajapakse Minister of Youth & Sports, Minister of Development Co-ordination & Monitoring and State Minister of Digital Technology & Enterprise Development graced the occasion as the Guest of Honour. Hon. Prof. Tissa Vitarana, Member of Parliament, Hon. Dr Bandula Gunawardena, Minister of Trade, and Mr Jayantha de Silva, Secretary of Ministry of Technology graced the occasion as special guests.

H E Dr Akhtar Nazir, Executive Director, Commission on Science and Technology for Sustainable Development in the South (COMSATS) and Federal Secretary, Ministry of Science and Technology, Government of Pakistan graced the occasion through a virtual platform briefed on the COMSAT activities and the collaborations with Sri Lanka. The Director General of ITI Prof. Radhika Samarasekera welcomed the gathering.

Hon. Prof. Tissa Vitarana delivered the keynote address under the symposium theme, emphasizing the need for industrial development to overcome the challenges due to the present economic crisis and COVID-19 pandemic and highlighted the task of S&T Institute like ITI and NERD to assist the industry with technology and innovations.

The outstanding performance of ITI scientists, engineers and technologists has been felicitated during the award ceremony and more than 30 staff members received awards and certificates. Technical sessions were held at MRDC on the 11th of November. The scholarly articles were published in the special symposium proceedings. The symposium was followed by a post-symposium workshop on “Entrepreneurship Development in New Normal: Challenges and way forward” on the 12th of November targeting an audience of MSMEs. More than 50 international and local participants joined the workshop via a virtual platform.

8.2 Publications in referred journals

1. Abeykoon, A.M.C.N., Herath, H.M.T. and Jayasinghe, M. A. (2021). *In-vitro* analysis of trypsin and alpha–amylase inhibitory activities in selected legume varieties in Sri Lanka. *Asian Food Science Journal* 20(1):1-19.
2. Amarasiri, S.S., Attanayake, A.P., Arawwawala, L.D.A.M., Jayatilaka, K.A.P.W. and Mudduwa, L.K.B. (2021). Nephroprotective activity of *Vetiveria zizanioides* (L) Nash

supplement in doxorubicin-induced nephrotoxicity model of Wistar rats. *Journal of Food Bio-Chemistry* 45(10).

3. Amunugoda, P.N.R.J., De Silva, A.B.G.C.J., Gunawardane, K.V.T., Pitipanaarachchi, R., Silva, A.M.C.U. and Thilina, D.G.W. (2020). Spray drying of ginger and physical and micro powder, an advanced food material. *Frontiers in Advanced Materials Research*:9-17.
4. Amunugoda, P.N.R.J., Wilson, W.R.S., Senanayake, S.A.M.A.N.S., Kulathunaga, K.D. G. (2021). Performance of prototype solar tunnel drier developed by the University of Hohenheim under local environmental conditions in Sri Lanka. *Front Adv Mat Res*: 44-55.
5. Dilhara, D.G.N, Dharmadasa, R.M., Abeysinghe, D.C., Wijeeakara, R.G.S., Prathapasinghe, G. and Somea T. (2021). Ethnopharmacological survey on medicinal plants used for cosmetic treatments in traditional and ayurveda systems of medicine in Sri Lanka. *Evidence-Based Complementary and Alternative Medicine*. ID 5599654 | <https://doi.org/10.1155/2021/5599654>.
6. De Costa, M.D.R., De Silva, R.C.L., Nayanajith, L.D.C., Colombage, H.C.D.P., Milani, M.D.Y., Rosa, S.R.D. and Kottegoda, I.R.M. (2021). Electrochemical performance and material characterization of reduced graphene oxide (rGO)/titanium dioxide (TiO₂) composite as electrodes for supercapacitors. *Sri Lankan Journal of Physics* 22(2):1–12.
7. De Silva, G.B.V.U., Dharmadasa, R.M., Senanayake, R.A.S.P. and Lintha, A. (2021). Selection of superior quality *Cymbopogon nardus* (L.) Rendle (Poaceae) populations by means of quantity and quality of essential oils. *World Journal of Agricultural Research* 9(1): 1-8.
8. Divisekera, D.M.W.D., Madage, S.S.K., Jayawardana, T.M.D.A., Medis, W.U.D., Indunil, R.K.P.N. and Gooneratne, J. (2021). Pathogenic and spoilage-causing microorganisms associated with the traditional seafood product Jaadi manufactured in the southern and western coastal belt of Sri Lanka. *Asian Food Science Journal* 20(10):25-35.
9. Divisekera, D.M.W.D., Samarasekera, J.K.R.R., Hettiarachchi, C., Maharajan, R., Gooneratne, J., Choudhary, M.I., Gopalakrishnan, S., Wahab, A.T. and Mazumdar, S.D. (2021). Oral toxicity evaluation of probiotic strains isolated from Finger millet [*Eleusine coracana* (L.) Gaertn.] in Wistar rat models (*in vivo*). *Archives of Ecotoxicology* 3(3): 91-102.
10. Gamage, D.G.N.D., Dharmadasa, R.M., Abeysinghe, D.C., Wijesekara, R.G.S., Prathapasinghe, G.A. and Takao, S. (2021). Assessment of phytochemical contents and total antioxidant capacity of five medicinal plants with cosmetic potential under three different drying methods. *World Journal of Agricultural Research* 9(1): 24-28.
11. Gamage, D.G.N.D., Dharmadasa, R.M., Abeysinghe, D.C., Wijesekara, R.G.S., Prathapasinghe, G.A. and Takao, S.(2021). Effect of drying methods and type of packaging materials on phytochemical content and total antioxidant capacity of five medicinal plants with cosmetic potential over three months storage at ambient temperature. *World Journal of Agricultural Research* 9(2):73-79.
12. Gamage, D.G.N.D., Dharmadasa, R.M., Abeysinghe, D.C., Wijesekara, R.G.S., Prathapasinghe, G.A. and Takao, S. (2021). Emerging herbal cosmetic production in Sri

Lanka: Identifying possible interventions for the development of the herbal cosmetic industry. *Scientifica* 10.

13. Gunathilaka, M.D.T.L., Dilrangi, K.H., Ranasinghe, P., Samarakoon, K.W. and Peiris, L.D.C.(2021). Mechanistic insight into apoptotic induction in human rhabdomyosarcoma and breast adenocarcinoma cells by *Chnoospora minima*: A Sri Lankan brown seaweed. *Pharmaceuticals* 14:1154.
14. Hewageegana, H.G.S.P., Hewageegana, A.U. and Arawwawala, L.D.A.M. (2021). Purification, detoxification and incineration methods of minerals and metals in traditional medicine. *Evidence-Based Complementary and Alternative Medicine*
Article ID 6634553 | <https://doi.org/10.1155/2021/6634553>
15. Jayasinghe, M.D. and Hewajulige, I.G.N. (2021). King coconut - The golden nut of Sri Lanka. *Sri Lanka Journal of Food and Agriculture* 7(1): 9-12.
16. Jayasuriya, W.J.A.B.N., Jayaweera, N.D., Adurapotha, H., Meedin, F.D., Uluwaduge, D.I. and Arawwawala, L.D.A.M. (2021). Antimicrobial effect of polyphenols enriched fractions of *Moringa oleifera* Lam. Leaves at the flowering stage against microbial strains causing oral and wound infections. *Pharmaceutical Journal of Sri Lanka* 11(1): 27–40.
17. Jayawardana, S. A. S., Samarasekera, J. K. R. R., Hettiarachchi, G. H. C. M. and Gooneratne, J. (2021). Formulation and quality evaluation of finger millet (*Eleusine coracana* (L.) Gaertn.) flour incorporated biscuits. *Food Science and Technology International* 28(5): 430-439.
18. Jayawardana, S. A. S., Samarasekera, J. K. R. R., Hettiarachchi, G. H. C. M., Gooneratne, J., Choudhary, M. I., Jabeen, A. (2021). Anti-inflammatory and antioxidant properties of finger millet (*Eleusine coracana* (L.) Gaertn.) varieties cultivated in Sri Lanka. *BioMed Research International*:1-10.
19. Jayaweera, V., Liyanage, W.L.N.C., Silva, R.C.L.D., Rosa, S.R.D. and Kottegoda, I.R.M., (2021). Reduced graphene oxide-sno2-polyaniline ternary composite for high-performance supercapacitors. *Material Science Research India* 18(2):206-216.
20. Karunadasa, K.S.P., Rathnayake, D., Manoratne, C.H., Pitawala, A. and Rajapakse, G. (2021). A binder-free composite of graphite and kaolinite as a stable working electrode for general electrochemical applications. *Electrochemical Science Advances* 1(4).
21. Karunaratne, T.D.N., Arawwawala, L.D.A.M., Sugatharatana, K., Ariyawansa, H.S. and De Silva, H.A. (2021). In vitro antioxidant activities of poly-herbal preparation: Sarasvatha Choorna. *Free Radicals and Antioxidants* 11(2):35-37.
22. Kulatunga, W.M.S.S.K. and Arawwawala, L.D.A.M. (2021). Chemical analysis of anti-venom herbal paste use in Sri Lanka. *South Asian Research Journal of Natural Products* 4(4): 1-7.
23. Kulatunga, W.M.S.S.K., Arawwawala, L.D.A.M. and Herath, H.M.D.R. (2021). Chemical analysis of a traditional herbal analysis used in Sri Lanka for snake bite treatments. *Asian Journal of Applied Chemistry Research* 10 (3-4): 6-11.
24. Liang, Y.D.Y., Nilusha, T., Ritigala, R.T. and Wei, Y. (2021). Prediction of the long-term effect of iron on methane yield in an anaerobic membrane bioreactor using bayesian network meta-Aanalysis. *Membranes* 11: 100.

25. Mapalagama, O.V., Amunugoda, P.N.R.J. and Ranaweera, K.K.D.S.(2021). Decontamination of pineapple (*Ananas cosmosus*) juice using ozone as a non-thermal sterilization method. *Future of Food: Journal on Food, Agriculture and Society* 9 (5).
26. Nandakumar, J., Prabagar, S. and Thuraisingam, S. (2021). Qualitative survey on medicinal plants of Jaffna peninsula, Sri Lanka, identification of endangered species and concerns for their conservation *World Journal of Agricultural Sciences* 17 (5): 409-417.
27. Navoda, N.P.G.D., Samaranayake, M.D.W., Liyanage, S.L., Herath, H.M.T. and Jayasinghe, J.M.J.K. (2021). Determination of functional properties of Sri Lankan Ambarella (*Spondias dulcis* Forst. syn. *Spondias cytherea* Sonn.) fruit and development of vacuum dried Ambarella fruit powder and incorporated soup mix. *Asian Food Science Journal* 20(11):113-122.
28. Nilusha, R.T. and Wei, Y. (2021). New insights into the microbial diversity of cake layer in Yttria composite ceramic tubular membrane in an anaerobic membrane bioreactor (AnMBR). *Membranes* 11:108.
29. Nilusha, R.T., Yu, D., Zhang, J., Abeynayaka, A. and Wei, Y. (2021). Insights into the ambient temperature startup of an anaerobic ceramic membrane bioreactor with thermally hydrolyzed inoculum for domestic wastewater treatment. *Case Studies in Chemical and Environmental Engineering* 4.
30. Perera, D.S.M., De Silva, R.C.L., Nayanajith, L.D.C., Colombage, H.C.D.P., Suresh, T.S., Abeysekera, W.P.K.M. and Kottegoda, I.R.M. (2021). Anti-Inflammatory and antioxidant properties of *Coffea Arabica*/reduced graphene oxide nanocomposite prepared by green synthesis. *Material Science Research India* 18(3):305-317.
31. Prabagar, S., Dharmadasa, R.M., Lintha, A., and Thuraisingam, S. (2021). Accumulation of heavy metals in grapefruit, leaves, soil and water: A study of influential factors and evaluating ecological risks in Jaffna. *Sri Lanka Environmental and Sustainability Indicators* 12(9)
32. Premasiri, D.L.D.A.S., Rajawardana, D.U., Mudannayake, D.C. and Hewajulige, I.G.N. (2021). Isolation, characterization and identification of industrially beneficial probiotic lactic acid bacteria from goat milk. *The Journal of Agricultural Sciences - Sri Lanka* 16 (2):369-382.
33. Silva, S.D., Chandrasekaran, K.N., Fernando, K.H., Withana, W.T.G.S.L. and Athapaththu, A. M. M. H. (2021). Molecular detection of pork adulteration: A study based on dairy products in Sri Lanka. *International Journal of Innovative Science and Research Technology* 6(6): 1536-1540.
34. Silva, P.A.S.N., Arawwawala, L.D.A.M., Kumari, M.W.S.J. and Galappaththy, P. (2021). Effect of curcumin on diabetes and its complications: A mini-review. *Journal of Ayurvedic Herbal Medicine* 7(2): 109 – 118.
35. Thilakarathna, G.C., Navaratne, S.B., Wickramasinghe, S.B.I., Ranasinghe, P., Samarkoon, S.R. and Samarasekera, J.K.R.R. (2021). The effect of *Salacia reticulata*, *Syzygium cumini*, *Artocarpus heterophyllus*, and *Cassia auriculata* on controlling the rapid formation of advanced glycation end-products. *Journal of Ayurveda and Integrative medicine* 12:261-268.

36. Viyanage, M.P., Manage, T.R.T., De Silva, R.C.L., Nayanajith, L.D.C., Milani, M.Y.D. and Kottegoda, I.R.M. (2021). Mechanical property evaluation of natural rubber/vein graphite composites. *Sri Lankan Journal of Physics* 22(1):29.
37. Weerasinghe, W.A.B.S. and Amunugoda, P.N.R.J. (2021). UV treatment on inactivation of fungal contamination of Sri Lankan black pepper (*Piper nigrum*) seed and powder. *Front Adv Mat Res*:36-41.
38. Wickramasuriya, A.I.R., Arachchige, R.C.W. and Kottegoda, I.R.M. (2021). Characterization and modification of clay for removal of drinking water hardness. *Material Science Research India* 18(3): 318-331.
39. Wijesekara, W.R.L., Lokupitiya, E. and Najim, M.M.M. (2021). Treatment and disposal of poultry processing wastewater in Sri Lanka. *Sri Lanka Journal of Technology* 2(1): 8-15.
40. Wijayawardhana, N.M., Cooray, M.M.D.U., Meedin, D.F.D., Uluwaduge, D.I., Arawwawala, L.D.A.M., and Jayasuriya, W.J.A.B.N. (2021). Antimicrobial activity of a combination of three natural plant extracts and the development of herbal soap. *Pharmaceutical Sciences Asia* 48(6): 523-534.

8.3 Communications International

1. Bamunuarachchi, B.A.S.U., Samarasekara, R., Dasanayaka, P.N., Liyanarachchi, G.D. Perera, H.D.S.M. (2021). Formulation and evaluation of a novel toothpaste incorporated with an extract of *Moringa oleifera* and its antibacterial potential against oral pathogenic *Staphylococcus aureus*. *International Conference on Innovation and Emerging Technologies (ICIET)-ID* 36.
2. Rajawardena, D.U., Hewajulige, I.G.N. and Nanayakkara, C.M. (2021). Technological characterization on probiotic lactic acid bacteria and yeast from bovine milk and curd made with indigenous starters of Sri Lanka, Extended abstract at the 10th International Conference on Fermented Foods. *Health Status and Social Well-being organized by the University of Peradeniya and SASNET –Lund University, Sweden*.A33, pp. 94-97.
3. Samanudeen, R.M., Jayasuriya, B., Arawwawala, M., Hettiarachchi, P., Suresh, S. (2021). Neutralizing effect of different extracts of the whole plant of *Eclipta prostrate* using *in vitro* methods. *Proceedings of the 2nd Annual CNPD (Centre for Natural Products Discovery) Conference 2021*, School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool, UK, pp. 54.

8.4 Patents

1. I R M Kottegoda, M T V P Jayaweera, W L N C Liyanage and C P H Rajapaksha. Preparation of Graphene/Metal Oxide/Polyaniline nanocomposites for application in energy storage devices. Sri Lanka Patent No. 18303 (28th April 2021)
2. I R M Kottegoda and R C W Arachchi. Serial Pot Filter System for Removal of Hardness, fluoride and Heavy Metal Ions from Water. Sri Lanka Patent No. 20234 (5th July 2021)

3. I R M Kottegoda and W R L Wijesekara. Catalyst-supported solar treatment for decontamination of agrochemical-contaminated wastewater. Sri Lanka Patent No. 20264 (28th April 2021)

8.5 Patents applied

1. I R M Kottegoda, D S M Perera, H C D P Colombage, R C L De Silva and L D C Nayanajith, *Coffea-arabica*/graphene nanocomposite with effective antioxidant and anti-inflammatory properties for biomedical application and preparation method thereof, Sri Lanka Patent application No. 22011.

Executive Staff

as at 31st December 2021

DIRECTOR GENERAL / C.E.O

Prof. J K R R Samarasekera (Mrs)
*BSc(Hons)(Colombo), PhD(Rothamsted), CChem,
MChemC, MIBiol*

Additional Director General, Research & Development

Prof I G N Hewajulige (Mrs)
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PhD(Colombo)*

Additional Director General, Technical Services

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*BSc(Spl)(Peradeniya), MSc(Peradeniya), PhD (Colombo),
MChemC,, CChem*

Additional Director General, Administration & Operation

(Vacant)

RESEARCH & DEVELOPMENT

FOOD TECHNOLOGY SECTION

Director, Food Technology Section

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BSc (Spl)(Peradeniya), PhD(Open University)

Principal Research Scientist

Dr H M T Herath (Mrs)
*BSc(Hons)(Peradeniya),
MPhil(Sri Jayewardanepura), PhD(Kelaniya)
MChemC,*

Dr D M W D Divisekara (Mrs)
BSc (Bangalore), MSc (Bangalore), PhD (Colombo)

Senior Research Scientist

Dr D U Rajawardana (Miss)
BSc(Bangalore), MSc(Peradeniya)

Research Scientists

S S K Madage
BSc (Peradeniya)

A M C U Binduhewa (Mrs)
BSc(Peradeniya), MSc (Sri Jayawardanapura)

K V T Gunawardhana
BSc(Spl)(Hon)(Peradeniya)

M M N P Gunasekera
BSc(Spl)(Hons)(Colombo)

W D W Samaranayake (Miss)
BSc(Spl)Hons(Sri Jayawardanepura)

Dr S A S Jayawardene (Mrs)
BSc.(Spl) (Sri Jayawardanepura), PhD (Colombo)

D V A Nilukshi (Mrs)
BSc(Spl)(Hons)(Sri Jayawardanepura)

Research Engineer

A B G C J de Silva (Mrs)
BSc(Eng)(Moratuwa), MSc (Moratuwa)

Research Technologist

A W D Priyangani (Mrs)
NDT(Moratuwa), PGD (Colombo)

T M D A Jayawardena (Miss)
BSc (Open University)

Management Officer

M D L C Gunathilake (Mrs)

HERBAL TECHNOLOGY SECTION

Herbal Technology Section / Research Professor

Prof. R M Dharmadasa
*BSc(Hons)(Ruhuna), MPhil(Sri Jayewardanepura),
PhD (Sri Jayawardanepura), MIBiol*

Research Fellow

Dr P Ranasinghe
*BSc(Hons)(Peradeniya), MPhil(Colombo),
PhD(Colombo), MIBiol*

Dr T D C M K Wijesiriwardena
*BSc(Bangalore), MSc(Gujarat), PhD(Gujarat
Ayurved University)*

Principal Research Scientists

Dr S Chelvendran (Mrs)
BSc(Spl)(Hons)(Jaffna), PhD(Peradeniya)

Dr L D A M Arawwawala (Mrs)
*BSc(Hons)(Peradeniya), MSc(Sri Jayewardanepura),
MPhil(Peradeniya), PhD(Kelaniya), MIBiol, MChemC,*

Senior Research Scientist

H D Weeratunga
BSc(Spl)(Colombo), MSc (Midway)

Research Scientists

U I Medawatta (Mrs)
BSc(National university, Republic of Korea)

L A G Dilkhushi (Miss)
BSc (Wayamba)

Senior Research Technologist

P I P K Fernando (Mrs)
LTCC (ICChemC), B.tech (UNIVOTEC)

V S Bandara (Mrs)
LTCC(Merit)(ICChemC), Grad ICChemC, MRSC(UK)

Research Technologist

Mr. U K A Samarasinghe
DLTC (ICChem)

Management Officer

M D L C Gunathilake (Mrs)
B.com (Sri Jayewardenepura)

MATERIALS TECHNOLOGY SECTION

Director, Materials Technology Section

(Vacant)

Research Fellow

Dr I R M Kottegoda (Mrs)
*BSc(Colombo), MPhil(Sri Jayewardenepura),
PhD(Colombo)*

Senior Research Scientists

L D C Nayanajith
BSc(Chem)(Hons)(Peradeniya), MSc(Peradeniya)

Dr C H Manaratne
BSc(Rajarata), MPhil(Peradeniya), PhD(Colombo)

Dr R C L De Silva
BSc, MBA, MPhil(Open University), PhD(Colombo)

Research Scientists

M D Y Milani (Mrs)
BSc(Spl)(Colombo), MSc(Moratuwa)

K S P Karunadasa
BSc(Spl)(Hons)(Peradeniya)

A M K L Abeykoon
BSc (Sabaragamuwa)

H M B I Gunathilake
BSc (Sabaragamuwa)

Research Engineer

H C D P Colombage (Mrs)
BSc(Eng)(Moratuwa)

Senior Research Technologist

D S Samarawickrama
Phd(Colombo) MBA (Open University),

Research Technologist

R C W Arachchi
BSc (Open University)

ENVIRONMENTAL TECHNOLOGY SECTION

Director, Environmental Technology Section

(Vacant)

Principal Research Engineer

N A T D D Gunasekera
BSc(Eng)(Moratuwa), Associate Member (IESL)

W R L Wijesekera (Mrs)
*NDT(Che.Eng.Tech)(Moratuwa), ECE (Che.Eng)(UK)
MSc(Colombo)*

Senior Research Scientist

Dr. P Subramaniam
Bsc (Jaffna) PhD(UK)

Research Scientists

R T Nilusha (Mrs)
Bsc(Spl)(Sabaragamuwa)

Senior Research Engineers

D M H S Dissanayake (Mrs)
BSc(Eng)(Hons)(Moratuwa), Msc(Moratuwa)

Research Engineer

K A N Kumarasinghe (Mrs)
BSc(Eng)(Peradeniya)

H L G S Liyanage (Mrs)
BSc.Eng (Moratuwa)

A H S Jayasekera (Mrs)
BSc.Eng (Moratuwa)

Senior Research Technologist

J A P V Jayasinghe
NDT(Moratuwa)

Research Technologist

L A D Y Athukorala(Mrs)
NCT(TC Rathmalana)

BIO TECHNOLOGY SECTION

Director, Bio Technology Section

(Vacant)

Senior Research Scientists

Dr (Miss) A M M H Athapattu
BSc(Colombo) PhD(Kelaniya)

Research Scientists

H H K Achala (Miss)
BSc(Spl)(Colombo), MSc(Bio Tech)(Peradeniya)

W T G S L Withana (Mrs)
BSc(Ruhuna)

B J G Jayawardhane (Mrs)
BSc(Peradeniya), M.Phil(Peradeniya)

OFFICE OF THE ADDITIONAL DIRECTOR GENERAL – RESEARCH & DEVELOPMENT

Management Officer

W S K Fernando (Mrs)

TECHNICAL SERVICES

CHEMICAL & MICROBIOLOGICAL LABORATORY

Director - Chemical & Microbiological Laboratory/ Principal Research Scientist

M N A Mubarak
BSc(Spl)(Hons), MSc(Delft)

Senior Research Scientist

K S Weerakkody
BSc(Peradeniya), MSc(Kelaniya)

S H S Karunaratne (Miss)
BSc(Bangalore), MSc(Kelaniya)

Dr W D K Mahatantila (Mrs)
BSc(Sabaragamuwa), MPhil(PGIS), PhD(Japan)

Research Scientists

P S F Perera (Mrs)
LTCC(ICChemC), BSc(Peradeniya), MSc(Colombo)

M R P Dassanayake (Mrs)
BSc(Spl)(Hons)(Sri Jayewardenepura)

S K Liyanage (Mrs)
BSc(Kelaniya), MSc(Kelaniya)

H P E de Zoyza (Mrs)
*BSc(Spl)(Sri Jayawardanepura) Prof. Diploma(CIM)
Diploma in Quality Management (SLSI)*

R A P S De Alwis (Mrs)
BSc (Kelaniya)

S I Weerasekera (Mrs)
BSc (Kelaniya)

Dr W C Prasadini (Mrs)
*BSc(Sri Jayawardanepura), PGD(UK), PhD
(Kelaniya)*

D R C Perera
BSc(Uva Wellassa)

T G Vithanage (Mrs)
BSc(Colombo)

D M D M Dissanayake (Mrs)
B.Sc (Kelaniya), M.Phil (Peradeniya) ,

Senior Research Technologists

P K G De Alwis (Mrs)
LTCC (ICChemC), DLTC(ICChemC)

M M C B Nawarathna
DTLC(ICChemC)

R N R Jayaratne
BSc (Colombo), MPhil (Peradeniya)

V J Chithran
LTTC(ICChemC)

C Vidyaratne (Mrs)
B Sc(Open University)

H M K Pathirana
BSc(Kelaniya)

Research Technologists

S P Hettiarachchi
LTCC(ICChemC), DLTC(ICChemC)

A A N U Amarasinghe (Mrs)
BSc(Open University), DLTC(ICChemC)

A L S Malwenna (Mrs)
BSc(Open University), DLTC(ICChemC)

K R M Gunarathne (Mrs)
BSc (Peradeniya), MSc(Peradeniya)

Management Officers

B L U R Kumari (Mrs)

RESIDUE ANALYSIS LABORATORY

Director, Residue Analysis Laboratory

(Vacant)

Research Scientists

D A T W K Dissanayake (Mrs)
BSc(Spl)(Hons)(Peradeniya)

G U Chandarasiri (Mrs)
BSc(Spl)(Hons)(Sri Jayawardenepura)

A U W Dissanayaka (Mrs)
BSc(Sri Jayawardenepura)

Ms K D Madushani (Mrs)
BSc(Ruhuna)

Senior Research Technologist

H A A Perera
LTTC(ChemC), Dip. In Management Programme

Research Technologist

K D S M Karunarathne (Ms)
BSc (Kelaniya), MSc (Colombo)

R A D S M R Weerasekera(Miss)
Bsc(Kelaniya), Msc(Oeradeniya)

M L R Chathuranga
Bsc(Open University)

MATERIALS LABORATORY

Director-Materials Laboratory / Principal Research Engineer

A A M T Adikari
BSc(Hons)(Eng)(Moratuwa)

Research Engineers

C N Vitharana (Mrs)
BSc(Hons)(Eng)(Moratuwa)

P A A S Karunarathne (Mrs)
BSc(Hons)(Eng)(Moratuwa)

L S R Widuranga
BSc(Eng)(Moratuwa)

R A K Kumara
BSc(Eng)(Moratuwa)

Research Scientist

K K K H Amaranayake
BSc(Spl)(Kelaniya)

M V K Munasinghe (Miss)
*BSc (Sabaragamuwa), MPhil (Peradeniya)
ICChemC(Licentiate)*

Research Technologists

B M P Fernando (Mrs)
DLTC(Chem), Dip(Plastic & Rubber Institute)

W A M Priyanwada (Mrs)
DLTC(ICChem)

M V P N Somathilake
NDE(IET)

M M Niyangama
BIT(Colombo)

M M Warshahennadi(Mrs)
DLTC(ICChem.)

INDUSTRIAL METROLOGY LABORATORY

Director - Industrial Metrology Laboratory/Principal Research Scientist

Dr W M S Wijesinghe
BSc(Hons)(Sri Jayawardenepura), MSc(USM, Malaysia), PhD(UST, Korea), MIP(SL), CPhys(SL),

Senior Research Scientist

G D T A Pathiragoda (Mrs)
*BSc(Spl)(Hons)(Colombo)
PGD(Kelaniya), MSc(Colombo), MA*

Research Scientists

R A D S D Ranasinghe
BSc(Spl)(Hons)(Sri Jayawardenepura), Dip. In Inf. Tech(Colombo)

M D R De Costa
BSc(Sri Jayawardenepura)

L G R C Lewangama (Mrs)
BSc(Ruhuna)

K B G K I Kariyawasam (Mrs)
BSc(Spl)(Sri Jayawardenepura)

A V U A Wickramaratne (Miss)
BSc(Spl)(Sri Jayawardenepura)

Senior Research Technologist

T N P K Peiris
BSc(OU SL)

Research Technologists

S P C Padmarasha

T G N B Karunathilaka

Management Officers

R P D Vonhagt (Mrs)

ELECTRO TECHNOLOGY LABORATORY

Director- Electro Technology Laboratory/Principal Research Engineer

Dr R M Weerasinghe
BSc(Eng)(Peradeniya), MSc (AIT -Thailand), PhD

Principal Research Scientist

C M Kalansuriya
BSc(Hons)(Open University), MPhil(Colombo)
LIP(SL)

Research Engineer

R P K Wijewardena
BSc(Eng)(Moratuwa)

R M C Asanga
B Sc(Eng)(Kothalawala Defence Acd.)

Research Scientist

K A C Perera
BSc(Spl)(Hons)(Ruhuna)

Senior Research Technologist

W L D D C Jayaratne

Research Technologist

K K N Dharshana

A M A P N Alagiyawanna

PHARMACEUTICALS LABORATORY**Director, Pharmaceuticals Laboratory**

(Vacant)

Principal Research Scientist

Dr G V V Liyanaarachchi (Miss)
BSc(Spl)(Hons)(Colombo)
PhD(Colombo)

Senior Research scientist

Dr V A Agampodi
BSc(Hons)(Colombo), MIT(Colombo)
PhD(Queensland University)

S N Warnakulasuriya (Mrs)
BSc(Peradeniya), MSc(Dalho Uni Canada)
MSc (Colombo)

Research Scientist

G A D Hasantha
BSc (Colombo)

R W L N Rajapakse (Mrs)
BSc(Spl)(Colombo)

G W Widanagamage
B Sc(Spl)(Colombo)

A H F Nimara (Miss)
B Sc(Hons)(Sr Jayewardenepura)

PETROLEUM & LUBRICANT TESTING LABORATORY**Director, Petroleum & Lubricant Testing Laboratory**

(Vacant)

Senior Research Scientist

Dr G G E H de Silva (Ms)
GIC (ins.Chemisry), PhD (University of Texas)

Dr J T V C Jayawardene
B Sc (Hons)(Pradeniya), PhD(Queensland-Australia)

F N Zavahir (Mrs)
BSc(Sri Jayawardenepura), MPhil(Sri Jayawardenepura)

Research Scientist

K D M M Dissanayake (Mrs)
BSc(Ruhuna)

W A D S V Wettasinghe
BSc(Sri Jayawardenepura)

K A Nimasha (Mrs)
BSc(Ruhuna)

W K B S T Fernando (Mrs)
B Sc(Spl)(Uni. of Ruhuna)

L P P Mdhushani Mrs)
BSc(spl)(Colombo)

K Anushan
BSc(Hons)(Uni of Jaffna)

OFFICE OF THE ADDITIONAL DIRECTOR GENERAL - TECHNICAL SERVICES**Senior Customer Liaison Officer**

R A R R Perera (Mrs)
BSc (Wayamba), MBA (Kelaniya)

Customer Liaison Officer

K N Kalupahana (Mrs)
NDT (Moratuwa)

Management Officers

W M L Swarnalatha (Mrs)

A G A H Abeysinghe (Mrs)

ADMINISTRATION & OPERATIONS

FINANCE DEPARTMENT

Director - Finance

D L C A Gunaratne
MBA(Finance)(Aus), ACMA,PG Dip BM ,ACBA

Chief Accountant

Mr. D N Weerakoon
HNDA, ICASL-Infor, CMA-DIP, MBs(Colombo)

Accountant

R Malavipathirana (Mrs)
IAB(London)

Accounts Officers

L A M S P Menike (Mrs)

H A N Perera (Mrs)
AAT (Intermediate II)

P K N Dilumnika(Mrs)
DPM(Sri Jayewardanepura)

STORES

Senior Stores Officer

K L S D Perera
BA(Kelaniya)

Stores Officer

A P Edirisooriya

SUPPLIES

Senior Supplies Officer

Mr H P R Kumara
*BSc(Business Management)
(Accountancy)(Kelaniya),MSS (Colombo)*

Supplies Officers

B P N Peiris (Mrs)
DipSupMatMang

D L Gamlath (Mrs)
*BSc(Spl) Public Management (Sri
Jayawardanepura)*

W A D De Alwis (Mrs)

HUMAN RESOURCES DEPARTMENT

Director – Administration & Human Resources

D Ruwanpura
Attorney-at-Law, MLRHRM, LLB, BSc (Hons)

Senior Administrative Officers (HR)

U A Thilakasiri

BLE(Colombo)

Senior Administrative Officers (HR)

Vacant

HR Officer

W V P Sarojinie (Mrs)

Administrative Officer

L N Perera (Mrs)
Dip. (Kelaniya)

MARKETING & BUSINESS DEVELOPMENT DEPARTMENT

Director, Marketing & Business Development

N G M Wijemanne (Mrs)
*BSc(Open University), MBA(Australian Inst. of
Business Administration)*

Senior Industrial Liaison Officer

C M Ranwala (Mrs)
BSc(Sabaragamuwa),MBM(Colombo)

Senior Marketing Officer

K M D AravindBsc-Marketing (Sri Jyewardanepura)

Industrial Liaison Officer

M M D S Dharmasiri (Mrs)
BSc(Ruhuna)

Marketing Officer

N P K Wanniarachchi
BSc(Sri Jayawardanepura)

ENGINEERING SERVICES

Chief Engineer

A S Arachchi
BSc(Eng)(Moratuwa), PG (Dip)

Assistant Engineers

W H R J Jayakody
NDT, Dip. In Info. Tech (SLIT)

U I Gamhewa
NDT (Moratuwa)

OFFICE OF THE ADDITIONAL DIRECTOR GENERAL – ADMINISTRATION & OPERATION

Management Officer

A I Bandara (Mrs)

QUALITY ASSURANCE DEPARTMENT

Director - Quality Assurance Department/Principal Research Scientist

W A J Sajeewika Perera (Mrs)
BSc(Spl)(Hons)(Kelaniya), MSc(Kelaniya)

Research Scientists

H G T H Jayatunga (Miss)
BSc(Hons)(Kelaniya)

Quality Assurance Officer

P A M P Marage (Mrs)
BSc(Uva Wellassa University)

INFORMATION SERVICES CENTRE

Director-Information Services Centre / Principal Research Scientist

P M Jayasinha (Miss)
*GradIChemC, MPhil(Open University), MChemC,
CChem, ASLLA*

Senior Research Scientist

E M S Isanka (Mrs)
BSc(Spl)(Hons)(Peradeniya), MSc(Colombo)

Librarian

Vacant

Assistant Librarian

W W P N Geekiyanage (Mrs)
ASLLA

W W R L Fernando (Mrs)
ASLLA, PGD in Information Management

Management Officer

Y A R Kapurubandara (Mrs)

COMPUTER UNIT

Computer System Engineer

M R M Naseer
BSc (Jaffna)

Senior Research Technologist

N K Alagoda (Mrs)
NDT(Moratuwa)

Senior Computer System Administrator

S S Wickramasekara
BIT(Colombo), Certificate(NAITA), Certificate(NIE)

Computer System Administrator

G A M Dilshan
DIT(Colombo)

OFFICE OF THE DIRECTOR GENERAL

Institute Secretary

M K A P Gunatillake (Mrs)
*B.Sc. Business Administration (Sri Jayawardenepura)
,LLB (Open University),
MBA (Sri Jayawardenepura)*

Confidential Secretary

H H S M R Wijenayaka (Mrs)*BCom (Sri
Jayawardenepura)*

Senior Legal Officer

Vacant

CHAIRMAN'S OFFICE

Confidential Secretary

H A A U Dias (Mrs)
BCom(Sri Jayawardanepura)

INTERNAL AUDIT

Chief Internal Auditor

N K De Silva
FCA,FMAAT,ACA,ACMA

Internal Auditor

G A D A Perera
CIMA(UK)

Internal Audit Officer

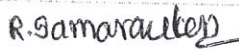
S P Haputhanthri
Nat.Dip in Finance (SLIATE)

A M Jayasinghe(Miss)
Bsc.-Management(Sri Jayewardenepura)

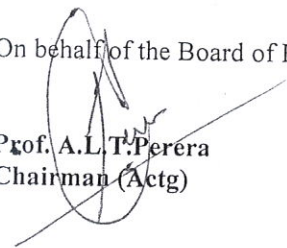
INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
STATEMENT OF FINANCIAL POSITION AS AT 31ST DECEMBER, 2021

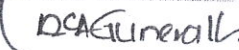
	NOTE	2021	2020
<u>ASSETS</u>			
Current Assets	3		
Cash and Cash equivalents	3D	373,419,763	426,406,001
Trade and other receivables	3B	226,120,761	256,302,577
Inventories/Stocks	3A	28,685,144	22,966,848
Prepayments	3C	7,851,333	9,846,091
		<u>636,077,002</u>	<u>715,521,517</u>
Non-current Assets			
Property, Plant and Equipment	1	1,853,031,831	1,745,803,897
Other Assets (Work-in progress)	2	337,568,382	374,455,203
Investments	3D	110,000,000	110,000,000
		<u>2,300,600,213</u>	<u>2,230,259,100</u>
Total Assets		<u>2,936,677,215</u>	<u>2,945,780,617</u>
<u>LIABILITIES</u>			
Current Liabilities	4		
Payables	4A	67,624,445	168,203,968
Accrued Expenses	4B	159,273,180	166,041,747
Provision for Gratuity	5C	2,935,315	3,217,280
		<u>229,832,940</u>	<u>337,463,044</u>
Non-Current Liabilities	5		
Payable	5A	21,755,687	19,520,122
Differed Income	5B	978,332,740	790,081,425
Provision for Gratuity	5C	129,302,470	123,152,736
		<u>1,129,390,896</u>	<u>932,754,283</u>
Total Liabilities		<u>1,359,223,836</u>	<u>1,270,217,327</u>
Total Net Assets		<u>1,577,453,379</u>	<u>1,675,563,290</u>
<u>NET ASSETS / EQUITY</u>			
	6		
Accumulated Fund	6A	761,204,463	809,130,799
Reserves - Donations	6B	662,806,487	712,990,061
Revaluation Surplus	6C	153,442,429	153,442,429
Total Net Assets / Equity		<u>1,577,453,379</u>	<u>1,675,563,289</u>

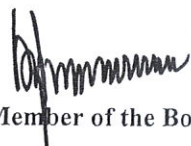
The Accounting policies on pages 05 to 07 and Notes on pages 08 to 31 form an integral part of these Financial Statement. The Board of Directors responsible for the preparation and presentation of these Financial Statements and signed on behalf of the Board of Directors.


Prof. (Mrs) J.K.R.R. Samarasekera
Director General

On behalf of the Board of Directors:


Prof. A.L.T. Perera
Chairman (Actg)


D.L.C.A. Gunaratne
Director - Finance


Member of the Board

INDUSTRIAL TECHNOLOGY INSTITUTE
STATEMENT OF FINANCIAL PERFORMANCES
FOR THE PERIOD ENDED 31ST DECEMBER, 2021

	NOTE	2021	Budget	2021	2020
Operating Revenue					
Recurrent Grant		270,000,000		279,800,000	270,333,000
Amortization of Government Grants - Depreciation	5A1	198,000,000		195,774,393	177,012,665
R & D Projects & HRD	5A1	13,000,000		45,778,725	4,133,918
Rehabilitation & Improvements	5A1	19,500,000		3,492,712	19,518,335
Income - Revenue	7A	363,815,000		320,916,112	259,342,229
- Other Income	7B	8,000,000		26,515,921	24,869,137
		872,315,000		872,277,863	755,209,284
Operating Expenses					
	8				
Personnel Emoluments	8A	432,262,000		393,765,457	382,984,490
Travelling	8B	12,000,000		7,452,123	2,024,865
Supplies and Consumable used	8C	33,286,000		37,900,030	34,768,795
Maintenance	8D	37,136,000		32,859,251	42,976,223
Contractual Services	8E	62,768,000		49,301,077	51,499,781
R & D Projects & HRD	8F	13,000,000		45,778,725	13,298,918
Depreciation	8G	198,000,000		195,774,393	177,012,665
Other Operating Expenses	8H	64,363,000		60,741,103	35,692,790
Rehabilitation & Improvements	8I	19,500,000		3,492,712	19,518,335
Disposal & write Offs				(2,466,844)	6,497,720
Damage & Losses					-
Total Operating Expenses		872,315,000		824,598,027	766,274,583
Surplus/(Deficit) from Operating Activities		-		47,679,836	(11,065,299)
Net Surplus / (Deficit) for the period		-		47,679,836	(11,065,299)

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
THE STATEMENT OF CHANGES IN EQUITY FOR THE YEAR ENDED
31st DECEMBER , 2021

	Accumulated Fund	Reserves Donations	Re-Valuation Surplus
	Rs.	Rs.	Rs.
Balance as at 01.01.2021	809,130,799	712,990,061	153,442,429
<u>Changes in Equity for 2021</u>			
Surplus for the period	47,679,836		
Shedule Adjustment	9,393,828		
Donation received during the year		139,119	
Amortization of Non - Current		(50,322,692)	
Addition Capital Grant-2020	(105,000,000)		
Balance as at 31.12.2021	761,204,463	662,806,487	153,442,429

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
CASH FLOW STATEMENT FOR THE YEAR ENDED 31ST DECEMBER, 2021

	2021 (Rs.)	2020 (Rs.)
Cash Flow From Operating Activities		
Operating Surplus/(Deficit)	47,679,836	(11,065,299)
<u>Adjustment for</u>		
Depreciation / Amotization	195,774,393	177,012,665
Profit/Loss on Property Disposal		
Gratuity Provision	12,994,976	22,350,655
Incentive Provision	14,001,387	17,810,364
Provision for Audit Fee	1,580,400	1,536,000
Interest on Investments	(18,721,021)	(19,386,234)
Bad Debts Provision	27,227,815	29,694,658
Capital Grants Amortized	(245,045,830)	(200,664,918)
Operating Surplus/(Deficit)	35,491,957	17,287,892
<u>Change in Working Capital</u>		
(Increase)/Decrease in Investments		
(Increase)/Decrease in Inventories	(5,718,297)	2,177,042
(Increase)/Decrease in Debtors	30,181,816	(63,532,618)
(Increase)/Decrease in Prepayments	1,994,757	4,508,300
(Decrease) /Increase in Payables-Non Current	2,235,565	(73,150,186)
(Decrease) /Increase in Payables-Current	(100,579,522)	(27,059,024)
(Decrease) /Increase Accrued Expenses	(6,768,567)	(8,053,251)
Cash Generated from operating Activities	(43,162,291)	(147,821,846)
Gratuity & Incentive Paid	(24,699,138)	(57,951,346)
Net Cash Flow From Operating Activities	(67,861,429)	(205,773,192)
<u>Cash Flow From Financing Activities</u>		
Capital Grants Received	278,116,464	105,000,000
Interest Received	14,378,140	20,928,013
Net Cash Flow From Financing Activities	292,494,604	125,928,013
<u>Cash Flow From Investing Activities</u>		
Acquisition of Property Plant & Equipment - Purchases	(283,612,272)	(284,042,583)
Other Assets (Work In Progress)	5,992,859	293,183,418
Net Cash Flow From Investing Activities	(277,619,413)	9,140,835
 Net Cash Flow	 (52,986,238)	 (70,704,344)
 Cash as at beginning of the year	 266,180,001	 336,884,345
Deposits below 03 months beginning of the year	160,226,000	160,226,000
Cash at the end of the year (Note - 22)	373,419,763	426,406,001

ACCOUNTING POLICIES AND SIGNIFICANT EVENTS – 2021

1. GENERAL

The Statement of Financial Position as at 31.12.2021 and the related Financial Statements have been prepared on the historical cost convention, in accordance with the Sri Lanka Public Sector Accounting Standards.

Retirement benefits to employees are provided according to the laid down statutory requirements. Institute's contribution for Provident Fund and Employees' Trust Fund is 15% and 3% respectively. Gratuity Provision is made according to the Gratuity Act No. 12 of 1983. This provision is not externally funded.

2. BASIS OF PREPARATION

The financial statements have been in accordance with the Sri Lanka Public Sector Accounting Standards for the year ended 31st December 2021.

3. ACCOUNTING FOR GOVERNMENT GRANTS

- A. Recurrent Grant from the General Treasury has been recognized as revenue in the statement of financial performance. Since year 2003 Capital Grant has been shown under deferred income in conformity with the formats specified in Circular No. PED/19. Depreciation for the year is funded by amortizing the following.

Fund	Depreciation for the year
Differed Income	Non-Current Assets acquired after 2003
Government Grant - Capital	Non-Current Assets acquired before 2003
Donation & Grants	Non-Current Assets relating to Donations

4. ASSETS - BASIS OF THEIR VALUATION

4.1 Fixed Assets

Funds for acquisition of Fixed Assets are provided by the General Treasury.

Fixed Assets have been shown at cost, less depreciation. Assets are depreciated at the following rates:

Buildings	5%
Land Improvement	5%
Plant and Machinery	10%
Office Equipment and Furniture	5%
Vehicles	20%
Computers	33 1/3%
Library Books and Journals	5%
Software and Other Assets	33 1/3%

Depreciation in respect of motor vehicles, computers and software was 10% before the 1st of January 1999 and was revised to 20% and to 33.33% respectively after that date.

Depreciation is charged from the date of purchase until the date of disposal.

Fully Depreciated Assets value as at 31.12.2021 is. Rs.878,546,346/-

4.1.1

Assets received as donations or purchased with Government Grant are amortized at the rates of depreciation referred above.

4.2 Debtors

Debtors and other recoverable are stated at the value estimated to be realized. The debtors consist of sundry trade debtors, SVAT debtors and the debts of ex-employees who are in breach of bonds and agreements.

4.3 Stocks

Stocks are shown at the Book Value. Stock issues are valued at the simple average basis.

4.4 Savings Bank Deposit Account

As per instructions given by Ministry of Finance & Policy Planning Fidelity Bonds invested with the Bank of Ceylon for Provision for Gratuity and 06 months Personal Emolument Cost. Fund Deposits for 06-month period are shown as other assets. Interest for above has been taken in to the income.

4.5 Deposits on accounts of Gratuity Provision

As per the statutory requirement an amount of Rs. 100 Million is kept in deposit account to meet the Gratuity obligations. This deposit is keeping according to PED Circular No.56 Interest for above has been taken in to the income.

4.6 Crown Land

The Land occupied by the institute (Colombo Premises) is referred as Crown land and belongs to the state. Land at Malambe belongs to the Institute.

5. Liabilities and Provisions

Current Liabilities are those which fall due for payments on demand or within one year from the Balance Sheet date.

5.1 Funds for ITI Chairman's Science Award Fund

This fund is externally invested.

6. Income and Expenditure Account

Income and Expenditure are based on accrued accounting basis.

7. Provision for Doubtful Debts

Full provision for doubtful debts is made on out standings of Trade Debtors for more than one year. However in cases of specific debts where it is considered that a higher provision is prudent such additional provision has also been made.

8. Provision on Gratuity

The provision on gratuity is made after completion of one year of service.

9. Long Term Research and Development

There are more than 60 Research & Development Projects in progress which are funded by the general treasury. Apart from Treasury Grants there are funded projects sponsored by local agencies such as National Science Foundation (NSF) and National Research Council (NRC).

10. Vidhatha program/ Exhibitions

During the year under review number of employees of ITI participated in the Vidhatha Program & Exhibitions conducted by the Ministry of Science, Technology & Research.

**Schedule on Buildings, Plant Machinery & Lab Equipment, Furniture Fittings, Vehicles, Computer Equipment
Library Books & Journals , Software & Other Assets as at 31.12.2021**

NON -CURRENT ASSETS

NOTE - 01

	Land	Land Improvement 5%	Buildings 5%	MRDC Building 5%	Plant Mach. & Lab Equip. 10%	Furni. Fittings & Office Equi. 5%	Vehicles 20%	Computer Equipment 33.33%	Library Book & Journals 5%	Soft Ware & Accessories 33 1/3%	Other Assets 33 1/3%	TOTAL
Cost												
Balance as at 01.01.2021	83,711,424	146,907,523	307,489,884	889,143,459	1,393,856,360	90,927,029	122,804,891	84,742,670	84,480,368	49,058,426	4,512,594	3,257,634,628
Additions -												
Purchases	-	-	24,094,292	-	250,584,087	1,653,016	-	6,432,971	169,364	678,543		283,612,272
Donations				-	-	-	-	-				-
Donations - TG					17,390,056			-	-			17,390,056
Re-Valuation			-			-	-			-		-
Less:												
Write - Off					-	-		-				-
Adjustment			-		-		-	-		-		-
Balance as at 31.12.2021	83,711,424	146,907,523	331,584,176	889,143,459	1,661,830,503	92,580,045	122,804,891	91,175,640	84,649,732	49,736,969	4,512,594	3,558,636,956
Less :												
Depreciation												
Balance as at 01.01.2021		6,600,776	177,910,496	206,078,928	782,800,851	35,815,394	100,671,470	80,360,605	69,228,841	47,850,777	4,512,594	1,511,830,732
Add:												
Depreciation for 2021		7,345,376	14,365,925	44,457,173	101,526,357	3,764,959	14,970,960	6,515,284	1,651,233	1,177,127		195,774,393
Less:												
Re-Valuation							-					-
Disposal					-	-		-				-
Adjustment			(2,000,000)		-			-				(2,000,000)
Balance as at 31.12.2021	-	13,946,152	190,276,421	250,536,101	884,327,208	39,580,353	115,642,430	86,875,889	70,880,074	49,027,904	4,512,594	1,705,605,125
Balance as at 31.12.2021	83,711,424	132,961,371	141,307,756	638,607,358	777,503,295	52,999,692	7,162,461	4,299,752	13,769,659	709,065	-	1,853,031,831

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT OF FINANCIAL POSITION AS AT 31ST DECEMBER 2021

	2021	2020
	Rs.	Rs.
<u>Other Assets (work in progress) - (Note - 2)</u>		
Modern R & D Complex, Malambe	315,718,597	313,709,404
Treasury Grant Projects	21,849,785	60,745,799
	<u>337,568,382</u>	<u>374,455,203</u>

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT OF FINANCIAL POSITION AS AT 31ST DECEMBER 2021

	NOTE	2021 Rs.	2020 Rs.
<u>Current Assets (Note - 3)</u>			
<u>Consumable Stores</u>			
Chemical		13,086,473	6,448,122
Laboratory Ware		10,197,751	11,984,622
Mis. Supplies		443,522	496,424
Electronic Components		6,013	6,013
Stationery		1,267,183	855,630
Industrial Gases		190,402	99,109
Toners & Cartridges		3,493,800	3,076,928
	(Note - 3A)	28,685,144	22,966,848
Purchase Advances - Local Supplies	15A	7,168,858	19,784,583
Purchase Advances - Foreign Supplies	16	44,472,176	21,222,203
Sundry Debtors	17	49,007,684	40,587,772
VAT Receivable			-
VAT Receivable from Inland Revenue		34,861,120	34,861,120
Receivable from BOC (Donation)			-
Welfare Receivable		1,003,250	806,250
Provision for Welfare receivables		(806,250)	(806,250)
Receivable from STC - Hand Sanitizer Project		26,593,192	27,929,826
Trade Debtors	18A	8,105,714	15,950,457
Staff Advances	20	40,188,254	36,549,719
Deposits	21	5,242,454	5,042,454
Funded Projects	23	9,343,290	53,433,451
Obsolete Assets for Disposal		941,019	941,019
	(Note - 3B)	226,120,761	256,302,577
Pre-payments	(Note - 3C)		
Fidelity Bonds (LCs), Gratuity Obligation & Reserve for Working Capital (Over 06 months)	19	7,851,333	9,846,091
		110,000,000	110,000,000
Fidelity Bonds (LCs), Gratuity Obligation & Reserve for Working Capital		160,226,000	160,226,000
Cash & Bank Balance	22	213,193,763	266,180,001
	(Note - 3D)	373,419,763	426,406,001

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT OF FINANCIAL POSITION T AS AT 31ST DECEMBER 2021

		NOTE	2021 Rs.	2020 Rs.
<u>Current Liabilities (Note - 4)</u>				
Trade Creditors		18B	14,509,024	6,103,852
Sundry Creditors		15B	20,987,394	88,110,384
Tender & Security Deposits		24	787,695	787,695
VAT Payable			2,865,701	4,066,757
Staff Group Medical Insurance Empolyee Control A/C			767,374	1,485,335
Funded Projects		23	27,707,258	67,649,918
	(Note - 4A)		67,624,445	168,203,968
Accrued Expenses	(Note - 4B)	25	124,412,060	131,180,626
Provision for VAT Receivable			34,861,120	34,861,120
Provision for Gratuity	(Note - 5C)	26	2,935,315	3,217,280
<u>Non-Current Liabilities</u>				
Provision for Gratuity	(Note - 5C)	26	129,302,470	123,152,736
Reserves - Bond Defaulters			17,252,487	16,907,162
Science Award Fund (Originated by Prof. Vijaya Kumar)			393,445	393,445
Staff Activity Fund			4,089,689	2,199,449
Kasper Unit Fund			20,065	20,065
	(Note - 5A)		21,755,687	19,520,122

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO FINANCIAL POSITION AS AT 31.12.2021

		2021		2020	
<u>Amortization of Government Capital Grants (5A1)</u>		Rs.	Rs.	Rs.	Rs.
<u>(A/C - 604440-70700)</u>					
Depreciation	:- Non-Current Assets Upto 2002				
	Non-Current Assets 2003 Onwards	145,593,820		127,845,193	
	Non-Current Assets Donated	50,180,573	195,774,393	49,167,472	177,012,665
R & D Projects & HRD	:- Treasury Granted	40,483,141		740,519	
	Research & Development	114,130		306,530	
	Membership fee	60,000		1,492,450	
	Quality System Improvement & Silpasena	5,121,454		1,594,419	
	R & D Expenditure		45,778,725		4,133,918
Rehabilitation	:- Building & Structure	3,019,727		18,497,543	
& Improvement	Plant Machinery and Equipment	448,500		1,020,792	
	Improvement of Vehicles				
	Improvement of Other Capital Assets	24,485	3,492,712		19,518,335
			<u>245,045,830</u>		<u>200,664,918</u>

Differed Income (Note - 5B)

Government Contribution - Capital - 2003 Onwards)

(A/C - 300102 & A/C - 300104)

Balance as at 01.01.2021	790,081,425		941,578,871	
Capital Grant for ITI	383,116,571	1,173,197,996		941,578,871
Amortization (Depreciation of Non-Current Assets)	(145,593,820)		(127,845,193)	
Amortization (Research & Development- Accreditation)	(114,130)		(306,530)	
Amortization (Treasury Granted Project Expenditure)	(40,483,141)		(740,519)	
Amortization (Rehabilitation Expenditure)	(3,492,712)		(19,518,335)	
Amortization Membership Fee	(60,000)		(1,492,450)	
Amortization Quality System Improvement & Silpa Sena	(5,121,454)		(1,594,419)	
Amortization R & D Expenditure		(194,865,257)		(151,497,446)
Balance as at 31.12.2021	<u>978,332,740</u>		<u>790,081,425</u>	

Accumulated Fund (Note - 6A)

Government Contribution Capital - Upto 2002 and
Income & Expenditure Account Balance)

(A/C - 300101-30000 & A/C - 300300-30400)

	2021		2020	
	Rs.	Rs.	Rs.	Rs.
Government Contribution Capital Upto 2002 - 01.01.2021	724,826,595		619,826,595	
Income & Expenditure Account - 01.01.2021	84,304,203		76,567,767	696,394,362
Additions during the year- Capital Grant for ITI	278,116,464		105,000,000	105,000,000
Capital Grant for ITI trf to Differd Income	(278,116,464)			
Capital Grant for ITI (2020) trf to Differd Income	(105,000,000)	704,130,799		18,801,735
Schedule Adjustment		9,393,828		
Surplus (Deficit) for the period of 2021	47,679,836		(11,065,299)	
Balance as at 31.12.2021	<u>47,679,836</u>	<u>761,204,463</u>	<u>(11,065,299)</u>	<u>809,130,799</u>

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)

DONATIONS AND GRANTS AS AT 31ST DECEMBER, 2021

NOTE - 6B

Donations	A/C No.	Balance 01.01.2021	Additions during the year	Amortizations during the year	Balance 31.12.2021 Rs
Other Donation	300204	26,536		26,536	(0)
Capital Reserves	300205	1,523,209			1,523,209
ADB Donation	300207	2,244,332		1,122,166	1,122,166
Gift from JICA - FP 42	300213	14,748		7,374	7,374
Gift from MHIM - FP 36	300214	1,183		592	592
Gift from CARP FP 48	300215	900		450	450
Gift from TVEC	300219	5,828		2,914	2,914
Japanese 2KR Project	300222	14,516		1,731	12,785
NSF - Accessories to SEM	300228	-			-
Common Fund commodities	300231	89,375		8,938	80,438
Treasury Grant Vehicle Cab (MOTR)	300232	-			-
Donation to BTU	300234	391,876		195,938	195,938
Gift from Lion Brewery	300237	4,478,736		1,120,451	3,358,284
NRC Waters-HPLC	300238	1,612,877		350,000	1,262,877
NSF Donation	300239	263,957		52,791	211,165
Dept. of Ayurveda	300240	21,250		4,250	17,000
2KR Japanies Counterpart fund	300241	665,003,085		41,562,693	623,440,392
NSF FP 99	300242	264,625		37,804	226,821
Gloria Mundi Energy Institute FP 112	300243	102,865		14,695	88,170
Korean Institute of Ocean Science Technology FP 117	300244	44,081		6,297	37,784
NSF FP 113	300245	263,297		37,615	225,682
NRC-FP 106	300246	1,197,413		119,741	1,077,672
NRC-FP 111	300248	1,615,775		164,578	1,451,198
CIDA - IDRC Project	300403	15,309,597		3,496,021	11,813,577
Ministry of Trade	300404	18,500,000		1,850,000	16,650,000
Physikalisch Technische	300405		139,119	139,119	-
TOTAL		712,990,060	139,119	50,322,692	662,806,487

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
REVALUATION BALANCE AT AT 31.12.2021

Note -6C

	2021	2020
	Rs.	Rs.
2008 Re-Valuation		
Plant Mach. & Lab Equipment	26,950,099	26,950,099
Furni. Fittings & Office Equip.	6,404,627	6,404,627
Computer Equipment	(7,197,654)	(7,197,654)
	26,157,073	26,157,073
2009 Re-Valuation		
Buildings	102,685,357	102,685,357
	128,842,430	128,842,430
2016 Re-Valuation		
Vehicles	24,600,000	24,600,000
	153,442,430	153,442,430

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT OF INCOME
FOR THE REPORTING PERIOD ENDED 31ST, DECEMBER 2021

	2021		2020	
<u>Revenue (Note - 7A)</u>	Rs.	Rs.	Rs.	Rs.
Standard Services	171,988,360		148,244,004	
Less: Refund	636,452	171,351,908	323,038	147,920,966
Consultancy Service		29,542,784		25,404,178
Technology Transfer		13,091,686		11,485,600
Contract Projects	15,842,828		18,613,729	
Less:-Sub Contract Projects	-	15,842,828	6,000	18,607,729
Customised Services		25,265,219		16,397,612
Training		4,552,095		10,725,524
Royalty Received		24,370		933,650
Hand Sanitizer Project		61,245,222		27,866,970
		320,916,112		259,342,229
<u>Other Income (Note - 7B)</u>				
<u>Other Operating Income</u>				
Income-Library	61,545		96,385	
Income - Other / General	6,229,521	6,291,066	4,405,594	4,501,979
<u>Other Non Operating Revenue</u>				
Interest on Staff Loan	1,256,228		874,450	
Interest on Investments (Working Capital, Gratuity, LC Deposit)	18,721,021		19,386,234	
Exchange Gain & losses	247,607		106,474	
		20,224,855		20,367,158
		26,515,921		24,869,137

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)

NOTES TO STATEMENT OF INCOME

FOR THE REPORTING PERIOD ENDED 31ST, DECEMBER 2021

	2021	2020
<u>Personnel Emoluments (Note - 8A)</u>	<u>Rs.</u>	<u>Rs.</u>
Salaries & Wages	288,869,264	268,117,509
Casual Wages	2,943,300	2,933,113
R & D Allowances	16,160,348	18,458,511
Employee Provident Fund	37,074,856	35,531,682
Employee Trust Fund	7,414,971	7,119,175
Gratuity	13,014,576	22,350,655
Overtime	9,307,307	6,733,040
Honorarium - G.B. Members	888,472	617,740
Medical Reimbursement	253,132	485,823
Incentive (PBIS)	6,400,000	5,176,056
Incentive (PF-380)	7,601,387	11,430,364
Staff Group Medical Insurance	3,837,844	4,030,823
	<u>393,765,457</u>	<u>382,984,490</u>

Travelling (Note - 8B)

Travelling - Local	779,886	959,094
Travelling - Foreign	-	2,568
Travelling - Pool Transport	6,672,237	1,063,203
	<u>7,452,123</u>	<u>2,024,865</u>

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT INCOME
FOR THE REPORTING PERIOD ENDED 31ST, DECEMBER 2021

	2021	2020
<u>Supplies and Consumable used (Note - 8C)</u>	Rs.	Rs.
Chemicals	11,453,165	12,525,284
Labware	10,785,906	8,586,127
Electronic Components	60,782	154,455
Stationery	4,433,841	4,029,933
Other Supplies	1,230,048	1,091,354
Other / CRR	104,617	228,914
Safety Measures	963,052	1,032,708
Uniforms - Watchers, Drivers, Etc.	1,190,718	914,895
Welfare Including Sports	6,225	83,463
Fuel Charges	7,671,676	6,121,663
	37,900,030	34,768,795

Maintenance (Note - 8D)

Buildings & Premises	13,180,802	15,104,067
Plant & Machinery	6,380,595	15,705,590
Furniture & Equipments	2,011,541	1,872,266
Library Books	-	241,525
Laboratory ware	12,670	20,784
Computer	5,114,244	4,227,638
Canteen	67,840	18,500
Generator	567,053	364,017
Vehicles	5,524,506	5,421,836
	32,859,251	42,976,223

Contractual Services (Note - 8E)

Electricity charges	24,071,387	27,006,137
Telephone & Internet charges	9,077,393	10,738,428
Postage Expenses	298,901	343,676
Rate & Taxes	2,023,560	2,023,560
Security Services charges	12,982,487	10,283,223
Water charges	847,350	1,104,757
	49,301,077	51,499,781

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT INCOME
FOR THE REPORTING PERIOD ENDED 31ST, DECEMBER 2021

	2021	2020
	Rs.	Rs.
<u>Projects & HRD (Note - 8F)</u>		
TG Expenditure	40,483,141	740,519
Research & Development (Accreditation)	114,130	306,530
Membership Fee	60,000	1,492,450
Library Science Directory Annual Sub	-	9,165,000
Quality System Improvement	5,121,454	1,594,419
	45,778,725	13,298,918

Depreciation & Amortisation Expenses (Note - 8G)

Buildings	58,823,097	58,450,201
Land Improvement	7,345,376	6,600,776
Plant & Machinery	101,526,357	79,291,432
Furniture & Equipments	3,764,959	3,745,664
Computers	6,515,284	9,771,501
Vehicles	14,970,960	15,930,960
Software	1,177,127	1,389,181
Library Books	1,651,233	1,832,948
	195,774,393	177,012,665

Rehabilitation Expenditure (Note - 8I)

Rehabilitation of Building and Structures	3,019,727	18,497,543
Rehabilitation of Plant Machinery and Equipments	448,500	1,020,792
Rehabilitation of Improvement of Other Capital Assets	24,485	
	3,492,712	19,518,335

INDUSTRIAL TECHNOLOGY INSTITUTE (SUCCESSOR TO CISIR)
NOTES TO STATEMENT INCOME
FOR THE REPORTING PERIOD ENDED 31ST, DECEMBER 2021

	2021	2020
<u>Other Operating Expenses (Note - 8H)</u>	Rs.	Rs.
Staff Training Expenses	8,400	89,700
Sampling Charges	6,589,072	3,347,275
Subsistence charges	2,475,750	1,766,975
Subscription Expenses - Local / Foreign/Other	207,217	160,591
Laboratory Membership Fee (Local)	172,000	-
Honorarium Expenses	1,084,633	622,812
Medical Examination Fee (New Recruits)	144,360	114,000
GPRS Tracking System	500,158	
Entertainment Expenses	502,143	114,714
Insurance Expenses	2,924,616	1,882,682
Printing Charges	572,053	382,240
News Papers & Subs.	204,064	126,796
Audit Fees	1,580,400	1,536,000
Out source Employees' Salary	691,668	618,930
Legal Fee	222,980	125,000
Bank Charges	207,844	84,283
Credit Card Commission	227,655	143,047
Advertising	1,693,175	883,644
Publication - Annual Reports	116,490	121,425
Promotional & Publicity	1,506,328	7,430
Disallowed VAT	1,800	1,410,745
Techno Centre Expenses	189,759	-
Survey Fee - Board of Survey	232,685	168,725
Incidental Expenses	4,273	-
Patency & Consultancy Fee	16,675	289,570
Expenditure- Standard Services	1,926,700	549,971
Expenditure -Consultancy Services	1,399,218	756,745
Expenditure -Technology Transfer	343,598	545,155
Expenditure -Contract Project	164,313	1,356,603
Expenditure -Sub Contract Work	202,107	-
Expenditure -Customised Services	582,534	299,032
Expenditure -Training	170,276	612,106
Expenditure_ Hand Sanitizer	31,460,977	16,025,214
R & D & TS General Expenditure	81,548	65,374
NVQ Level - 4 Certificate Course.	287,638	134,993
Clearing Charges	710,152	22,332
Annual Research Symposium R & D	860,429	-
Exhibition Expenses (ITI)	4,142	532,628
Exhibitions / Vidhatha/ Ministry works	-	295,171
Exhibition"Shilpa Sena"	-	344,646
Stamp Duty	83,480	58,800
Provident Fund Stationeries	93,164	74,751
Miscellaneous Expenditure	294,629	22,684
	60,741,103	35,692,790

Report of the Auditor General as per the Section 12 of the National Audit Act No 19 of 2018 on the Financial Statements of Industrial Technology Institute for the year ended on 31st December 2021 and other legal and regulatory requirements.

1 Financial Statements

1.1 Qualified Opinion

The audit of the financial statements of the Industrial Technology Institute for the year ended 31 December 2018 comprising the statement of financial position as at 31 December 2021 and the statement of changes in equity and statement of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information, was carried out under my direction in pursuance of provisions in National Audit Act No 19 of 2018 and Finance Act No 38 of AND 1971 No 38 which should be read with the Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka. My report will be tabled at Parliament in due course in line with Article 154 (6) of the Constitution.

My Report, except the effect incurred by the matters described in the Basis for the Qualified Opinion, envisages my opinion that the financial position as at 31st December, 2021 financial operation for the year ended as at 31st December, 2018 and cash flows reflect a true and fair position in accordance with the Sri Lanka Public Sector Accounting Standards (SLPSAS).

1.2 Basis for the qualified opinion

(A) Even though the cost of the stocks are to be calculated using either First in First Out (FIFO) Method or Weighted Average Cost And Method (WAC as per para 09 (35) of Sri Lanka Public Sector Accounting Standards, it has not been followed and the institute has used simple average cost method to evaluate and account the stocks for Rs. 28,685,144 as at 31st December 2021.

(B) According to Sri Lanka Public Sector Accounting Standard No. 03, the effective life of the assets should be correctly identified and the correction of the accounting estimates should be made, but the effective life of the fixed assets with the value of Rs. 878,546,346, which was fully depreciated but still in use, was not reviewed and included in the financial statements.

(c) In the cash flow statement, the value of laboratory equipment amounting to Rs.225,234.41 which was purchased in the previous years and transferred between the asset accounts in the reviewed year, which was not in accordance with the terms mentioned in the Sri Lanka Public Sector Accounting Standard No. 02, was stated as an expenditure of money in the reviewed year.

(d) Unrecognized direct bank credits as at 31st December 2021 amounting to Rs.12,897,354 were shown in the financial statements under current liabilities as expenses to be paid without taking steps to identify them in the year under review.

(e) As of December 31, of the year under review, the debtor balance is Rs.11,124,306 as per the debtor time analysis, but in the financial statements (accounts) note 18A) the debtor balance is shown as Rs.15,718,055, so the debtor balance in the debtor time analysis and the financial statement shows a difference of Rs. 4,593,749/- However, the changes were not checked and reconciled in the financial statements.

(f) At the time of depositing the money by the customers through online method for providing services from the institution and when submitting the original copies of the deposit receipts to the institution, the same transaction is double recorded in the ledger and therefore the debtor balance is shown less by Rs.7,602,974 and the cash balance is shown more than that value in the financial statements. Accordingly, the bank reconciliation had been prepared entering the said amount was entered in the Bank Reconciliation Statement as uncleared deposits.

(g) As of the last day of the year under review, the total amount of Rs.8,039,067 shown in the financial statements as balances due from 03 to 16 years was not submitted to the audit to verify the balances, so it could not be audited satisfactorily during the liability audit.

(h) In August 2019, the value of 19 laboratory equipment received by the Institute's Packing Material Lab through UNIDO Grant was not included in the financial statements and fixed assets register, and the equipment was excluded from the depreciation process. The information required to verify the value of these high-value equipment was not submitted to the audit.

1.3 Other information included in the Annual Report 2021 of the Institution

Information included in the Annual Report 2021, but not included in the Financial Statements which are to be produced to me later and the information not included in my audit report in that regard are intended by the term Other Information. The Management is responsible of this other information.

My opinion on the financial statements do not cover the other information and I do not provide my opinion or certification on the same.

In relation to my audit on financial statements, my responsibility is to read the other information when available and to consider whether the other information comply with the financial statements and whether there is any quantitative mismatch as per my knowledge gained at the audit or by any other means.

When the annual report 2020 is read, if I conclude that there is any quantitative misrepresentation, the matters should be forwarded and communicated to the parties involved. If there are further misrepresentations, I may include them in the report tabled at the Parliament as per section 154 (6) of the Constitution.

1.4 The Responsibility of the Management and the Parties in control over Financial Statements

It is the responsibility of the Management for preparing and fair presentation of these Financial Statements in accordance with the Sri Lanka Public Sector Accounting Standards and to determine the internal control required for preparing the Financial Statements free of quantitative error statements which might occur due to frauds and defaults.

In preparing the Financial Statements, it is the responsibility of the Management to decide the sustainability of the company. And, unless the Management is of the view to liquidate the company or to terminate the operations in the absence of any other alternatives, it is also a responsibility of the Management to disclose the matters pertaining to book keeping and the going concern of the company.

The parties in control are vested with the responsibility on the Financial Reporting process of the Institution

In terms of subsection 16(1) of the National Audit Act, No.19 of 2018 books and reports on income, expenditure, assets and liabilities must be duly maintained enabling to prepare the annual and periodical Financial Statements of the Authority.

1.5 The responsibility of the Auditor on auditing of Financial Statements

It is my target to provide a fair confirmation that the Financial Statements in whole, are free of quantitative erroneous statements which occur due to frauds and defaults, and to issue the auditor's report inclusive of my opinion. Even though fair confirmation amounts to that of high standard, it may not confirm that the same will always expose the quantitative misstatements when carrying out the audit in terms of the Sri Lanka Audit Standards. The quantitative misstatements may occur due to the individual or collective frauds and defaults and it is anticipated that the same may cause effect on the economic decisions taken up by those who make reference of it based on these Financial Statements

I carried out this audit with professional edict and doubt, in accordance with the Sri Lanka Audit Standards. Further,

In order to avoid the risks which occur due to frauds and defaults by scheduling appropriate audit criteria as and when required in recognition and valuation of the risks of quantitative erroneous statements which may occur in the Financial Statements due to frauds and defaults, the receipt of sufficient and suitable audit evidence provides a basis for my opinion. The impact of a fraud is more powerful than the same generated out of quantitative erroneous statements. Corrupt association, preparing forged documents, intentional ignorance or avoidance of internal controls cause fraud.

Even though an understanding on the internal control was perceived to schedule audit criteria as timely required, it is not expected to express a view on the productivity of internal control.

Assessment of the fairness in the accounting policies and estimates used and the appropriateness of the related revelations by the Management.

The relevance of the use of the basis of sustainability of the Institute for accounting purposes was decided on the audit evidence obtained as to whether there exists a quantitative inconsistency on the sustainability of the Institute due to incidents and circumstances. In case I assume that there exists a sufficient inconsistency, attention should be paid to the disclosures on same in the Financial Statements, and if such disclosures are insufficient my opinion should be modified. However, the going concern may terminate on incidents or circumstances in future.

The presentation of Financial Statements inclusive of disclosures, structure and content were evaluated and the evaluation to the effect that the transactions and incidents affecting the same in an appropriate and fair manner.

The parties in control were apprised of the important audit findings, major internal control weaknesses and other matters recognized during my audit.

2.The Report on other legal and regulatory requirements

2.1 Special provisions have been incorporated in the Audit Act, No.19 of 2018 on the following requirements:

2.1. 1 In terms of the requirements provided in section 12(a) the National Audit Act, No.19 of 2018, all information and explanations required for the audit, except the impact caused by the matters described in the part basis for the quantified opinion in my Report, were obtained by me, and in view of my investigation, the Institute had maintained proper financial records.

2.1. 2 In accordance with the requirement provided in section 6(1) (d) (III) of the National Audit Act, No.19 of 2018, the Financial Statements of the Institute are consistent with the preceding year.

2.1. 3 2.1.3 In accordance with the requirement provided in section 6(1) (d) (iv) of the National Audit Act, No.19 of 2018, the recommendations made by me in the previous year except the matters referred to in paragraph (b) of this report, have been incorporated in the Financial Statements so presented.

2.2 No matter was encountered to declare the following, based on the action taken and evidence obtained, and within the limitations of quantitative matters.

2.2.1. As per the requirement in section 12 (e) of the National Audit Act, No.19 of 2018, that except the following observations, action has been taken not in compliance with any applicable written laws or other general or special orders issued by the governing body of the Institute.

2.2.2 Failure to comply with any applicable law or any other general or special provisions issued by the governing body of the institution than the following observations as required by Section 12 (f) of No 19 Audit Act No. 19 of 2018

Reference to the laws and rules/provisions	Description
(a) Section 507(2) of Sri Lanka Financial Regulations	As on 31st December, every fixed asset should be checked for existence or not and their status should be recorded Although a statement of these assets should be prepared and submitted to the Auditor General along with the annual accounts, the institute had not done the survey for the year 2021 and by August 2022, which was the date of the audit.
(b) Section 3.1 of the Public Administration Circular 30/206 dated 29th December 2016 and Form General 267	The fuel consumption of the vehicles should be checked after 12 months from the previous check or after completing the mileage of 25,000 KM or after a major repair to the engine, whichever occurs first and the running

charts should be maintained accordingly. Further the date of the check, distance driven per liter and the signature of the officer who conducted the check should be included in the log book relevant to the fuel check. However, no such entry has been entered into the 22 log books checked during the audit.

2.2.3 As per the requirement in section 12 (g) of the National Audit Act, No.19 of 2018, action has not been taken in compliance with the powers, functions and duties of the institution.

2.2.4. As per the requirement in section 12 (h) of the National Audit Act, No.19 of 2018 institution resources have not been procured and utilized economically, efficiently and effectively within the time frames and in compliance with the applicable laws.

(a) The Programmable Fluid Bath device worth Rs. 1,763,040, which can be used to maintain the temperature of the Resistor device, was entered into the fixed asset register on September 04, 2002 and was in the Electronic Research Laboratory, but since 2006, it was unused and kept idle.

(b) It was observed that 3,627 square feet office space and 57 office and laboratory wooden equipment in the main building located in the Torrington premises of the Institute of Industrial Technology have been idle since 2017.

2.3 Other Matters

(a) The amount of Rs. 14,535,683, which is 1 to 7 years old in the receivable balance, was not recovered during the year under review and the amount of Rs. 17,074,754 due from 21 officials who violated the terms of the foreign scholarship agreements was not recovered as at 31st December 2021.

(b) 04 bank accounts with the value of Rs.2,448,085 had been maintained as inactive bank accounts for over 06 years, and the money had not been invested.

(c) A modern pharmaceutical laboratory accredited including GLP status with facilities at the same level as advanced pharmaceutical laboratories in developed countries has been in operation at the institute since 2019 with an expenditure of Rs. 99,423,972 from the treasury allocations, but The Drug Regulatory Authority including the hospital system had not taken steps to obtain the services of the said laboratory to procure and distribute medicine. Therefore, it was observed that this laboratory is not being used as an independent accredited third party laboratory for the development of the pharmaceutical sector in Sri Lanka, which was the main purpose of establishing the laboratory. Furthermore, its main objectives, which were to become a locally/internationally recognized center of excellence for drug analysis, to solve national problems related to the quality of drugs and to strengthen local regulations and guidelines of drugs, were not fulfilled.

(d) The Petroleum and Lubricant laboratory which was established as per the decision of the cabinet of Ministers dated 31st August 2016, spending an amount of Rs. 117.7 million in accordance with the PUCSL to carry out third party checks of petroleum products, it was observed that the basic tasks of establishing the laboratory have not been accomplished because a system for receiving petroleum samples has not been established.

Report of the Auditor General as per the Section 12 of the National Audit Act No 19 of 2018 on the Financial Statements of Industrial Technology Institute for the year ended on 31st December 2021 and other legal and regulatory requirements.

No	Matters in the Report of the Auditor General	31.12.2021 Explanation of the Institute
01	Financial Statement	
(a)	Even though the cost of the stocks are to be calculated using either First in First Out (FIFO) Method or Weighted Average Cost And Method (WAC as per 09 (35) of Sri Lanka Public Sector Accounting Standards, it has not been followed and the institute has used simple average cost method to evaluate and account the stocks for Rs. 28,685,144 as at 31st December 2021.	In the existing computer system, the simple average method is used for the stock audit as there are no necessary facilities to carry out the stock audit according to the average cost. The new computer system with this facility has been installed at present. From the year 2022, the stock audit can be done using the average method.
(b)	According to Sri Lanka Public Sector Accounting Standard No. 03, the effective life of the assets should be correctly identified and the correction of the accounting estimates should be made, but the effective life of the fixed assets with the value of Rs. 878,546,346, which was fully depreciated but still in use, was not reviewed and included in the financial statements.	Although fully depreciated, but currently used assets should be revaluated, it has become difficult revalue the assets due to the practical difficulties (the services of technical experts) and the prevailing situation in the country. However, efforts are being made to get the services of an experienced client.
(c)	In the cash flow statement, the value of laboratory equipment amounting to Rs.225,234.41 which was purchased in the previous years and transferred between the asset accounts in the reviewed year, which was not in accordance with the terms mentioned in the Sri Lanka Public Sector Accounting Standard No. 02, was stated as an expenditure of money in the reviewed year.	This value has been reduced by work in progress shown under investing activities.
(D)	Unrecognized direct bank credits as at 31st December 2021 amounting to Rs.12,897,354 were shown in the financial statements under current liabilities as expenses to be paid without taking steps to identify them in the year under review.	Smart Online Payment Gateway System (WEB PAY, SMART PAY, LANKA QRInternet payment gateway and APP Biller) has been implemented from the end of 2021 to avoid this situation and to identify and account for the relevant direct banking transactions. And the bank has been informed not to allow money to be collected in our account without a proper invoice number. This value of Rs. 12,897,354/- has been reduced to Rs. 5,270,109.39 by May 2022. The rest of the direct banking transactions are being verified.

Report of the Auditor General as per the Section 12 of the National Audit Act No 19 of 2018 on the Financial Statements of Industrial Technology Institute for the year ended on 31st December 2021 and other legal and regulatory requirements.

(e)	As of December 31 of the year under review, the debtor balance is Rs.11,124,306 as per the debtor time analysis, but in the financial statements (accounts) note 18A) the debtor balance is shown as Rs.15,718,055, so the debtor balance in the debtor time analysis the financial statement shows a difference of Rs. 4,593,749/- However, the changes were not checked and reconciled in the financial statements.	The computer software company has been notified to correct this difference. At present, the relevant correction is being made.
(f)	At the time the amounts are deposited by the clients in banks online for the services obtained from the institution and at the time the original receipts are submitted to the institution the same transaction has been entered in the ledger twice and therefore the debtor balance has been set Rs.7.602,974 less and the cash balance has been stated more than the value. Accordingly, bank reconciliation has been prepared by entering such values as uncleared deposits.	This was simply due to the prevailing COVID-19 situation in 2020 and 2021 which resulted in the majority of people depositing money online and the relevant staff working from home and it caused practical difficulties in carrying out the necessary communication activities. This situation has been properly adjusted by now.
Other Audit Observations		
(a)	The amount of Rs. 14,535,683, which is 1 to 7 years old in the receivable balance, was not recovered during the year under review and the amount of Rs. 17,0744,754 due from 21 officials who violated the terms of the foreign scholarship agreements was not recovered as at 31st December 2021.	Out of Rs.17,044,754/-, a total amount of Rs.4,020,392/- is related to 17 officers and measures were taken to recover the relevant money from the officers who violated the agreement, but those procedures failed because those officers have left the island. Many of their guarantors are also out of the island and some are no longer alive. A timeline analysis of the officers who breached the agreements is given below. More than 30 years 04 More than 20 years 08 More than 10 years 06 Necessary arrangements are being made with the Attorney General's Department for the two officials who breached the contracts worth Rs 12,541,165/-. One of these officials has arranged to pay this amount according to the agreement.
(b)	04 bank accounts with the value of Rs.2,448,085 had been maintained as inactive bank accounts for over 06 years, and the money had not been invested.	The account number 000-2876-229 was used for the coir project, which was a coir-related project, while the account number 000-9283-122 and the account 000-8174-439 are the accounts of the

Report of the Auditor General as per the Section 12 of the National Audit Act No 19 of 2018 on the Financial Statements of Industrial Technology Institute for the year ended on 31st December 2021 and other legal and regulatory requirements.

		EEPEX project and this will be used for the GIZ project that will be implemented from the year 2022. Account number 76175979 is the bank account related to the project with GIZ and a new project has been started with GIZ from the year 2022 and this account can be used for that.
(c)	A modern pharmaceutical laboratory accredited including GLP status with facilities at the same level as advanced pharmaceutical laboratories in developed countries has been in operation at the institute since 2019 with an expenditure of Rs. 99,423,972 from the treasury allocations, but The Drug Regulatory Authority including the hospital system had not taken steps to obtain the services of the said laboratory to procure and distribute medicine. Therefore, it was observed that this laboratory is not being used as an independent accredited third party laboratory for the development of the pharmaceutical sector in Sri Lanka, which was the main purpose of establishing the laboratory. Furthermore, its main objectives, which were to become a locally/internationally recognized center of excellence for drug analysis, to solve national problems related to the quality of drugs chemical and physical analysis of all necessary traces of field drugs and to strengthen local regulations and guidelines of drugs, were not fulfilled.	Pharmaceutical Laboratory was established based on government guidance and financial support to streamline the testing of pharmaceutical products imported by domestic manufacturing companies. It was expected that the Ministry of Health would make the necessary policy changes to mandate third-party, independent inspections of the quality of pharmaceutical products by the National Drug Regulatory Authority for initial registration and subsequent annual registration. The National Drug Regulatory Authority of the Ministry of Health is the organization that has regulatory powers regarding drug testing. As third-party testing is not mandated, drug manufacturers and importers do not approach ITI to test their products. Therefore, it is necessary to implement the state third-party independent test, which is a mandatory requirement by the relevant regulatory authority. Until the above changes in the regulatory framework are implemented, the Industrial Technology Institute will receive only a very small portion of the actual testing requirements for both pharmaceutical and lubricant testing.
(D)	The Petroleum and Lubricant laboratory which was established as per the decision of the cabinet of Ministers dated 31st August 2016, spending an amount of Rs. 117.7 million in accordance with the PUCSL to carry out third party checks of petroleum products, it was observed that the basic tasks of establishing the laboratory have not been accomplished because a system for receiving petroleum samples has not been established.	As there is no regulatory authority for our laboratory, all samples are not received by our laboratory. This process is within the basic objective and since it is a national need, actions are being taken to implement it on the commitment of the Ministry of Energy and the Public Utilities Commission of Sri Lanka and the decision of the Cabinet of Ministers.