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அடிப் படைக் கற்கைகளுக்கான தேசிய நிறுவகம்
NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES



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வருடாந்த அறிக்கை
ANNUAL REPORT
2017

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விஞ்ஞான, தொழில் நுட்ப மற்றும் ஆராய்ச்சி அமைச்சு
Ministry of Science , Technology and Research



081 2 232 002



081 2 232 131



info@nifs.ac.lk



www.nifs.ac.lk



Ministry of Science, Technology & Research



National Institute of Fundamental Studies

ANNUAL REPORT

2017

Compiled by: Mr. S.D.P.G.P. Piyathilaka, Communication & Media Officer, NIFS
Cover Design: Mr. Gayan Bandara, Technical Officer, NIFS
Sinhala Translation: Ms. U.K.N.S.V. Widyawardena
Tamil Translation: Ms. Nithiyakala Prabaharan
Proofreading English and Sinhala: Ms. K.I.K. Samarakoon, Stenographer, NIFS

***** Please consider the English Medium document as the Main Report, since the working medium of the Institute is English Language***

CONTENTS

	<i>Page</i>
1. Introduction	04
2. Board of Governors	05
3. Research Council	06
4. Audit & Management Committee	07
5. Organization Structure	09
6. Director's Report	10
6.1 Director's Message	10
6.2 Performance of the Institute	10
6.3 Human Resources	24
6.4. Annual Budget	30
7. Annual Accounts	31
8. Report of the Audit & Management Committee	42
9. Audit General's Report	43
10. Observations of the Members of the Board of Governors	55

1. Introduction

National Institute of Fundamental Studies

The National Institute of Fundamental Studies (NIFS) was established in 1981 by the Parliament Act No 55. NIFS is the only national institute which by its Act, has the main objective as to initiate, promote and engage in advanced research in fundamental studies with an emphasis on basic research for the advancement of scientific knowledge, human resources, and national development.

Vision

“To be a world renowned center of excellence for research in fundamental studies.”

Mission

“Initiate, promote and Engage in advanced research in fundamental studies for the enhancement of scientific knowledge, human resources, and national development”

Objectives

- Initiate, promote and conduct research and original investigations to fundamental studies in general with particular emphasis on mathematics, physical and chemical sciences, life sciences, social sciences and philosophy, taken in the broadest sense to collaborate with public and private institutions as may be necessary to develop applications relevant to the studies conducted.
- Arrange lectures, meetings, seminars, and symposia in pursuance of its research work and for the diffusion of scientific knowledge;
- Invite scientists in Sri Lanka and from abroad, who are actively engaged in creative work to deliver lectures and participate in its research activities;
- Establish and maintain liaison with scientific workers and scientific institutions in other countries and promote international co-operation in matters relating to the aims and objects of the Institute, while taking care to protect and promote the national interest;
- Provide training, guidance, and assistance for research leading to the award of post graduate degrees by institutions recognized by the University Grants Commission established by the University Act, No.16 of 1978.
- Do such other acts and things as may be necessary to promote the aims and objectives of the Institute.

2. Board of Governors

Chairman -Appointed by H.E the President

Prof. Anura Wickramasinghe, Faculty of Science, University of Peradeniya

Members

Ex-Officio members

- The Advisor to the President on Scientific Affairs
- **Prof. Mohan De Silva**, Chairman/ University Grants Commission
- **Prof. S.H.P.P. Karunaratne**, Director/ NIFS

Appointed by H.E the President

- **Prof. M.A.K.L. Dissanayake**, Research Professor/ NIFS
- **Prof. N.G.J. Dias**, Department of Computer Systems Engineering/ University of Kelaniya
- **Dr. W.K.B.N. Prame**, Former Director General/ Geological Survey & Mines Bureau

Appointed by the Minister

- **Prof. C.P. Deepal W. Mathew**, Department of Biochemistry and Molecular Biology/ University of Colombo
- **Prof. M.J.S. Wijeyaratne**, Senior Professor of Zoology & Environmental Management, Univ. of Kelaniya, Chairman/ National Science & Technology Commission

Elected by the Research Council

- **Prof. Namal Priyantha**, Department of Chemistry, University of Peradeniya
- **Prof. U.L.B. Jayasinghe**, Senior Research Professor/ NIFS

Appointed by the Treasury

- **Mr. J.M.U.P. Jayamaha**, Additional Director General/ Dept. of Public Enterprises, Ministry of Finance

Secretary to the Board of Governors/ NIFS

- **Dr. P.S.B. Wanduragala**

3. Research Council

Chairman

- Prof. S.H.P.P. Karunaratne, Director/ NIFS

Members

Appointed by H.E the President

- Prof. D.M.D. Yakandawala, Faculty of Science, University of Peradeniya
- Prof. Ruwan Duminda Jayasinghe, Faculty of Dental Studies, University of Peradeniya

Nominated by the University Grant Commission

- Prof. H.M.D. Namal Priyantha, Professor Chemistry, Dept. of Chemistry, University of Peradeniya
- Prof. R.L. Chandrajith, Department of Geology, University of Peradeniya
- Prof. G.K.R. Senadeera, Department of Physics, The Open University of Sri Lanka
- Prof. D.K. Weerakoon, Department of Zoology, University of Colombo

Ex-Officio:

Senior Research Professors, Research Professors, Associate Research Professors & Senior Research Fellows of National Institute of Fundamental Studies

- Prof. A. Nanayakkara
- Prof. J. Bandara
- Prof. U.L.B. Jayasinghe
- Prof. G. Seneviratne
- Prof. M.A.K.L. Dissanayake
- Prof. D. S. A. Wijesundara
- Prof. S.P. Benjamin
- Prof. M.C.M. Iqbal
- Prof. G.R.A. Kumara
- Prof. N.D. Subasinghe
- Prof. D.N. Magana-Arachchi
- Dr. R.R. Ratnayake
- Dr. M.S. Vithanage

Elected by the Research Fellows of National Institute of Fundamental Studies

- Dr. H.W.M.A.C. Wijayasinghe
- Dr. R. Liyanage

Secretary to the Research Council

- Dr. P.S.B. Wanduragala

4. Audit & Management Committee

Committee Members

1. Mr. J.M.U.P. Jayamaha (Chairman)
(Treasury Representative)
Additional Director General
Department of Public Enterprises
Ministry of Finance
2. Prof. Jayantha Wijeyaratne (Board Member)
Senior Professor (Zoology)
Department of Zoology and Environmental Management
University of Kelaniya
3. Prof. C.P. Deepal W. Mathew (Board Member)
Head of Department
Department of Biochemistry and Molecular Biology
Faculty of Medicine
University of Colombo
4. Prof. N.G.J. Dias (Board Member)
Professor in Computer Sciences
Department of Computer Systems Engineering
University of Kelaniya

Secretary to the Committee (Convener)

5. Dr. P. S. B. Wanduragala (Secretary to the Board)
National Institute of Fundamental Studies
Kandy

Observers

6. Mr. S. W. D. N. Wickramasinghe
Audit Superintendent
Government Audit Division
University of Peradeniya
7. Mr. M. C. Gamage
Chief Internal Auditor
Ministry of Science, Technology and Research

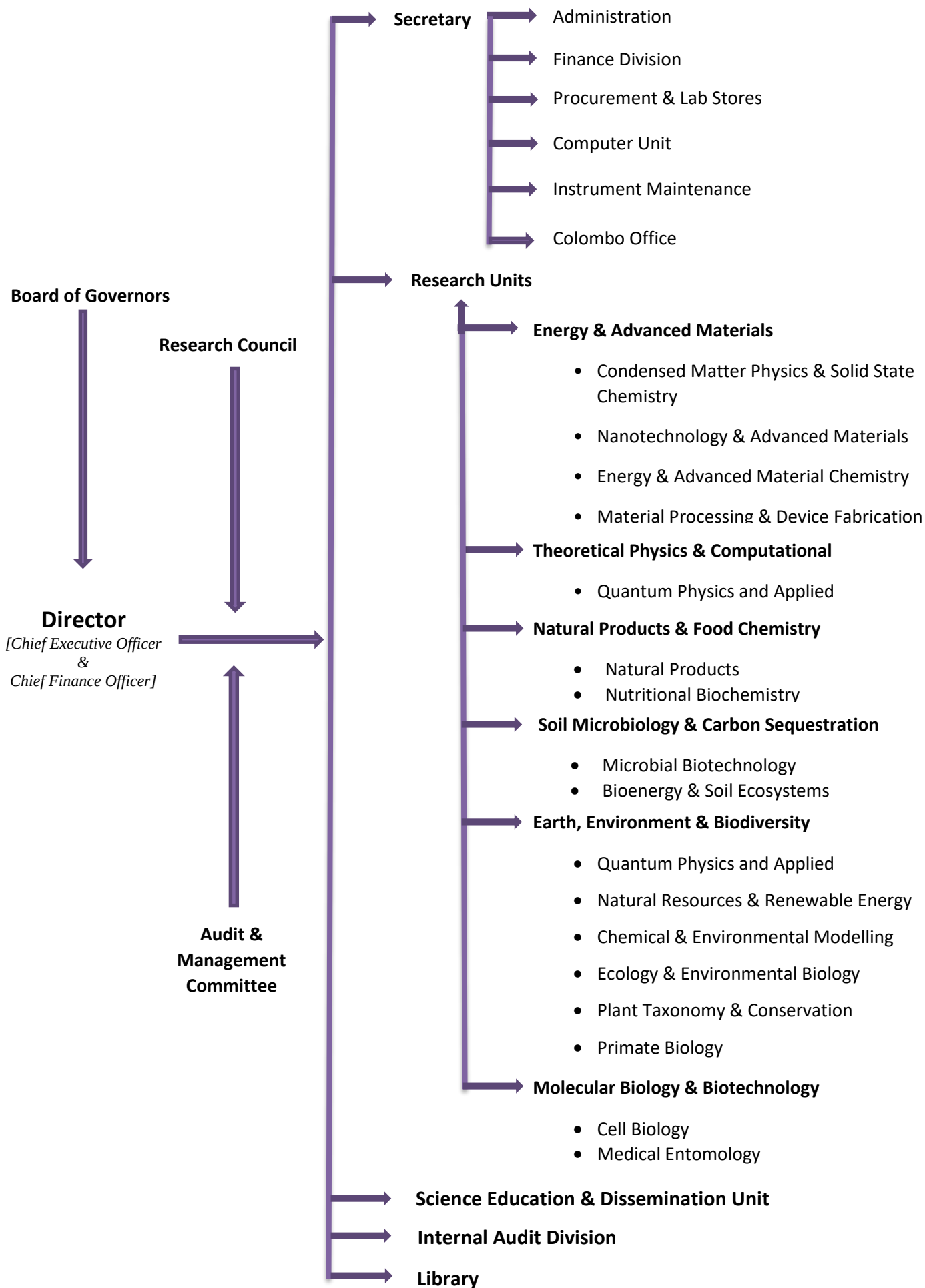
By invitation

8. Prof. S. H. P. P. Karunaratne (Board Member)
Director / CEO / CFO
National Institute of Fundamental Studies
Kandy
9. Mrs. P. S. S. Samarakkody
Accountant
National Institute of Fundamental Studies
Kandy

Assisted by

10. Ms. S. N. Jayasooriya
Mr. Indika Wijesinghe
Internal Audit Officers
National Institute of Fundamental Studies
Kandy

5. ORGANIZATION STRUCTURE



6. Director's Report

6.1 Director's message

The NIFS is a unique organization in Sri Lanka, designed to conduct and disseminate research at the frontiers of basic sciences for National Development. Some of the significant contributions made by NIFS scientists for the advancement of scientific knowledge are showcased on this occasion. Presently we focus on 16 different thematic research areas, under six research units.

There are 16 project leaders and many young scientists engaged in this arduous task. The six research units are - Energy & Advanced Materials, Theoretical Physics & Computational Studies; Natural Product & Food Chemistry; Microbiology & Carbon Sequestration; Earth, Environment & Biodiversity; and Molecular Biology & Biotechnology. These research programs engage in active collaboration with national, regional and international scientific groups. NIFS scientists have been successful in securing competitive research funding from national and international donors, to support their research activities. During 2017, the NIFS was able to appoint five senior scientists to work in the Environmental Science, Food Science & Nutrition and Bioinformatics research projects.

We have also initiated collaborative programs with organizations concerned with national development. The NIFS is now recognized as a major training center for postgraduate research in the country. Currently over 80 postgraduate students are at the NIFS, pursuing their scientific research programs leading to postgraduate degrees. In addition, the NIFS provides a platform to disseminate significant research findings and science education activities through the Science Education and Dissemination Unit of the NIFS.

Prof. Lalith Jayasinghe,
Actg. Director / NIFS

6.2 Performance of the Institute

Over the years, NIFS has achieved several goals with the limited number of resources it had. Progress achieved during the year 2017 had been excellent and the research carried out at NIFS had made a significant contribution towards science, in general, and the development of the country.

6.2.A Summary of the performance in year 2017

6.2A.1 scientific work published:

Scientists at NIFS had published 77 research papers in referred journals including 52 in SCI/SCI expanded journals, and 123 conference papers/ abstracts in the year 2017.

Publications	Number of publications
Scientific work published in SCI Journals	28
Scientific work published in SCI extended journals	24
Scientific work published in Refereed Journals	25
Abstracts of papers presented at conferences/symposia etc.	123
Chapters in Books	10
Others (Bulletins, Newsletters, Magazines, Working papers)	33

6.2A.2 Awards & Recognitions

For the utmost contribution by Scientists of NIFS for the wellbeing of the nation and for the sustainable development of science, our scientists have been awarded and recognized with national & International Awards in 2017.

a) International Awards & Recognitions

- Chairman of the Organizing Committee Solar Asia -2018 International Research Conference (From April 2017).- Prof. M.A.K.L. Dissanayake
- Reviewer for Journal of Power Sources, Elsevier- Prof. M.A.K.L. Dissanayake
- Reviewer for Optik International Journal for Light and Electron Optics
Prof. M.A.K.L. Dissanayake
- Visited China as a member of the Ministerial Delegation to initiate collaborative research on solar cells and facilitate R&D - Prof. M.A.K.L. Dissanayake
- CAS president's international fellowship initiative (pifi) award from Chinese Academy of Science - Prof. J. Bandara
- The associate Editor, Agriculture, Ecosystems & Environment, Elsevier - Prof. G. Seneviratne
- Member of the International Advisory Board of ACS College of Engineering, India
Prof. D. Subasinghe
- The Best Graduate Scientist, from American Geophysical Union, Dr. M. Vithanage
- Supported 5 International documentary films from BBC- Prof. W. Dittus
- Delivered the keynote address on “Historic perspectives and challenges ahead” at University of Sargodha, Panjab, Pakistan - Prof. S.H.P.P. Karunaratne
- Delivered a plenary lecture on “Insecticide Resistance in Insects” at GC University, Lahore, Pakistan - Prof. S.H.P.P. Karunaratne
- Member of the DDT Expert Group, UNEP/ WHO, Geneva, Switzerland
Prof S.H.P.P Karunaratne
- Member of the Editorial Board, International Journal of Entomological Research
Prof S.H.P.P. Karunaratne
- Competitive Erasmus Mundas – Glink Fellowship to undertake collaborative research at the West of Scotland University, UK from European Commission- Mr. M.M. Qader

b) National Awards & Recognitions

- President's Awards for 2015 Scientific Publications presented in year 2017
Prof. M.A.K.L. Dissanayake
Prof. J. M. S. Bandara
Prof. G. R. A. Kumara
Prof. L. Jayasinghe
Prof. N.S. Kumar
Prof. D. Subasinghe
Dr. M. Vithanage
Dr. L.P. Jayarathna
Prof. M.C.M. Iqbal
- Merit Award for Scientific publications in 2014 presented in 2017, National Research council (NRC)
Prof. M.A.K.L. Dissanayake
Prof. G. Seneviratne
Dr. Ruvini Liyanage
Prof. S.P. Benjamin
- SUSRED Awards [NSF Support Scheme for Supervision of Research Degrees] 2016
Prof. G.R.A. Kumara
Dr. L.P. Jayarathna
- Awards for science popularization National Science Foundation and Sri Lanka Association for Advancement of Science - Dr. M. Vithanage
- TWAS-NSF Awardee for Chemical Sciences - Dr. M. Vithanage
- Kandiah Memorial Award for Applied Sciences at the 46th Annual Sessions, Institute of Chemistry Ceylon-Ms. C.L. Kehelpannala
- The Kandiah Memorial Gold Award for Basic Sciences at the 46th Annual Sessions, Institute of Chemistry Ceylon - Mr. M.M. Qader
- The best Oral Presenter in Mineral Science and Technology of the International Research symposium of Uva-Wellassa University, IRSUWU 2017 - Ms. S. Pynthamil
- 3rd Place of the best oral presenter: Research Symposium on Mineral Resources of Sri Lanka - Mr. H. P. T. S. Hewathilake,
- The President-Elect the Geological Society of Sri Lanka. Prof. D. Subasinghe
- Chairperson: Young Scientist Forum, National Science and Technology Commission- Dr. M. Vithanage
- Vice President Section C, SLAAS- Dr. M. Vithanage
- A Co-Chair, National Invasive Species Specialist Group, Ministry of Mahaweli Development and Environment - Prof. D.S.A. Wijesundara
- Member of the National Committee on Biodiversity and Environment, National Science Foundation - Prof. D.S.A. Wijesundara
- Member of the Study Group on Basic Science Research-Policy of NASTEC- Prof. M.A.K.L. Dissanayake, Prof. D.S.A. Wijesundara, Prof. S.H.P.P Karunaratne

- Member of the National Science Foundation Committee on Science and Technology Policy Research - Prof. M.A.K.L. Dissanayake
- Member of the National Committee on Man and Biosphere (MAB), National Science Foundation - Prof. D.S.A. Wijesundara
- Member of the REDD+ Academic and Research Forum, Department of Forest Conservation Prof. D.S.A. Wijesundara
- Member of the Editorial Board of Wildlanka, Sri Lanka Department of Wild Life Conservation - Prof. D.S.A. Wijesundara
- Member of the REDD+ Academic and Research Forum, Department of Forest Conservation Prof. D.S.A. Wijesundara
- Member of the Third National Biodiversity Experts Committee, Ministry of Mahaweli Development and Environment - Prof. D.S.A. Wijesundara
- Member of the National Species Conservation Advisory Group, Ministry of Mahaweli Development and Environment - Prof. D.S.A. Wijesundara
- Member of the National Expert Committee on Climate Change Adaptation, Ministry of Mahaweli Development and Environment - Prof. D.S.A. Wijesundara
- Member of the Working Committee on Basic Sciences, National Science Foundation (NSF), Sri Lanka - Prof. S.H.P.P Karunaratne
- Member of the Working Committee on Science Popularizations, National Science Foundation (NSF), Sri Lanka - Dr. C.T.K. Tilakaratne
- Member of the Integrated Vector Management Technical Committee, Ministry of Health, Sri Lanka - Prof. S.H.P.P Karunaratne
- Member of the Expert Committee, World Bank Funded Ecosystem Conservation and Management Project (ESCAMP) - Prof. D.S.A. Wijesundara
- Member of the Integrated Mosquito Control Programme, Central Environmental Authority, Sri Lanka - Prof. S.H.P.P Karunaratne
- Member of the Advisory Committee & Steering Committee, Sri Lanka Institute of Biotechnology & Biotechnology Innovation Park - Prof. D. N. Magana Arachchi
- Member of the panel for Evaluation of Presentations at Sixth YSF Symposium, National Science and Technology Commission - Prof. D. N. Magana Arachchi
- An observer for Laboratory Accreditation at Industrial Technology Institute (ITI), Sri Lanka Accreditation Board (SLAB) - Prof. D. N. Magana Arachchi
- Reviewer for Basic Science Research Grant Proposals - Prof. M.A.K.L. Dissanayake
- Evaluator for NRC Research Grants 2016-2017- Prof. M.A.K.L. Dissanayake
- Editor-in-chief, Ceylon Journal of Science University of Peradeniya, Peradeniya Prof. M.A.K.L. Dissanayake
- Member of the Editorial Advisory Board Rheedea, Indian Association for Angiosperm Taxonomy - Prof. D.S.A. Wijesundara

- An Associate Editor, Journal of Primatology- Prof. W. Dittus
- "Athi Vishishta Poorna Sewa Prasadini" at the Sewa Prasadini Abhises – 2017 (Service Excellence Awards), Ministry of Wildlife and Sustainable Development - Prof. D.S.A. Wijesundara
- Invited Lecture on 'Plant Migrations' at BMICH, Wildlife and Nature Protection Society (WNPS) of Sri Lanka - Prof. D.S.A. Wijesundara

6.2. B Progress of Research

6.2.B1 Condensed Matter Physics & Solid State Chemistry Research Project Project Leader - Prof. M.A.K.L. Dissanayake

Condensed Matter Physics and Solid State Chemistry project mainly deals with synthesis and characterization of novel polymeric electrolytes for dye sensitized solar cells, rechargeable batteries and electrochromic display devices.

During 2017, the Condensed Matter Physics & Solid State Chemistry projects continued research studies on several scientifically intriguing and technologically important sub-projects. The main focus has been on (a) nitrogen doped TiO₂ based novel multilayer electrode for improved photovoltaic performance in dye sensitized solar cells. (b) PbS:Hg quantum dotsensitized, high efficiency solar cell structures with triple layer TiO₂ photoanode, (c) efficiency enhancement in dye sensitized solar cells using nanostructurally modified tri-layer TiO₂ photoanode, (d) development of (PVdF-HFP) co-polymer nanofibre based gel electrolytes for dye sensitized solar cells, (e) development of Mg⁺⁺ ion conducting polymer electrolytes for rechargeable magnesium batteries and (f) fabrication of low cost, polymer nanofibre based water filter for arsenic removal from drinking water.

6.2.B2 Nanotechnology and Advanced Materials Research Project Project Leader - Dr. A. Wijayasinghe

Nanotechnology and Advanced Materials are two emerging fields that primarily responsible for the recent technological advancements in creating a new sort of highly profitable high-tech industrial applications. These applications are mostly dependent on material resources, specially acquired through upgrading natural minerals. In the light of this, Sri Lanka possess a variety of technologically important minerals, which can play a major role in these high-tech applications. However, upgrading of our minerals suitable for these applications has almost been lacking in the country, due to dearth of advanced scientific research conducting along higher value addition to our mineral resources.

During 2017,

- Development of low-cost and performance enhanced advanced materials for energy conversion using low-cost and nano material synthesis techniques.
 - Investigations on effect of dopants in advanced transition metal oxide semiconductors
 - Further development of Sri Lankan graphite electrodes for rechargeable Li-ion batteries
 - Electrochemical performance investigations on Li-ion rechargeable batteries
- Development of materials for the electrolyte and electrode applications in upcoming Na-ion and Mg-ion batteries.
- Value addition to Sri Lankan minerals and related materials for advanced/high-tech/nano-technological applications.
 - Structural modification and ion intercalation investigations on Sri Lankan vein graphite.
 - Preparation of graphene, carbon nano composites and other possible nano entities from Sri Lankan graphite.

Exploration of potential Sri Lankan minerals for efficient water purification and design of a low-cost efficient column water filter for hardness reduction

- Investigation on property enhancement of natural quartz for advanced material applications

6.2B.3 Energy & Advanced Material Chemistry Research Project

Project Leader - Prof. J. Bandara

The main objective of the project is to carry out research on renewable energy. Research is mainly focused on chemistry and physics of new materials for the conversion of solar energy into chemical and electrical energies

Several research projects such as; Extending and adapting current photovoltaic technology mainly dye-sensitized, Q-dot and polymer solar cells to generate electricity directly from solar radiation; Constructing artificial chemical devices mimicking photosynthesis to collect, direct, and apply solar radiation, for example to split water, convert atmospheric carbon dioxide and thus produce various forms of environmentally clean fuels; Chemical, Electrochemical and Photochemical methods for the purification of air and water are the main research topics of the project. Additionally, the project also involves investigation of low cost water and air purification methods for abatement of industrial pollutants by using sunlight.

6.2B.4 Material Processing and Device Fabrication Research Project

Project Leader - Prof. G. R. A. Kumara

Project involves experimentation and basic studies in Material Processing and Device Fabrication with emphasis on graphite, graphite-based devices, carbon super-capacitors, and investigations related to solar cells and other electronic devices based on new materials primarily generated from local minerals.

The ongoing Research Project involves conversion of raw graphitic minerals into value-added products such as expanded graphite, graphene oxide and graphene for a wide range of applications, notably as counter electrodes in dye-sensitized and perovskites solar cells.

Another related area of the project is to utilize coconut shells to produce highly porous and highly conducting activated charcoal for super capacitors and counter electrodes of solar cells. We have also developed super capacitors based on activated charcoal which we have produced by a novel and low-cost method. The model super capacitors studied when optimized may outperform currently commercially available brands.

Our project on converting local vein graphite to expanded graphite and graphene products has also delivered significant results leading to several inventions during the year 2017. We have developed a novel method to delaminate graphite attached to rocks in mined ore and thereby recover graphite from discarded ore. Graphene being the highest thermal conductor and electrical conductor, its large scale production using this procedure will be very important to add a value to limited graphite resources available in Sri Lanka

6.2B.5 Quantum Physics Research Project

Project Leader - Prof. Asiri Nanayakkara

To gain deep understanding of physical mechanisms which are responsible for quantum non-locality, wave function collapse and the quantum to classical transition.

During 2017 we carried out several investigations with regards to quantum and classical correlations and periodic nature of quantum random walks. In the first study, we investigated how the conditions in classical walks manifest in the corresponding quantum walks as correlations by introducing a class of quantum coins which represent classical conditions. It was found that there is a direct link between conditions in the classical walks and the classical

correlations in the corresponding quantum walks. When the two particle motion in the classical walk is statistically independent, the corresponding quantum walk has no classical correlations asymptotically. Although in some recent publications by others, the mutual information has been used as a measure of classical correlations in quantum walks, this investigation revealed that it is generally invalid.

6.2B.6 Natural Products Research Project

Project Leader - Prof. U.L.B. Jayasinghe

The overall objective of the Natural Products Project of the NIFS is the identification of bioactive extracts and compounds from natural sources, as potential resources for control of human and plant diseases. Research activities have been focused on the chemistry and bioactivity of secondary metabolites from plants, fungi (including endophytic fungi) and edible fruits of Sri Lanka during 2017,

- Exploitation of extracts from plant sources and common Sri Lankan fungal flora for use in agriculture and human health.
- Isolation, identification and separation of pure metabolites from plants and fungi. Characterization and application of these metabolites in agriculture and human health.
- Activity
 - Plant secondary metabolites and LC-MS profiling of bioactive extracts
 - Chemistry and LC-MS analysis of bioactive extracts.
- Study of some postharvest diseases and disorders adversely affecting the export potential of fruits of mango var. TomEJC, and their management.

6.2B.7 Nutritional Biochemistry Research Project

Project Leader - Dr. Ruvini Liyanage

Nutritional Biochemistry project focuses on various aspects of functional and nutritional properties of foods and cover a wide area like functional and nutritional properties of food, food safety, and bioavailability of food to improve health and well-being of people.

- Investigating functional properties of locally available food
- Seaweeds collected from some coastal areas were analyzed for nutritional properties and found out that seaweeds available in Sri Lankan coastal area were heavily contaminated with heavy metals. Thus, the study was not continued as the seaweeds may not be safe for consumption. However, based on the findings manuscript is in preparation for public. Anti-inflammatory activity and ACE inhibitory activity assays couldn't be established due to unavailability of chemicals and other required facilities.
- Studies on Food Safety
- Determining heavy metal level in imported milk powder and locally produced liquid milk-Heavy metal accumulation in milk powder available in the market was done and heavy metal accumulation locally produced liquid milk is yet to be completed.

6.2B.8 Microbial Biotechnology Research Project

Project Leader - Prof. Gamini Seneviratne

The research program focuses on investigations of the role of developed microbial biofilms in agriculture, plantations and the environment. With the invention of development of microbial biofilms

Biofilm-based Bio-fertilizers called Biofilm Bio-fertilizers (BFBFs) were developed for agriculture and plantation crops (especially non-legumes, e.g. tea, rice, vegetables etc.), tested extensively under field conditions, and were commercialized in 2014. So far, BFBFs have been used in over 30,000 acres in the country with a chemical-fertilizers (all NPK) cut down up to 50%, and also in organic agriculture.

6.2B.9 Bioenergy & Soil Ecosystems Research Project

Project Leader - Dr. Renuka Rathnayake

Bioenergy research project aims to explore the microbial flora of Sri Lanka for cellulase production and their applications. Microbial cellulases have shown potential application in a wide range of industries including biofuel production, pulp and paper, textile, laundry, food and feed industry, brewing, agriculture etc. The present project also aims to study possible enhancement of enzyme production by formation of co-cultures or biofilm formation.

The project on soil Ecosystems targets to study soil C sequestration potential, its dynamics and the method of improvement in different major vegetation types of Sri Lanka including natural and plantation forests, agricultural plantations, farm lands, home gardens and small holder cultivations etc

Activities carried out during the year

- Assessment and Mapping of Soil C Stocks in Knuckles Forest Region of Sri Lanka
- Assessment and mapping of soil C stocks in Paddy soils of Sri Lanka
- Abundance of Arbuscular Mycorrhizal fungi and their infection in different rice based cropping systems in the dry zone of Sri Lanka
- The Application in Biofuel production and other value added products and processes
- Value addition to treated cyanobacteria; Morphological, Molecular and Taxonomical Identification of most efficient and abundant cyanobacteria in freshwater bodies of Sri Lanka
- Establishment of a cyanobacterial culture collection
- Isolation of Denitrifying Bacteria and their Potential use in Nitrate Removal of Well water of Jaffna District

6.2B.10 Natural Resources & Renewable Energy Research Project

Project Leader - Prof. N.D. Subasinghe

Finding new energy sources as well as better utilising the existing resources are of utmost importance in the face of escalating energy needs. Several research projects have been designed with the above objective in mind. This concept has not been limited to the energy sources, but also extended to other earth resources including mineral and geothermal resources.

Activities carried out during the year

- Evaluate and to explore natural earth resources such as geothermal resources and mineral deposits in Sri Lanka for the potential of utilizing them for national development

- Producing resource as well as hazard maps with a view to distinguish natural and man-made hazards
- Develop new knowledge and understanding on geological and tectonic settings of Sri Lanka and its rocks
- Finding sustainable and environmental friendly solutions to energy problems
- Developing human resources and improving the fundamental knowledge on related subjects

6.2B.11 Ecology and Evolutionary Biology Research Project

Project Leader - Prof. Suresh P. Benjamin

Studies in my lab are currently on plants and animals in terrestrial and freshwater ecosystems worldwide, with a special focus on the Western Ghats-Sri Lanka biodiversity hotspot. The primary focus however is the largely uncharted fields of invertebrate and small plant biodiversity. The invertebrate fauna of our country remains largely unexplored, with most studies originating during the colonial period.

Activities carried out during the year

- Molecular Phylogeny of Goblin Spiders with a Revision of Selected Genera (Araneae: Oonopidae) of Sri Lanka
- Molecular Phylogeny and Systematics of Jumping spiders (Araneae: Salticidae) from Sri Lanka

6.2B.12 Plant & Environmental Sciences Research Project

Project Leader - Prof. M.C.M. Iqbal

The major areas of focus of our project are Environmental remediation of pollutants using plants and plant biomass, restoration of degraded dry forests, flora growing on serpentine soil, and impact of climate and socio-economic factors on the spread of the dengue virus.

Activities carried out during the year;

- Reusable biosorbents to remove textile dyes from water effluents;
- The development of a reusable biosorbent is a challenging task since the plant materials used in biosorption can easily biodegrade. As an alternative, we have synthesized a composite material incorporating inorganic kaolinite to give structure to the composite material. Composites were developed using alginate (anionic) and chitosan (cationic), extracted from biological sources.
- Remediation of Phosphate and Nitrate
- A model for application was prepared using a composite and the aquatic plant *Salvinia molesta*. The phosphates from a synthetic waste solution was applied to *S. molesta* in a basin followed in tandem by the composite: 86.5% of the phosphates were removed in 50 h.
- Forest degradation and restoration
- Socio –economic survey of communities around Hulu forest reserve, soil seed bank studies and strategies for forest restoration were done.

6.2B.13 Plant Taxonomy and Conservation Research Project

Project Leader – Prof. D.S.A. Wijesundara

This project is involved in a) taxonomic and biogeographical studies of flora of Sri Lanka, b) preparation of the National red list for flora, c) sustainable use of plants, d) factors affecting the conservation of flora of Sri Lanka including Invasive Alien Species, and e) restoration ecology. It goes beyond saying that Sri Lanka's rich biodiversity is facing numerous threats

The government is planning to increase the natural forest cover from the current 29.7% up to 32%. Assisted natural regeneration (ANR) is one of the important methods selected for restoring forest cover in degraded areas. NIFS-Sam Popham Arboretum is considered as the best site in Sri Lanka for ANR. On account of its significance as a bench mark site for Assisted Natural Regeneration, many forest ecologists and botanists use NIFS-SPA as a research site. It is also a popular tourist destination owing to the presence of unique fauna with a rich bird life and some unique animals such as Slender Loris and Pangolin.

A web site based at NIFS on flora of Sri Lanka is under preparation with the assistance provided by Science Education and Dissemination Unit (SEDU). Research activities on natural products from medicinal and invasive plants were carried out in collaboration with Universities of Peradeniya and Jayawardenapura.

6.2B.14 Primate Biology Research Project

Project Leader: Wolfgang Dittus

The research concerns observational studies of monkeys (primates) in their natural forest habitats. Our aims are: (1) to contribute new knowledge to the understanding of the evolution of social behaviour in primates (and by extension in humans); (2) to provide a scientific basis for the effective management and conservation of primates and other organisms; and (3) to disseminate new knowledge through scientific publications as well through professionally produced documentary films with an eye towards - not only educating and entertaining, but also gaining public support for conservation efforts in the local and international communities. Our films contribute positively to the image of Sri Lanka as a tourist destination.

The scientific work has been buttressed by studies in population genetics, paternity exclusion, epidemiology and physiology as they relate to the behaviour, ecology and vital statistics of wild monkeys. In practice, at our study site at Polonnaruwa, we have identified several thousand individual monkeys. For each macaque, we trace its behavioural, genealogical, ecological and demographic history and in this way link variables of behaviour and environment to those of survival. To this end, we require large samples over extended periods of time to assure statistical soundness. Some years ago we have begun similar investigations of the gray and purple-faced langur at our research site at Polonnaruwa. New studies focus on the slender loris as well.

Activities carried out during the year

- Demography and range use of toque macaque *Macaca sinica sinica*. Routine monthly census of 20 groups of toque macaques to monitor rates of birth, death, immigration and emigration. Census of “lost groups” of toque macaques that have left limits the 3 km² designated study area and transferred into surrounding human inhabited areas. Initiate drafting new maps to incorporate expanded areas of occupancy by 34 study groups. Monitor group fission. Researchers: Mr. Sunil Gunathilake and Chameera Pathirathna, professionally certified naturalist staff of the Association for the Conservation of Primate Diversity (ACPD), Polonnaruwa.
- Demography and range use of hanuman langur *Semnopithecus priam thersites*. Routine monthly census of 11 groups hanuman langurs to monitor rates of birth, reproductive seasonality, sex ratios at birth, change in age-sex composition of groups with time, mortality and transfer between social groups. Range use changes according to month and year. Researchers: Mr. Sunil Gunathilake, senior naturalist of the ACPD, Polonnaruwa.
- Demography and range use of purple-faced langur, PFL, *Semnopithecus vetulus philbrickii*. Routine monthly census of 14 groups PFL langurs to monitor rates of birth, reproductive seasonality, sex ratios at birth, change in age-sex composition of groups with time, mortality and transfer between social groups. Range use changes according to month and year. Researcher: Mr. Sunil Rathnayake, naturalist staff of the ACPD, Polonnaruwa.

- Nocturnal observation of slender loris *Loris lydekkerianus nordicus* in and around the field research station (n=12) at Polonnaruwa. Aim to identify social organization, range use, diet and vital statistics such as birth and death. Main Researchers: Chameera Pathirathna and Sunil Rathnayake, naturalist staff of the ACPD.
- The genetics of langur populations; *Semnopithecus vetulus*, *S. priam* and their hybrids in Sri Lanka. This is a newly established collaboration between W Dittus, Suresh Benajamin of the NIFS and Pravenn Karanth of the Indian Institute of Science, Bangalore, India. The aim is to define the genetic differences among these populations as it pertains to the evolution of primate species.
- Primate Pathology. The viral, bacterial and epidemiological caused of recent outbreak of venereal disease among Polonnaruwa toque macaques. Collaboration with Prof. Jayanthe Rajapakse, Dr. Kavindra Wijesundera and Dr. Neil Horadoagoda (National University, Australia) and the Veterinary Faculty, Univ Peradeniya.
- Conservation outreach. Seven educational events were carried out for local and foreign organizations and parties.

6.2A.15 Molecular Microbiology and Human Diseases Research Project

Project Leader - Prof. Dhammika Magana-Arachchi

The goal of the project is to identify the disease causing microorganisms, investigate the mechanisms of disease causation, and to determine the risk factors for particular diseases with the aid of molecular and analytical tools

Activities carried out during the year

- Tuberculosis & other pulmonary diseases: Role of lung microbiome in lung cancer and bronchiectasis patients
- Assessment of airborne microorganisms in outdoor & indoor environments: Isolation and identification of airborne bacterial and fungal community in atmospheric particulate matter in Kandy, Sri Lanka. Airborne microorganisms in indoor environments
- Biomarkers for chronic kidney disease of uncertain aetiology (CKDu)

6.2B.16 Rhizobium Inoculant Research and Production Research Project

Project Leader - Prof. S. A. Kulasooriya

Rhizobium Inoculant Research and Production:

The objectives of the projects are to improve rhizobial inoculants and to extend their application to as many species and areas of legume crop and forage cultivations in Sri Lanka. In 2017, we introduced inoculants to larger extends of vegetable bean and mung bean cultivations. Also Ambewela Farm of the Ambewela Livestock Company (Pvt) Ltd, decided to replace urea additions to application of our inoculants to their clover pasture fields from January 2107.

A significant development is the application of our inoculants by the Department of Agriculture for their island wide soybean extension program during Yala 2017. Profuse nodulation (as much as 100 nodules per plant) had been observed in certain locations of Hasalaka. Co-supervision of the project on using *Azorhizobium caulinodans* (a stem nodulating rhizobium) as a biofertilizer for rice in collaboration with Prof. Shamala Tirimanne, University of Colombo.

Freshwater toxigenic cyanobacteria of Sri Lanka:

Surveying toxigenic cyanobacteria in water bodies of Sri Lanka and assisting the use of algae for biofuel production in collaboration with Dr. Renuka Ratnayake, NIFS. Sixty-two water bodies including hydro-power reservoirs, irrigation reservoirs and smaller irrigation and

recreational tanks distributed in the wet, intermediate and dry zones of Sri Lanka were surveyed taking representative samples during both dry and wet seasons. Among the environmental conditions, while pH showed significant variations in the water bodies of the dry and intermediate zones during the dry and wet seasons, no such variation was observed in those of the wet zone. Most significant Pearson's co-relation (0.96) was seen between pH and dissolved oxygen. The measured environmental variables in reservoirs suggest that many of them are shifting towards eutrophication which also explains the high abundance of cyanobacteria (blue-green algae) in most of the studied reservoirs. Focusing on toxigenic cyanobacteria, the study confirmed that *Cylindrospermopsis raciborskii* was present in > 60% of the sampled reservoirs, demonstrating its high prevalence throughout the country.

List of Developed Solutions to address current issues in the country

- I. Low cost, high efficiency dye sensitized solar cells have been fabricated using novel mixed cation electrolytes and innovative TiO₂ three layer photoanodes. Low cost, polymer nanofibre water filter has been developed for removal of disease causing bacteria from drinking water.
- II. Successfully tested a mica coated stainless steel mesh as a novel underwater superoleophobic membrane for the effective separation of contaminated oil-water mixtures. We have obtained a NSF technological grant (8.5 million Rs) to implement the finding in service stations.
- III. Investigated nutritional properties of seaweeds collected from coastal areas in Sri Lanka and found out that seaweeds found in coastal areas in Sri Lanka are highly contaminated with heavy metals and not safe for direct human consumption study to evaluate the prebiotic activity and fermentation properties of legumes in Sri Lanka and found out that chickpea had the highest prebiotic activity among studied legumes.
- IV. Rice (*Oryza sativa*) is the staple food crop in Sri Lanka. Hence, its yield must be increased annually to meet the growing demand. However, this should be achieved with the minimal use of chemical inputs to minimize environmental pollution. Incorporation of Biofilm Bio-fertilizer (BFBF) is a better strategy to reduce the use of Chemical Fertilizers (CF) and increase productivity of paddy lands. BFBFs influence positively on soil fertility and plant-microbe interactions.
- V. Increased effort towards conservation of natural habitat for the most Critically Endangered (IUCN Red List) endemic wildlife resident in the montane zone and the lowland rainforest, a recommendation from professional biologists for over many decades and that continues to be underestimated by policy makers and their implementing agencies (Dittus, 2017).
- VI. Our current research on chronic kidney disease of uncertain aetiology (CKDu) focuses on identifying the blood transcriptome patterns of CKDu patients in different stages of the disease in comparison to healthy individuals, and also to identify significantly differentially expressed genes (DEGs) in relation to biological processes. We were able to identify a panel of six genes which could predict CKDu and CKD, with 75 to 98% accuracy

6.2C Progress of Collaborative and Consultation Division (CCD)

The Collaborative and Consultation Division (CCD) of the National Institute of Fundamental Studies (NIFS) was established in 2009 following the suggestions of His Excellency the President of Sri Lanka as the Chairman of the Board of the Management. It was established to function as a mechanism for collaborative research with outside organizations and to transfer scientific knowledge and technologies

developed at the NIFS to the society at large scale. The CCD is chaired by the Director of the NIFS and coordinated by Prof. S. A. Kulasooriya (Visiting Research Professor) with Prof. Gamini Seneviratne and Dr. Renuka Ratnayake as co-coordinators.

The objectives of the CCD are: to promote, regularize and monitor collaboration of NIFS projects with outside organizations including the private sector and encourage NIFS scientists to engage in productive consultations. Any interested parties for collaboration and Consultation, such as Universities, research Institutes, NGOs & CBOs registered in Sri Lanka, corporate & private sector organizations, should contact the Director of NIFS for further details.

Two activities initiated by the CCD in 2010 are progressing very well and have become the model projects that have delivered extremely useful products on a large scale to strengthen low cost, environmentally benign, sustainable agriculture in Sri Lanka. These are the biofilm-bio fertilizer project implemented in collaboration with Lanka Bio-fertilizers Limited under Nature's Beauty Creations PLC and the Rhizobium project popularized in collaboration with Plenty Foods (Pvt), Oasis Marketing (Pvt) Limited and the Department of Agriculture. Two other recent projects that are gaining a high reputation is the development of Sri Lankan graphite for re-chargeable batteries by the Nanotechnology and Advanced Materials project headed by Dr. Athula Wijayasinghe. These are conducted in collaboration with the Uwa Wellassa University and the Sri Lanka Institute of Nanotechnology.

6.2D Progress of the Science Education & Dissemination Unit (SEDU)

Objectives

Foster the exchange of technical and scientific information for the scientific community & promote the public understanding of science.

Forums for the scientific community:

- Special lectures: intended to provide a quick forum for the IFS scientists and Research Assistants with the eminent scientists visiting the institute and the country
- Journal club meetings: organized for the IFS Research Assistants, for them to get an opportunity to discuss their research problems with the scientists and their peers
- International/National Workshops, symposia and conference

Promotion of Public Understanding of Science

To build up a science culture & to enhance the science tempo of the school community workshops, science camps and training sessions were conducted. In addition, the SEDU conducts programmes for Popularization of science through electronic media as well as printed media.

SEDU is engaged in popularization of science and disseminating research findings of NIFS in different ways of communication. It holds and daily update social media networks of NIFS and SEDU such as Facebook, Twitter and LinkedIn which easily enable science communication and dialogue and official websites. Moreover, we write news and feature articles to printed and electronic newspapers. In 2016, around 30 newspaper articles were published to disseminate science to general public. Besides that, one TV, two television news and two radio news programs were conducted.

Category	Number	Target Group
Workshops	2	Scientific community
Symposium (ARR)	1	Scientific community
Special Lectures/Discussions	20	Scientific community
Journal Club	11	Scientific community
Participating at Exhibitions (Local)	2	General Public
Radio/TV/other Media Programs	3	General Public
Newspaper Articles	33	General Public
Training Programs	3	School Community

Summary of Progress of the Division, based on the Key Performance Indicators (KPIs)

Programme	Number benefited	
Science Message Service (Through Twitter, Facebook, Blog, Web page)	226,125	
Science YouTube Channel		168,508
NIFS YouTube Channel		11,011
Mobile apps for science students		1,313
Facebook pages (SEDU, NIFS)		112,272
Sinhala Science web -Vidumanpetha		11,141
NIFS web page		89,162
Total benefited from e- programmes		619,532

6.2E Progress of the Library Division

The NIFS library was established in 1985 with a small collection of books and journals donated by Prof. Cyril Ponnampuruma, well-wishers and the Asia Foundation. Since then it now has a modest collection of over 6800 books and about 120 Journal titles covering the life, physical and mathematical sciences as well as the philosophy and history of science the fundamental text books, monographs and edited volumes.

Objectives

- Collecting, compiling, retrieving and disseminating information related to our research for the benefit of NIFS research staff and other interested parties, and also NIFS research publications for the benefit of outsiders.
- Developing a well-balanced and relevant information collection.
- Providing access to information in all formats nationally and internationally.
- Creating new technologies and continuously developing facilities for the advancement of learning and research.
- Developing opportunities for improving library environments and optimizing existing physical facilities for both users and staff.
- Co-operating to promote the aims and objectives of the Institute.

Acquisition of Books, Periodicals and Reports

During the last year 71 new books were added to the collection, consisting of 59 purchased books, and 12 books received on complimentary basis. A large number of periodicals, newsletters, and annual reports from local and foreign institutions were also received on a complimentary or an exchange basis, and the library subscribed to 14 journals related to our research.

The current library services

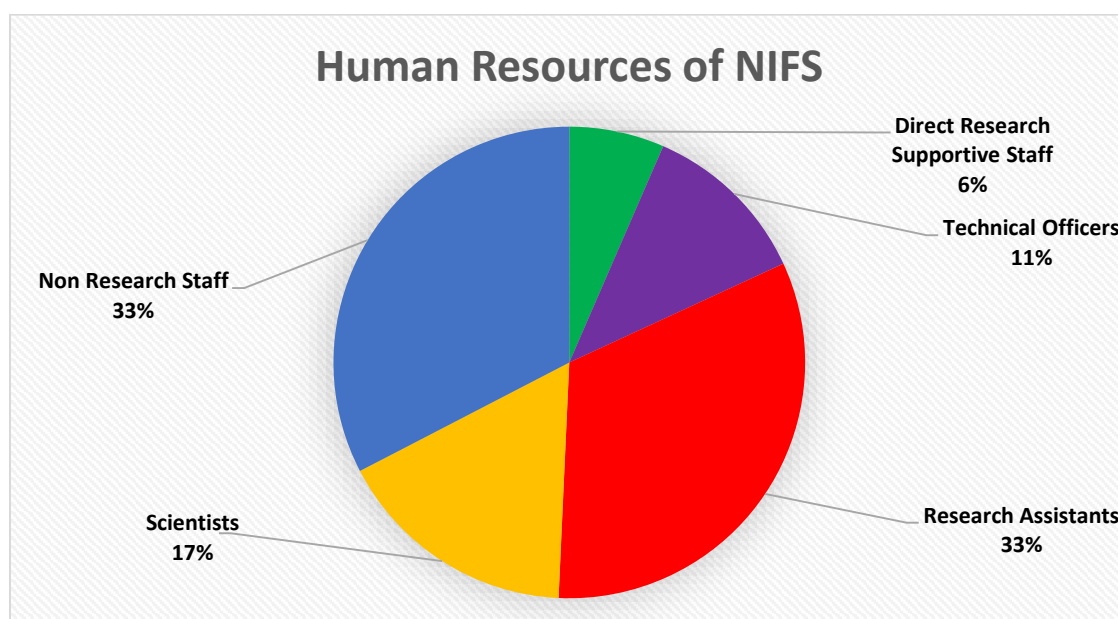
- Reference and lending services,
- Document delivery,
- Resource sharing,
- Inter-library loan facility,
- Information alert services,
- New item arrivals alert service,
- Sourcing web based electronic journals and articles,
- Scientific literature updating service (SLUS).
- In addition, we provides updated, necessary information to NIFS administration works (Circulars, E-code etc.)
- Providing access to the internet using updated computers and facilitating library spaces with photocopying and scanning facilities.

Digitization of Institute Publications

National Science Foundation digitized our Institute's publications. The aim of the project was to establish an institutional e-repository and provide quick enhanced on-line access to Institute publications. Here, 1584 entries were electronically scanned and uploaded to the server

6.3. Human Recourses

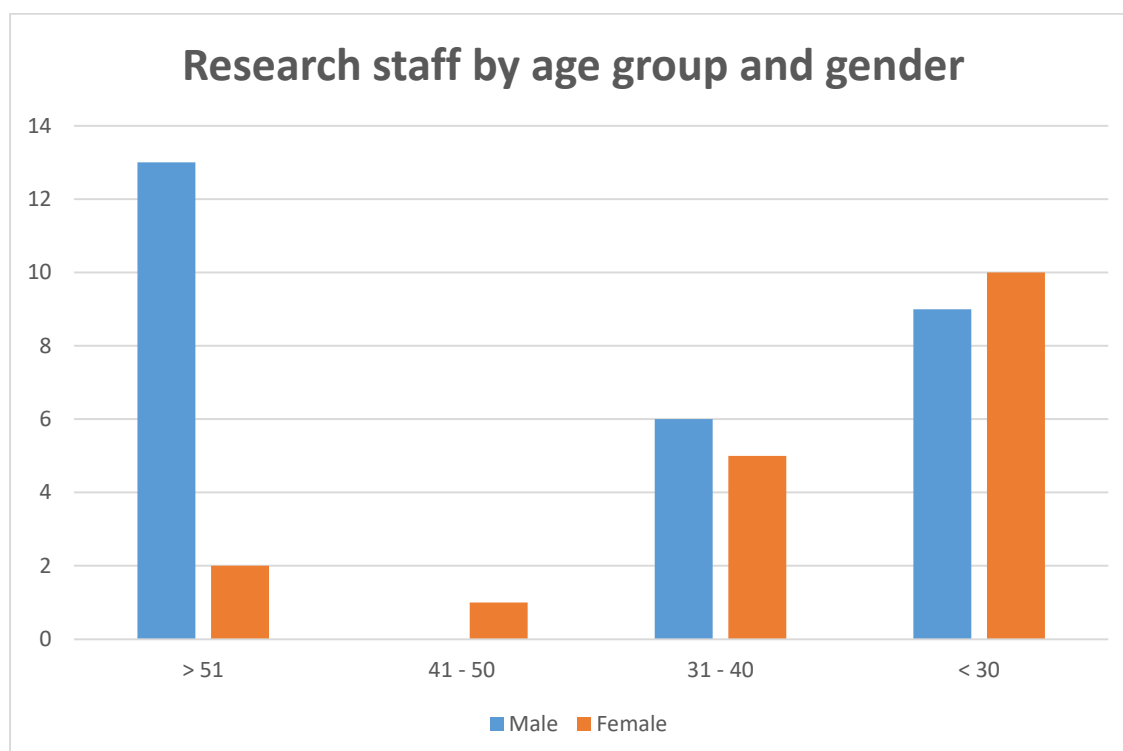
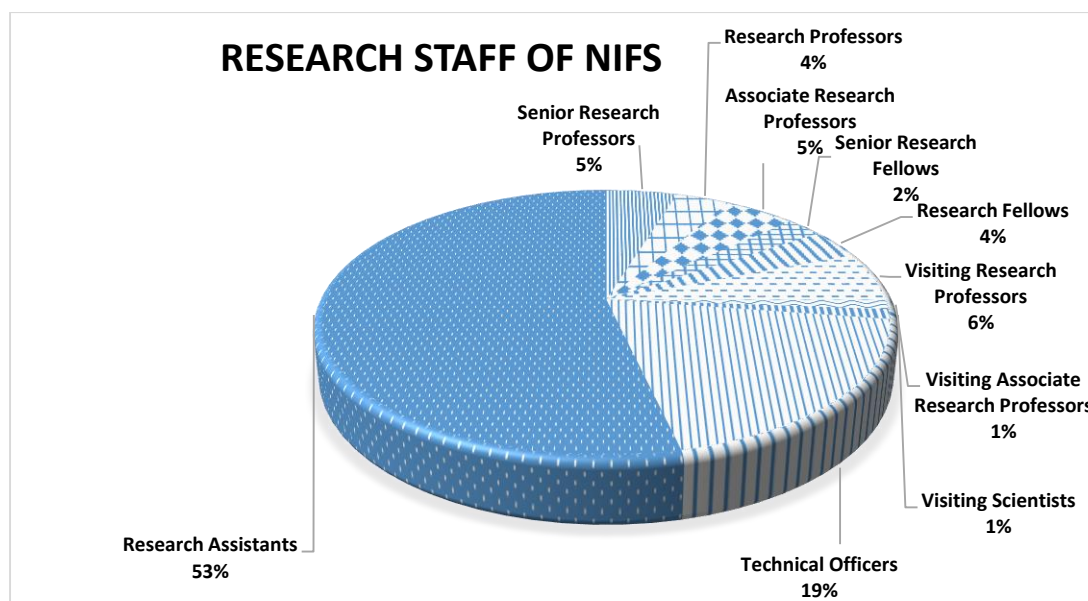
Well qualified human resources are the most valuable assets NIFS has. Administration of NIFS works on providing human resources expertise and services to all staff across the Institute to foster an effective and collaborative work environment that supports Institute's vision and mission.

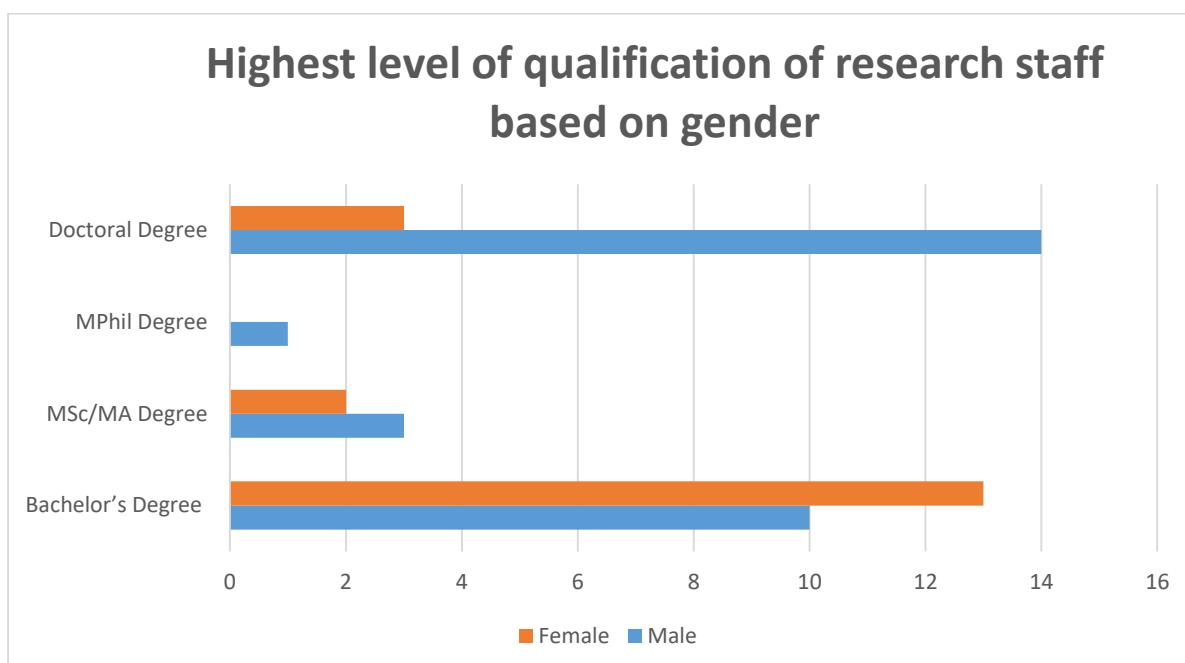


6.3A Summary Information of Staff Strength of NIFS

The HR carder of NIFS constitutes 137 employees and this includes

- 23 Scientists
- 45 Research Assistants
- 16 Technical Officers
- 53 Non Research Staff





Research Staff of NIFS is dignified with two Scientists, awarded with Doctor of Science (D.Sc.)

6.3B New Recruitments and Resigning.

Following New Recruitments had been made at NIFS during the year 2017.

1. Ms. D.M.A.D.E. Liyanage	-	Management Assistant Gr.III
2. Ms. H.M.T.L. Sumanaratne	-	Management Assistant Gr.III
3. Mr. B.A.Y.B. Jayawardena	-	Research Assistant Gr.II
4. Mr. K.A.S.D. Kuruppuarachchi	-	Administrative Officer
5. Mr. P.L.C.U.S.B. Lekamge	-	Research Assistant Gr.II
6. Prof. G.R.A. Kumara	-	Research Professor
7. Ms. G.T.R. Abeynayake	-	Research Assistant Gr.II
8. Mr. D.P.D.M. Senadheera	-	Audio Visual Assistant
9. Mr. H.M.D.A.H. Bandara	-	Research Assistant Gr.II
10. Mr. K.V.G.S. Perera	-	Research Assistant Gr.II
11. Mr. D.M.R.E.A. Dissanayke	-	Research Assistant Gr.II
12. Ms. F.A. Deen	-	Research Assistant Gr.II
13. Ms. D.R.T.L. Harischandra	-	Lapidarist Gr.III
14. Ms. K.D.M.S.P.K. Kumarasinghe	-	Research Assistant Gr.I
15. Mr. P.A.R.P. Kumara	-	Research Assistant Gr.II
16. Ms. R.H.W.M.I.C. Ratnayake	-	Technical Officer Gr.III
17. Ms. S.W. Meepegamage	-	Research Assistant Gr.II
18. Ms. M.A.Y.N. Weerasinghe	-	Research Assistant Gr.II
19. Ms. N. Padmanathan	-	Research Assistant Gr.II
20. Mr. W.M.I.U.B. Wijesinghe	-	Internal Audit Officer
21. Dr. I.P.L. Jayaratne	-	Research Fellow
22. Mr. U.B.R.S. Udapitiya	-	Machinist Gr.III
23. Mr. N.B. Suriyaarachchi	-	Research Assistant Gr.II

Following Staff members had resigned from NIFS in the year 2017.

1.Ms. W.T. Awanthi	-	Research Assistant Gr.II
2.Mr. S.M.P.R. Kumarathilake	-	Research Assistant Gr.II
3.Ms. G.T.R. Abeynayake	-	Research Assistant Gr.II
4.Dr. M. Vithanage	-	Senior Research Fellow
5.Mr. W.P. Jayasekara	-	Machinist-Special Grade
6.Mr. S. Sayanthooran	-	Research Assistant Gr.I
7.Mr. G.D. Dharmasena	-	Electrician
8.Ms. R.W.K. Amarasekara	-	Research Assistant Gr.II
9.Ms. W.S.N.F. Jayasooriya	-	Internal Audit Officer
10.Ms. L.N.M.D.S.K. Nishshanka	-	Accounts Officer
11.Ms. C.O. Gunasena	-	Management Assistant Gr.III
12.Mr. K.N.L. De Silva	-	Research Assistant Gr.II
13.Mr. D.M.V.Y.S. Bandara	-	Research Assistant Gr.II
14.Ms. P.C. Wijepala	-	Research Assistant Gr.II
15.Ms. R.P.S.K. Rajapaksha	-	Research Assistant Gr.II - End of Contract
16.Ms. J.M.K.W. Kumari	-	Research Assistant Gr.II- End of Contract
17.Mr. M.M. Qader	-	Research Assistant Gr.I- End of Contract
18.Mr. G.R.N. Ratnayake	-	Research Assistant Gr.II- End of Contract
19.Ms. D. Thanabalasingham	-	Research Assistant Gr.II- End of Contract
20.Prof. S.H.P.P. Karunaratne	-	Director/NIFS

6.3C Capacity Building /Skill Development/Training

NIFS is serving as a well-equipped training centre for young scientists who study for their post graduate degrees. In 2016, Our scientists have trained 84 students for conducting their postgraduate research. Among them, 11 research assistants obtained their postgraduate degrees in 2016(5 Ph.D.s and 06 MPhil.s). In addition, several M.Sc. students (12) and undergraduates (25) completed their research projects at NIFS in 2017.

Both Research and Non-Research Staff of NIFS have got opportunity to participate for different training/skill development programs which are relevant to their field of work.

Name	Unit	Name of the Training Program	Institute / Training Provider	Funding Agency/ Institute	Time period
Mr. Indika Wijesinghe	Internal Audit Division	Training on maintaining personal files	Prag Service (Pvt) Ltd	NIFS	1 day
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	Red list Assessment of Species Family	Royal Botanical Gardens, Peradeniya.		24th to 28th April 2017

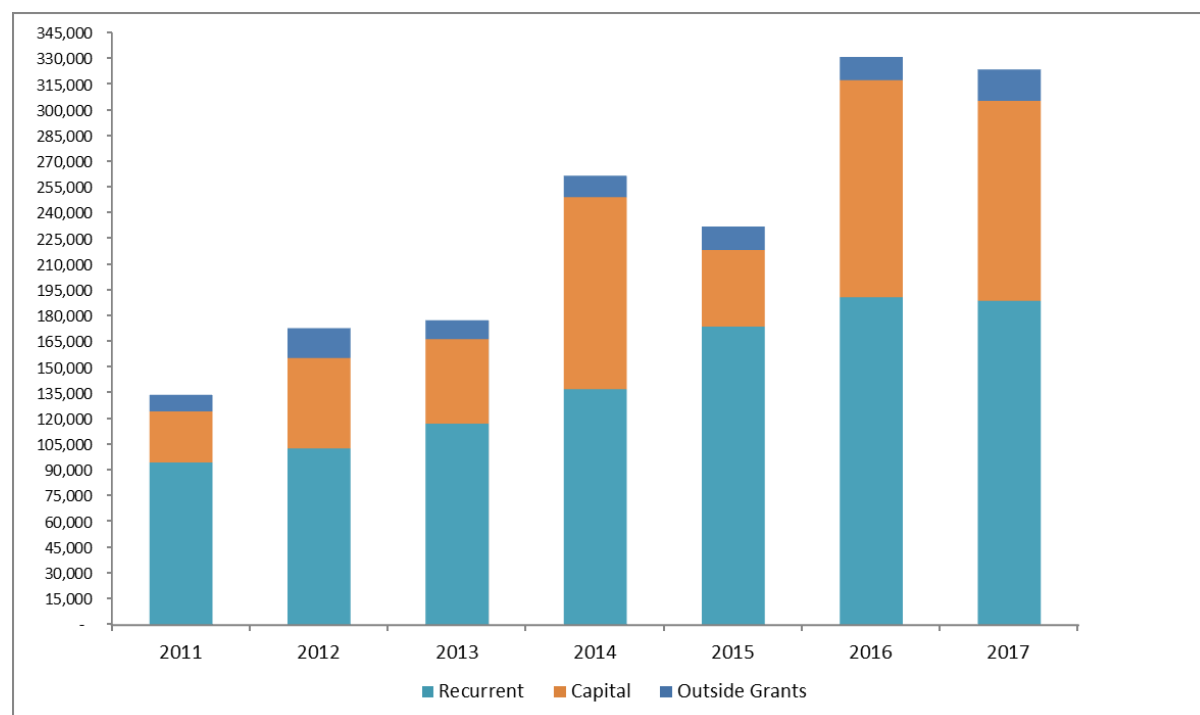
		Ebenacea of Sri Lanka and India			
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	National Lichen Workshop 2017	National Institute of Fundamental Studies (NIFS).		24th to 26th May 2017
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	The Extraordinary World of Bryophytes	The Postgraduate Institute of Science (PGIS), and Department of Botany, University of Peradeniya.		23rd June 2017
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	Historical Biogeography in Phylogenetic context	Royal Botanic Gardens, Peradeniya.		16th August 2017
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	Herbarium Techniques	Royal Botanic Gardens, Peradeniya.		18th August 2017
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	Effect Of Climate Change On Biodiversity	Postgraduate Institute of Science (PGIS), Peradeniya.		27th and 28th October 2017
Mr. P. L. C. U. S. B. Lekamge	Plant Taxonomy and Conservation	National Lichen Workshop 2017	National Institute of Fundamental Studies (NIFS).		24th to 28th April 2017
Prof. G. Seneviratne	Microbial Biotechnology	Keynote speech title: Microbial signaling and sustainability of agroecosystems. International Workshop on Agriculture, Ecosystems and Environment.	State Key Laboratory for Conservation and Utilization of Subtropical Agro-Bioresources, College of Forestry, Guangxi University, Nanning, China.	College of Forestry, Guangxi University, Nanning, China.	1-2 June 2017
Prof. G. Seneviratne	Microbial Biotechnology	Presentation title: Successful commercialization cases of Biofertilizers in Sri Lanka. National Conference on Biofertilizers and Biopesticides.	International Water Management Institute, Battaramulla.	NIFS	29-30 November 2017
Ms. M.D. Jeewa Kasthuri	Director's Office	Workshop on 'Capacity Building'	Professional Development Centre	NIFS	7,8,14,15 December 2017
Mr. N. P. Athukorala	Evolution, Ecology and Biodiversity	Competency Development Program for Technical Officers	University Putra Malaysia, Jalan Upm, 43400 Serdang, Selangor, Malaysia	NIFS	22nd October 2017 to 28th October 2017
Ms. W.D.S.P.Perera	Procurement & Lab Stores	Competency Development	University Putra Malaysia,	NIFS	22nd October 2017 to

		Program for Technical Officers			28th October 2017
Mr. Anura Pathirana	Microbial Biotechnology	Competency Development Program for Technical Officer	University Putra Malaysia,	NIFS	22nd October 2017 to 28th October 2017

6.4. Annual Budget

Funds received for	Source of funding	Amount requested (Rs. Mn)	Amount received (Rs. Mn)	Amount spent (Rs. Mn)
Research projects	Treasury	187,997,000.00	187,697,000.00	187,891,000.00
	NSF	1,931,900.00	1,931,900.00.00	3,240,339.81
	NRC			
	Foreign			
	Other 1. Business Sources 2. Ministry of Mahaweli Development & Environment	2,951,749.52 406,950.00	2,951,749.52 406,950.00	2,634,610.77 264,538.39
Outreach programmes (Science popularization, Workshops, Seminars)	Foreign	1,148,500.00	1,148,500.00	608,289.00
	Other 1. Business Sources 2. Ministry of Science	1,493,622.00 1,900,00.00	1,493,622.00 1,900,00.00	1,193,269.05
Upgrade of the institute	Treasury	98,757,224.00	68,978,379.00	20,472,000.00

Total Annual Expenditure for the past seven years:



7. Annual Accounts

NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES - SRI LANKA

SIGNIFICANT ACCOUNTING POLICIES - YEAR ENDED 31ST DECEMBER 2017

(1) GENERAL ACCOUNTING POLICIES

- 1.1 The financial statements have been prepared on the basis of historical costs in accordance with the Srilanka Public Sector Accounting Standards for the accrual basis accounting and no adjustments have been made for inflatory factors affecting these accounts, instead of Motor Vehicle re-valuation according to the special Re-valuation committee.
- 1.2 Similarly Laboratory Equipment, Machinery Tools & Implements, Refrigerators, Air Conditioners, Communication Equipment, Office & Miscellaneous Equipment, Sports Items are re-valued by the Special Re-valuation Committee and there is no inflator factors affecting to the accounts.
- 1.3 The value of Revaluation of Fixed Asset in 2011 and the value of Motor Vehicle in 2015 have been shown Revaluation Reserve being adjusted by Institute Fund Account. The Revaluation of Motor Vehicles have been done by Examiner of Motor Vehicles of Department of Motor Traffic, Kandy with effective dates of 16.02.2015 and 20.02.2015 at current market value.
- 1.4 Previous year figures and phrases have been re-arranged wherever necessary to conform to the current presentation.
- 1.5 **CONVERSION OF FOREIGN CURRENCIES**
All foreign exchange transactions are converted of the rate of exchange prevailing at the time the transactions were effected. Non-resident foreign currency account balance has been translated at the rate of exchange prevailing at the date of Statement of Financial Position.
- 1.6 **TAXATION**
Under the provision of sections 8(a) (xxxix) and 42 (ff) of the Inland Revenue Act No. 28 of 1979 (as amended) the Institute is exempted from income tax in Sri Lanka.

(2) ASSETS AND BASES OF THEIR VALUATION

2.1 STOCKS:

Stocks have been valued at historical cost basis and all issues are valued at FIFO Basis.

2.2 FIXED ASSETS:

- 2.2.1 The cost of fixed assets is the cost of purchase or construction together with any incidental expenses thereon. The fixed assets are recorded at cost and accumulated depreciation which is provided in the depreciation on the basis specified in 2.2.2
- 2.2.2 The cost of Library Books includes a Heritage Asset (Mapping Report) amounting to Rs. 1,097, 477.65 which is not depreciable.

NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES - SRI LANKA

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2.2.3 DEPRECIATION OF FIXED ASSETS

The provision for depreciation has been calculated on the cost of fixed assets in order to write-off such costs over the estimated useful lives as follows:

Motor vehicles	20%
Library books	33.33%
Building	10%
Lab Equipment	10%
Sports goods	33.33%
Computers	25%
Computer Software	25%
Furniture & fittings	10%
Communication	10%
Air - Conditioners	10%
Refrigerators	10%
Machinery Tools & Implements	10%
Office & Miscellaneous	
Room Linen	33.33%
Crockery Cutlery & Canteen Equipment	33.33%
* Safety Equipment	10%
Office Equipment	20%
Sundry Assets	10%
Expandable Assets	10%

* Safety Equipment - Rate of depreciation had been changed from 33.33% to 10% with effect from 1999.

The depreciation of Fixed Assets are provided from the date of purchased to the date of disposal.

2.2.3 The Accumulated depreciation has been corrected due on 31st December 2017 to meet the Fixed Assets of the Institution by that date.

2.3 INVESTMENT

Employer's and employees' contributions made towards the NIFS provident fund has been invested in fixed deposits at the National Savings Bank.

2.4 Contribution made towards Consumption Loan Fund has been deposited in Savings Account at the National Savings Bank.

(3) LIABILITIES AND PROVISIONS

3.1 All known liabilities and provisions as the date of the Statement of Financial Position have been provided for in the accounts.

3.2 RETIREMENT GRATUITY

Provision is made in these Accounts for retirement gratuity payable under the payment of Gratuity Act No.12 of 1983 in respect of employees with 5 or more years of continued service in the Institute. This item is grouped under deferred liabilities in the Statement of Financial Position.

3.3 N. I. F. S. PROVIDENT FUND

Members' fund as at 31st December 2017 are shown under specified funds in the Statement of Financial Position.

(4) REVENUE RECEIPTS

4.1 GOVERNMENT GRANT

Government grant received during the year under review towards the recurrent expenditure has been charged to the Statement of Financial Performance for the year. Total revenue and capital funds of the Institute accumulated from the previous years have been shown as Institute funds in the Statement of Financial Position.

4.2 FOREIGN AND OTHER GRANTS

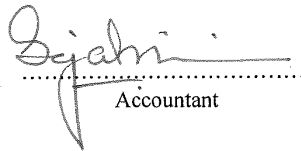
All foreign and other monetary grants received during the year, are dealt with by charging to the Statement of Financial Performance to the extent of such grants recognized in the Financial Statements do match with the associated cost incurred during the year. Unspent grants during the year are shown under specified funds and grants in the Statement of Financial Position.

4.3 RESEARCH GRANT FUND

The un-utilized specified grant balances have been shown as in the Research Grant Fund under specified fund in the Statement of Financial Position.

(5) UTILIZATION OF BUDGET ALLOCATION

The Revised Budget Estimate has been shown in the estimation and the previous year Capital Funds have been utilized in the reporting year.

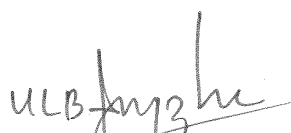

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Accountant

NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES

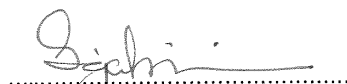
SRI LANKA

STATEMENT OF FINANCIAL POSITION AS AT 31.12.2017

		SLRs 2017	(RESTATED) SLRs 2016
ASSETS	NOTE		
CURRENT ASSETS			
CASH AND BANK BALANCES	1	126,262,803.49	164,994,206
DEPOSITS PREPAYMENTS & ADVANCES	2	21,606,632.11	53,210,960
DISPOSABLE OF FIXED ASSETS		24,915,351.37	24,915,352
FESTIVAL ADVANCE FUND INVESTMENT		300,000.00	300,000
CONSUMPTION LOAN FUND INVESTMENT		268,147.71	381,235
INTEREST RECEIVABLE FOR FIXED DEPOSITS		6,612,943.60	4,521,733
STAFF CONSUMPTION LOAN	3	4,628,889.00	4,317,002
ADVANCE AND OTHER RECEIVABLE	4	147,141.78	764,520
STOCKS	5	2,371,823.92	2,246,152
		187,113,732.98	255,651,160
NON-CURRENT ASSETS			
WORK IN PROGRESS (NEW BUILDING)	6	2,160,000.00	172,171,885
PRELIMINARY EXPENSES FOR CONSTRUCTION		602,687.50	-
PROVIDENT FUND INVESTMENT	7	89,274,351.60	76,925,669
TRAINING CAPACITY		949,197.40	949,197
PROPERTY, PLANT AND EQUIPMENT	8	561,357,327.08	305,033,217
MAPPING REPORT		-	-
MODEL OF LAND			37,500
		654,343,563.58	555,117,468
TOTAL ASSETS		841,457,296.56	810,768,628
LIABILITIES			
CURRENT LIABILITIES			
ACCOUNTS PAYABLE	9	6,306,493.90	1,030,291
ACCRUED EXPENSES	10	2,017,958.12	1,996,126
		8,324,452.02	3,026,417
NON CURRENT LIABILITIES			
SPECIFIED FUNDS & GRANTS	11	117,325,572.97	100,983,184
DIFFERED LIABILITIES	12	28,510,185.50	20,844,045
		145,835,758.47	121,827,229
TOTAL LIABILITIES		154,160,210.49	124,853,646
NET ASSETS		687,297,086.07	685,914,982
NET ASSETS/EQUITY			
CAPITAL FUND - SPENT	13 }	659,406,939.06	542,858,696
- UNSPENT		85,026,600.94	132,596,465
PRESIDENT'S FUND - SPENT		7,078,501.15	7,078,501
ASSET REVALUATION RESERVE		131,630,743.37	131,630,744
INSTITUTE FUND		(195,845,698.45)	(128,249,424)
TOTAL NET ASSETS/EQUITY		687,297,086.07	685,914,982


Acting Director


Secretary


Accountant

NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES

SRI LANKA

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 31.12.2017

		SLRs	(RESTATED) SLRs
	NOTE	2017	2016
OPERATING REVENUE			
RECURRENT GRANT		187,677,000.00	181,000,000
OTHER INCOME	14	12,540,762.78	13,884,468
		200,217,762.78	194,884,468
EXPENDITURE			
PERSONAL EMOLUMENTS	15	122,432,478.30	122,808,073
TRAVELLING	16	1,324,541.22	1,252,975
SUPPLIERS & CONSUMABLE	17	14,011,572.81	15,514,969
MAINTENANCE	18	10,242,573.41	7,454,054
CONTRACTUAL SERVICES	19	22,067,261.30	19,322,160
DEPRECIATION		75,547,835.67	47,630,244
OTHER EXPENSES	20	28,551,782.04	23,748,351
TOTAL OPERATING EXPENSES		274,178,044.75	237,730,826
DEFICIT FROM OPERATING ACTIVITIES		(73,960,281.97)	(42,846,358)
FINANCE COST			
PROFIT/(LOSS) OF TRANSFER OF FIXED ASSETS		-	(928,438.00)
NET DEFICIT FOR THE YEAR		(73,960,281.97)	(43,774,796)

NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES
SRI LANKA

STATEMENT OF CHANGES IN NET ASSETS/EQUITY FOR THE YEAR ENDED 31.12.2017

ATTRIBUTABLE TO OWNERS OF THE CONTROLLING ENTITY					
	CONTRIBUTED CAPITAL	PRESIDENT FUND	REVALUATION SURPLUS	INSTITUTE FUND	TOTAL NET ASSETS/EQUITY
BALANCE AS AT 31 DECEMBER 2016	675,455,161.00	7,078,501.15	131,630,743.37	(129,291,756.08)	684,872,649.44
ADD: FUND ADJUSTMENT IN LAST YEAR				1,042,332.44	1,042,332.44
BALANCE AS AT 31 DECEMBER 2016 (RESTATED)	675,455,161.00	7,078,501.15	131,630,743.37	(128,249,423.64)	685,914,981.88
REVALUATION DEFICIT/SURPLUS	-	-	-	-	-
FIXED ASSET PURCHASE FROM GRANT	-	-	-	740,605.00	740,605.00
ADDITION DURING THE YEAR TO INSTITUTE FUND	-	-	-	5,623,402.16	5,623,402.16
DEFICIT FROM OPERATING ACTIVITIES	-	-	-	(73,960,281.97)	(73,960,281.97)
DESPOSAL OF FIXED ASSETS	-	-	-	-	-
FUND ADJUSTMENTS	-	-	-	-	-
CAPITAL FUNDS RECEIVED FROM GOVERNMENT & OTHER SOURCES	68,978,379.00	-	-	-	68,978,379.00
BALANCE AS AT 31 DECEMBER 2017	744,433,540.00	7,078,501.15	131,630,743.37	(195,845,698.45)	687,297,086.07

NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES
SRI LANKA
STATEMENT OF CASH FLOW FOR THE YEAR ENDED 31.12.2017

	REFERENCE	SLRs. 2017		(RESTATED) SLRs. 2016
Cash-Flow from Operating Activities				
Deficit for ordinary activities	Page 5	(73,960,282)		(43,774,796)
Add/Less : Net adjustment to the fund	Page 6	5,623,402		23,474,091
			(68,336,880)	(20,300,705)
<u>Not involving movement of cash</u>				
Depreciation	Page 19 - Note 8	75,547,836		47,630,244
Provision for Gratuity	Page 28 - Note 20	8,557,091		1,897,958
Profit on Disposal of Capital Assets	Page 25 - Note 14	240,386		928,438
Adjustments to Provision for Depreciation	Page 6	-		1,489,147
(Increase)/Decrease Staff Consumption Loan	Page 4 - Note 3	(311,887)		(39,758)
(Increase)/Decrease Stocks	Page 4 - Note 5	(125,672)		(77,138)
(Increase)/Decrease Advance and other Receivable	Page 4 - Note 4	617,378		(612,610)
(Increase)/Decrease Int.rec.for Fixed Deposits	Page 4	(2,091,211)		(1,326,527)
(Increase)/Decrease Deposits, prepayment and Advances	Page 4 - Note 2	31,604,328		(32,975,008)
(Increase)/Decrease Preliminary Expenses for Construction	Page 4	(602,688)		20,000
Increase/(Decrease) Accounts Payable	Page 4 - Note 9	5,276,203		(3,629,585)
Increase/(Decrease) Accrued Expenses	Page 4 - Note 10	21,832		(166,385)
Gratuity Paid		(644,341)		(964,200)
Adjustment to Accounts Payable		253,610		(127,633)
Adjustment of Fixed Assets		(5,679,175)		(9,941,612)
Increase/(Decrease) Model of Land		37,500		(1,366,835)
			112,701,192	
Net Cash flow from Operating Activities			44,364,312	(19,562,209)
<u>Cash Flow from Investing Activities</u>				
(Increase)/Decrease Working in progress	Page 4 - Note 6	170,011,885		(29,251,885)
Purchase of Fixed Assets		(326,192,771)		(76,636,305)
Training & Capacity	Page 4	-		(67,000)
Adjustments to Fixed Assets		-		-
Investments made- Provident Fund	Page 4 - Note 7	(12,348,683)		(11,582,894)
- Consumption Loan Fund	Page 4	113,087		(155,836)
			(168,416,481)	
<u>Net Cash Flow from Investing Activities</u>			(124,052,170)	(137,256,129)

Cash Flows from Financing Activities				
Government Capital Contribution	Page 6	68,978,379		144,999,579
Specific Funds and Grants	Page 4 - Note 11	16,342,389		12,134,705
			85,320,768	-
Net increase/ (Decrease) in cash and cash equivalent			(38,731,402)	19,878,155
Cash and cash equivalent at beginning of period			164,994,206	145,116,051
Cash and cash equivalent at the end of the period			126,262,804	164,994,206

**NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES
SRI LANKA**

STATEMENT OF COMPARISON OF BUDGET AND ACTUAL EXPENDITURE FOR 2017

EXPENDITURE CATEGORY	BUDGET ESTIMATES	ACTUAL EXPENDITURE
RECURRENT EXPENDITURE	188,100,000.00	191,172,600.74
Personal Emoluments	127,080,000.00	130,989,569.30
Salaries & Wages	103,695,000	100,662,967.82
Overtime & Holiday payments	1,850,000	1,729,883.99
EPF Contribution	14,265,000	13,396,340.52
ETF Contribution	2,685,000	2,679,268.12
Gratuity Payments	645,000	8,557,091.00
Casual Staff Allowances	3,940,000	3,964,017.85
Traveling Expenses	1,320,000	1,324,541.22
Domestic	295,000	300,890.63
Foreign	1,025,000	1,023,650.59
Suppliers	16,545,000	10,416,514.22
Stationery & Office Requisites	495,000	480,991.72
Fuel	2,685,000	2,608,560.54
Chemical, Glassware & Consumable	13,365,000	7,326,961.96
Maintenance Expenditure	10,505,000	10,242,573.41
Vehicle	2,645,000	2,487,138.83
Plant, Machinery & Equipment	5,315,000	5,259,034.36
Buildings & Structures	2,545,000	2,496,400.22
Services	32,650,000	38,199,403
Transport	1,870,000	1,863,988.00
Postal & Communication	1,880,000	1,305,591.13
Electricity & Water	10,240,000	6,878,876.60
Other		
Security	2,555,000	2,617,734.66
Garden Maintenance & Janitorial Services	1,930,000	1,935,930.00
Catering Services	300,000	300,000.00
Internet Services	3,330,000	3,302,591.16
Printing & Advertising	3,210,000	3,211,397.01
Insurance - Building, Vehicle & Staff	1,795,000	1,434,985.02
Welfare	2,415,000	2,287,854.48
Arboretum & Woodland	300,000	300,000.00
Audit Fees	100,000	200,000.00
Legal Fees	55,000	51,500.00
Donation-Publications	-	291.20
Periodical & Journals	95,000	523,689.04
Miscellaneous	1,245,000	1,285,884.45
Annual Review	300,000	299,000.00
Room and Auditorium	25,000	22,918.08
Subscription, Contribution, Membership	885,000	442,665.08
Local Registration fees	120,000	116,672.90

Bank Charges		56,246.00
Grnt Expenses		9,704,707.78
Publication - Donation		
Room Expenditure (On Earnings)		56,880.00
Workshop - Role of Microbial Biofertilizer		-
CAPITAL EXPENDITURE	99,000,000.00	326,952,166.16
Rehabilitation and Improvement of Capital Assets	10,000,000.00	167,808,227.38
Building & Structures	9,500,000.00	166,952,667.38
Vehicles	500,000.00	855,560.00
Acquisition of Capital Asset	89,000,000.00	159,143,938.78
Furniture & Office Equipment		
Fur. Off.- Lab Furnisings (New & Old Building)	3,000,000.00	-
Fur. Off.- Equipment & Others	7,300,000.00	35,678,861.88
Plant, Machinery & Equipment		
(i) Pl. Ma.& Equip.-Lab Equipment	70,000,000.00	113,596,082.75
(ii) Pl.Ma.& Equip.-Library Books	1,500,000.00	775,471.41
(iii) Plat,Machinery & Tools	100,000.00	6,750.00
Lands & Land Improvements	5,000,000.00	9,086,772.74
Software Development ICT	2,000,000.00	-
Training and Capacity	100,000.00	-
TOTAL EXPENDITURE	287,100,000.00	518,124,766.90

8. Report of the Audit and Management Committee

The Audit and Management Committee of the National Institute of Fundamental Studies (NIFS) is appointed by the Board as a subcommittee of the Board of Governors to examine internal controls and financial affairs of the NIFS.

Meetings

During the year ended 31st December 2017, the Audit and Management Committee held 4 meetings. The Chief Operating Officer, who is the Director of the Institution, was invited for all Audit and Management Committee meetings.

Discussions were held with the external auditors regarding the scope and the conduct of the annual audits.

Internal Audit and Risk Management

The Internal Audit Programme was reviewed by the Committee to ensure that it covered the major divisions and activities of the Institution.

The Audit and Management Committee scrutinized and discussed the internal audit reports and audit queries submitted by the Auditor General on internal controls of the Institute ensuring that processes are in place to safeguard the assets of the organization and to ensure that the financial reporting system can be relied upon in the preparation and presentation of financial statements.

The Accountant was invited to be present at all Audit and Management Committee meetings and clarifications were made related to financial operations of the NIFS.

The Internal Audit Officer was invited to be present at all Audit and Management Committee deliberations. He presented a summary of the salient internal audit findings and details of the investigations carried during the period.

The responses of the relevant heads of the divisions to the internal audit findings were reviewed and where necessary corrective actions were recommended.

Internal controls

During its meetings, the Committee reviewed the adequacy and effectiveness of the internal control systems of the Institution giving more attention to the exposure to the financial risks.

Financial statements

The Committee reviewed the Financial Statements of the Institution and the Annual Report for reliability, consistency and compliance with the Sri Lanka Public Sector Accounting Standards and other financial regulations prior to issuance. The Committee also reviewed the adequacy of disclosure in the Financial Statements.

External auditors

The Committee reviewed the Audit Report on annual financial statements issued by the Auditor General's Department, the Management responses thereto and also attended to matters specifically addressed to them. The external auditors kept the Audit and Management Committee informed on an on-going basis of all matters of significance. The Committee met with the Audit Superintendent during meetings and discussed issues arising from the audit and recommended corrective action where necessary.

Conclusion

The Audit and Management Committee is of the view that the control environment prevailing in the Institution provides reasonable assurance regarding the reliability of the financial reporting of National Institute of Fundamental Studies, the assets are safeguarded and that the government rules and regulations have been complied with and also the audited accounts are free from any material misstatements.

9. Auditor General's Report



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මගේ අංකය
எனது இல.
My No.

CLP/KD/J/NIFS/2018/07(i)

ඔබේ අංකය
உமது இல.
Your No.

දිනය
திகதி
Date

31 July 2018

Director,
National Institute of Fundamental Studies

Report of the Auditor General on the Financial Statements of the National Institute of Fundamental Studies for the year ended 31 December 2017 in terms of Section 14 (2)(c) of the Finance Act No.38 of 1971.

The audit of financial statements of the National Institute of Fundamental Studies for the year ended 31 December 2017 comprising the statement of financial position as at 31 December 2017 and the statement of financial performance, statement of changes in equity and cash flow statement 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 Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13(1) of the Finance Act, No.38 of 1971 and Section 36(4) of the National Institute of Fundamental Studies Act, No.55 of 1981. My comments and observations which I consider should be published with the Annual Report of the Institute in terms of Section 14(2)(c) of the Finance Act appear in this report. A detailed report in terms of Section 13(7)(a) of the Finance Act was issued to the Director of the Institute on 01 May 2018.

1.2 Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these Financial Statements in accordance with Sri Lanka Public Sector Accounting Standards and for such internal control as the management determines is necessary to enable the preparation of financial statements that are free from material misstatements whether due to fraud or error.



1.3 Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Sri Lanka Auditing Standards consistent with International Auditing Standards of Supreme Audit Institutions (ISSAI 1000 -1810). Those Standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Institute's, preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Institute's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of financial statements. Sub-sections (3) and (4) of Section 13 of the Finance Act, No. 38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

2. Financial Statements

2.1 Opinion

In my opinion, the financial statements give a true and fair view of the financial position of the National Institute of Fundamental Studies as at 31 December 2017 and its financial performance and cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards.



2.2 Comments on Financial Statements

2.2.1 Sri Lanka Public Sector Accounting Standards

As the useful life of non-current assets had not been reviewed annually in terms of Section 79 of Sri Lanka Public Sector Accounting Standard 07, the non-current assets costing Rs.75,914,655 has been further utilized though, they were fully depreciated. Accordingly, action had not been taken to revise the above estimated error in terms of Public Sector Accounting Standard 03.

2.2.2 Accounting Deficiencies

Even though, the depreciation relating to the year for a laboratory equipment purchased for a sum of Rs.623,358 on 02 May 2017 had been Rs.41,500, it was brought to account as Rs.456,503 and as such the depreciation had been overstated by Rs.415,003.

2.2.3 Lack of Evidence for Audit

Confirmations of balances in respect of the payable balances for supplies and services valued at Rs.6,306,493 and the written evidence to confirm the physical existence of laboratory equipment, tools and furniture shown under current assets valued at Rs.24,915,351 as at the end of the year under review were not made available for audit.

2.3 Receivable and Payable Accounts

Even though, over 05 years had elapsed after paying an advance of Rs.55,863 for a private institution to import laboratory materials on 18 March 2013, action had not been taken to obtain the respective goods.

2.4 Non-compliance with Laws, Rules, Regulations and Management Decisions

The following non-compliances were observed.

Reference to Laws, Rules and Regulations, etc.	Non-compliance
(a) Section II of the Finance Act No 38 of 1971 and Section 8.2.2 of the Public Enterprises Circular No.1111/12 dated 02 June 2003.	Even though the all excess money should invest in fixed deposits, Treasury Bills, short term deposits or any other effective investment with the prior approval of the Minister of Finance, the approval of the Board of Management only had been obtained for an investment of Rs.6,000,000 made by the Institution in the year under review.
(b) Financial Regulations of the Democratic Socialist Republic of Sri Lanka	
Financial Regulation 101	Action in terms of Financial Regulation had not been taken in respect of 7 office and laboratory equipment valued at Rs.1,212,717, identified as misplaced.
(c) Public Finance Circular No.438 of 13 November 2009.	Action in terms of the Circular had not been taken on 324 goods valued at Rs.4,869,102 removed from use in the year 2015.
(d) Treasury Circular No.842 dated 19 December 1978.	A Register of Fixed Assets in respect of fixed assets amounting to Rs.857,381,928 shown in the financial statements had not been maintained.



3. Financial Review

3.1 Financial Results

According to the financial statements presented, the financial results for the year ended 31 December 2017 had been a deficit of Rs.73,960,282 as compared with the deficit of Rs.43,774,796 for the preceding year. Thus, a deterioration of Rs.30,185,486 was indicated in the financial results in the year under review as compared with the preceding year. Increase of expenditure for maintenance and contractual services by Rs.5,533,621 and increase of depreciation by Rs.27,917,592 as compared with the preceding year had mainly attributed for the above deterioration.

In analyzing the financial results for the year under review and 4 preceding years, the deficits were indicated from the year 2013 even up to 2017. However, in re-adjustment of employees remuneration and depreciation of non-current assets to the financial results, the contribution of Rs. 83,417,267 of the Institute in the year 2013 had turned to Rs 124,020,032 in the year 2017.

4. Operating Review

4.1 Performance

4.1.1 Planning

The following observations are made.

- (a) In terms of paragraph 5.1.3 of the Public Enterprises Circular No. PED/12 dated 02 June 2003, a Corporate Plan should be prepared for a period not less than 03 years and updated that plan annually and should be forwarded to the Auditor General, General Treasury, Line Ministry and the Department of Public Enterprises at least 15 days before the commencement of each financial year with the approval of the Board of Management. Nevertheless, the Institute had not prepared and presented the Corporate Plan accordingly.



- (b) In terms of Public Finance Circular No 01/2014 of Secretary to the Treasury dated 17 February 2014, the annual Action Plan should be prepared to execute the entire objectives of the Institution. Nevertheless, the Action Plan prepared for the year under review had included only the procurement activities of the Institution.

4.1.2 Operating and Review

The following observations are made.

- (a) Even though, it was targeted to obtain 4 patent rights for the new innovations through scientific researches in the year under review, only one patent right had been applied.
- (b) Even though, material and equipment amounting to Rs.14,578,967 had been provided during the year for 06 scientists out 19 scientists of the staff who engaged in research activities in the year under review, no progress had been reported in any research activity.
- (c) According to 10 reports of the research review committee meetings in the year under review presented to audit, the review on research progress of scientists had not been carried out.
- (d) Even though, over 30 years had elapsed from the commencement of the Institute, generally accepted methodologies to evaluate research projects had not been introduced. Even though, the decisions had been taken to create annual evaluation processes of research projects through research council of the Institute held on 28 June 2017, such methodologies had not been introduced even by 16 January 2018, the date of audit. Similarly, the related research activities had been commonly given to the members of the research staff while action had not been taken either to include those into the action plan or to obtain approval of the governing council.



4.2. Management Activities

The following observations are made.

- (a) Two cab vehicles revalued at Rs.2,000,000 on 16 February 2015 had removed from use for over a period of one year. Action had not been taken either to repair and utilize or to dispose that vehicles.
- (b) Action had been taken in the year under review to write off the advances totalling Rs.57,918 from the books which granted in 04 instances before the year 1998 for purchase library books, Laboratory material and other equipment with the approval of the governing council without being taken action to recover.

4.3 Operating Activities

Even though, it was mentioned that an insurance cover of Rs.100,000 should be given by the respective contractor for the equipment belonging to the Institution as per the Section 17 of the agreement entered into by the Institution with the contractor who provided the service of maintenance of the restaurant of the Institution on 08 February 2017, the contractor had not given the insurance cover.

4.4 Transactions of Contentious Nature

The activities of management and maintenance of the "Ruk Uyana" situated in Dambulla with a land in extent of 34.5 acres belonging to the Institution had been entrusted in the year 2005 to a private institution for a period of 20 years. Even though, it was revealed in internal audit on 25 May 2017, that the above organization had violated the conditions relating to the agreement, a sum of Rs.300,000 had been paid to the respective organization during the year 2017 without being taking proper action thereon even by 26 January 2018, the date of audit.



4.5 Under-utilisation of Provisions

The following observations are made.

- (a) Out of the amount of Rs.68,978,379 received by the Institution as Government Capital Grants during the year under review, a sum of Rs.48,507,290 or 70 per cent of the provisions had not been utilized and 26 per cent of the provisions relating to the preceding year as well had not been utilized.
- (b) Even though, a cash balance ranging from Rs.88 million to Rs.154 million as at the end of each month, had been maintained in the Institution, action had not been taken either to utilize that money to achieve the objectives of the Institution or to utilize in an effective investment.

4.6 Identified Losses

The following observations are made.

- (a) Three equipment valued totalling Rs.14,053,353 imported in the years 2015 and 2016 had been rejected due to non-complying with the specifications and as such a sum of Rs.1,628,987 paid as custom duty and clearance charges had been deprived by the Institution.
- (b) In terms of Employees Provident Fund Act No.15 of 1958 and the letter of the Labour Commissioner No. 2/අපරාම/11 dated 24 August 2001, the academic allowance had not been defined as cost of living allowance and as such, above allowance should not be considered for the contributions of the Employees Provident Fund and for the Employees Trust Fund. Nevertheless, a sum of Rs.2,752,659 had been overpaid as the contributions of the Institution to the above funds on behalf of the academic staff based on the academic allowance paid as per the instructions of the Circular of the University Grants Commission No.1000 dated 08 January 2013 contrary to the above provisions. Even though, it was pointed out in the preceding years, the remittances had been paid to the fund continuously without being taken action to rectify that,

4.7 Staff Administration

The following observations are made.

- (a) Twenty eight vacancies had existed in 04 posts of the cadre of the Institution as at 15 January 2018, the date of audit. It was observed that nearly 50 per cent of officers had remained vacant within the approved cadre of the research staff of this Institution which was established for the research activities and also it was observed in audit, that had been a serious hindrance to achieve the preliminary objective of the Institution.
- (b) Even though, the approval had been given by the Letter No.DMS/1608 of the Director General of Management Services dated 29 May 2014 to recruit the officers for 03 years contract period for the post of Deputy Director (Research) action had not been taken to prepare recruitment procedures and to fill vacancies with the approval of the Department of Management Services in terms of the paragraph 03 of above letter.

4.8 Uneconomic Transactions

A condition, was included in the agreement entered in to for supply restaurant service for the year under review to supply a person relating to the water lines fixing of the Institution and a sum of Rs.25,000 will be paid monthly thereon. Accordingly, a sum of Rs.300,000 had been paid during year under review without a plan to obtain a suitable service supplier at a least cost based on the requirement.

5. Sustainable Development

5.1 Reaching Sustainable Development Goals

Even though, every Government institution should be carried out activities in terms of the Circular No.NP/SP/SDG/17 issued by the Secretary of the Ministry of National Policy and Economic Affairs and Year 2030 Agenda of United Nations on Sustainable Development. Nevertheless, the National Institute of Fundamental Studies had not taken action to identify/ establish the Sustainable Development objectives and targets relating to the year under review.



6. Accountability and Good Governance

6.1 Procurement and Contract Procedure

6.1.1 Procurements

The following observations are made.

- (a) In terms of Section 4.2 of the Government Procurement Guidelines, a Master Procurement Plan had not been prepared by the Institution. According to the format introduced by the Section 4.2.1 of the Procurement Manual, the Time Schedule relating to the procurements had not been included in the Procurement Plan prepared for the year under review.
- (b) Procurement activities for 05 contractual services amounting to Rs.25,870,610 and 05 construction projects amounting to Rs.20,308,138 in the year under review had not been included in the Procurement Plan.
- (c) An agreement had been entered into for a sum of Rs.2,200,000 with a private institution for Development of a Computer System for the Institution on 28 March 2016. The following matters were observed in this connection.
 - (i) The specialized bidding documents obtained from Department of Public Finance had not been used in procuring information technology systems in terms of Section 9.7 of the Procurement Guidelines.
 - (ii) Even though, a sum of Rs.660,000 had been paid on 28 March 2016 as Mobilization Advances, an acceptable advance payment guarantee had not been obtained in terms of Guideline 5.4.4 of the Government Procurement Guidelines.
 - (iii) Even though, the respective work should be completed by 27 December 2016 as per the agreement, the activity had not been completed even by February 2018. Action had not been taken as well to recover a sum of Rs.220,000 recoverable as delayed charges in terms of paragraph 25 of the agreement.

- (d) As the opportunity had not been given to submit bids through mail under registered post in procuring for contractual services in terms of Guideline 6.3.1 (a) of the Procurement Guidelines, the action had been taken by deviating the objective of to provide reasonable, equal and maximum opportunity for the suitable stake holders for the participation of Procurements.
- (e) As non-implementation of proposed projects as planned by Procurement Plan in the year under review, 03 projects had been commenced the work with delays of a period ranging from 06 months to 11 months. Accordingly, it was observed that the Procurement Plan prepared was not realistic and had not been utilized as an effective instrument of control.

6.1.2 Deficiencies in Contract Administration

Even though, the prices approved by the Department of Buildings or the prices approved by the Central Provincial Council with complying to that should be based in preparation of construction estimates, the construction estimates amounting to Rs.18,306,400 had not been prepared by the Institution with complying of those prices. However, a sum of Rs.619,799 had been paid to the Engineer based on the estimates in the year under review.

6.2 Budgetary Control

Variances ranging from 49 per cent to 12,541 per cent were observed between the budgeted income and expenditure and the actual income and expenditure of 06 items in the year under review, thus indicating that the budget had not been made use of as an effective instrument of management control.

7. Systems and Controls

Weaknesses in systems and controls observed during the course of audit were brought to the notice of the Director of the Institute from time to time. Special attention is needed in respect of the following areas of controls.



Area of Systems and Control

Observations

- | | | |
|-----|---------------|---|
| (a) | Accounting | Non-compliance with certain Sri Lanka Public Sector Accounting Standards. |
| (b) | Planning | Not planned and implemented research activities so as to execute the objectives of the Institute. |
| (c) | Stock Control | Action not taken in terms of Financial Regulations in respect of slow moving and idle stocks. |

W.P.C. Wickramaratne
Acting Auditor General

10. Observations made and approved by the Board of Governors on 01st December 2018 with regard to the Report of the Auditor General issued on 31st July 2018 on the Financial Statements of the National Institute of Fundamental Studies for the year ended 31st December 2017 in terms of Section 14 (2) (C) of the Finance Act, No. 38 of 1971. (Ref. CLP/KD/J/NIFS2018/07, section 11

2.2 Comments on Financial Statements

2.2.1 Sri Lanka Public Sector Accounting Standards

Action has been taken to revalue all the assets and to prepare a detailed fixed asset register.

2.2.2 Accounting Deficiencies

This has been rectified through Journal Voucher 63 in 2018 books.

2.2.3 Lack of Evidence for Audit

Confirmation has been called for Supplies and Services balances amounting to Rs.6,306,493. Balances are being confirmed.

Committee has been appointed to verify the physical existence of assets amounting to Rs.24,915,351. Action will be taken to dispose of these assets based on the Committee Report.

2.3 Accounts Receivable and Payable

Two items of this order were not released from the Customs as clearance was required from National Dangerous Drugs Control Board. Even though we received clearance from Central Environmental Authority, further clarifications were required by the National Dangerous Drugs Control Board. On account of the delay in releasing the goods, demurrage had to be paid but finally, the items were not to be found.

2.4 Non-compliance with Laws, Rules, Regulations and Management Decisions

- (a) Noted to take action according to the relevant circulars.
- (b) Necessary action is being taken related to the respective items.
- (c) Unserviceable items were auctioned on 4th May 2018.
- (d) Action will be taken to compile the Fixed asset register with reference to the Treasury Circulars and the Government General Form for Fixed asset register.

4 Operating Review

4.1 Performance

4.1.1 Planning

- (a) Work is underway to prepare a 5 year Corporate Plan in accordance with the respective Public Enterprise Circular. Assistance from the Ministry of Science, Technology and Research is expected to achieve this task. It is

intended to update the Corporate Plan prior to the commencement of each year and then to obtain approval from the relevant authorities.

- (b) It is arranged to prepare an Action Plan from year 2018 onwards after including the key performance indicators.

4.1.2

Operations and Review

- (a) Need to wait till the patent is issued by the National Intellectual Property Office of Sri Lanka, which is beyond the control of NIFS.
- (b) Since our work is focused towards fundamental research, it is sometimes difficult to directly relate our achievements to the objectives and targets.
- (c) All the matters relevant to research work are discussed during the Research Council Meetings, such as facilitating research work, procuring new equipment, monitoring research progress etc.
- (d) Annual Research Review is conducted with the approval of the Board of Governors and the Research Council in order to evaluate the progress of the projects with related to the objectives of the Institution. During this review, Scientists and the Projects are evaluated individually.

4.2

Management Activities

- (a) Action has been taken to cancel the registration of the vehicle No. 54-1066, which was revalued at Rs.1,200,000. Once the registration is cancelled, necessary action will be taken to handover the vehicle to the school appointed by the Ministry of Education.
Vehicle No. 53-9099 which was revalued at Rs.800,000 has not been removed from running. Since most of the vehicles at NIFS are of old condition, vehicle No. 53-9099 is used when the other vehicles are under repair.
- (b) Since adequate information was not available with the Institution with related to the purchases made from foreign suppliers, the Board of Governors approved to write off the following advances on 05.02.2017.

Description	Year	Rs.
Amersham life Science Ltd	1997	1,546
Bacheman California	1995	11,874
Fluka Chemical	1998	34,771
Wageningen Agriculture University of Netherlands	1998	9,727
		57,918

4.3

Operating Activities

Noted. Necessary action shall be taken at the earliest.

4.4

Transactions of Contentious Nature

As per clause 10.1 of the agreement which was entered into between Ruk Rakaganno and the National Institute of Fundamental Studies, it was agreed to pay Rs.15,000 per month. Provision has been made in clause 10.3 to increase this payment annually after considering the contribution made.

National Institute of Fundamental Studies had not increased this payment before. After giving due consideration to the request made by Ruk Rakaganno, and the recommendation made by the Management Committee, the Board of Governors decided to increase the payment to Rs.25,000.

4.5 Underutilization of Funds

- (a)** Noted to utilize the funds to obtain the maximum benefit.
- (b)** Noted to adhere to the relevant circulars.

4.6 Identified Losses

- (a)** This amount has been paid to release goods from Sri Lanka Customs. The foreign company only pays the amount that they received and they are not liable to pay the amount charged by the Customs.
- (b)** The education allowance has been paid to the research staff based on the Circular 1000 on 08.01.2013 of the Commission and according to the instructions given by the Management Services Department of the Ministry of Finance and Planning to the Ministry of Science, Technology and Research through letter No. DMS/B1/62/03/VOII dated 27.03.2017.

4.7 Personnel Administration

- (a)** Research Assistants are recruited on contract basis. Once their tenure is over they leave the Institution and replacements are done only afterwards. As a result, there is a shortage of few Research Assistants. Work is underway to fill the vacancies as per the government regulations.
- (b)** The said Deputy Director (Research) position is expected to make a significant contribution to the research work done at the Institution and should also attract foreign grant. Therefore, this position should be filled by a senior research scientist and he/she should be compensated with a salary equivalent to a University Professor.
Therefore, request has been made to change the Salary Scale for the post of Deputy Director (Research) from UAC4 (2006) to UAC5 (2006) from the Department of Management Services. In the reply dated 27.03.2017 it was informed that the application of UAC5 was not possible for this position. Further, on the letter DMS/E2/62/7/277 dated 11.04.2011 it has been instructed to use UAC4 salary scale.
On account of the disagreement occurred in the approved salary scale, action will be taken to discuss this matter with the Management Services Department.

4.8 Uneconomical Transactions

The work is currently being performed by the Contractor and the approval has been obtained from the Board of Governors.

5 Sustainable Development

5.1 Achieving Sustainable Development Goals

Sustainable Development Goals of the National Institute of Fundamental Studies have been identified in the year 2018 according to the respective circular and the agenda.

6 Accountability and Good Governance

6.1 Procurement and Contract Process

6.1.1 Procurement

- (a)** Noted. Corrective action will be taken.
- (b)** Noted. Corrective action will be taken.
- (c) (i)** For the installation of the integrated software at the National Institute of Fundamental Studies, an invitation for bids was published on the Daily News paper dated 15th October 2015. As per the Terms of Reference (TOR), service provider was chosen after the evaluation of a Technical Committee.
- (ii)** Even though a performance bond was not obtained from Sarasa Solutions (Pvt) Ltd, the progress thus far is at satisfactory stage as they have agreed to install the integrated software and work has been performed according to the time table (Currently implementation period). Progress as at 01.05.2018 has been identified.
- (iii)** It was not possible to acquire the computer equipment required for the installation of the software system prior to 27th December 2016. Further, Sarasa Solutions (Pvt) Ltd. identified that the actual scope of the project compared to the areas identified during the initial estimation and the time allocation during the tendering process was different.
Sarasa Solutions (Pvt) Ltd. has informed that the development period of the integrated software was extended due to the delays occurred in documenting the full scope of the project, software development, preparation of project reports and documenting the process.
Due to the lapses caused by both the parties, it was not possible to impose delay charges as per the clause 25 of the agreement. Having agreed to rectify all the shortcomings, both the parties entered into a revised agreement on the 11th April 2018.
- (d)** Bids were not called by registered post. Noted and will be corrected hereafter.
- (e)** It is noted to include the proposed projects in the Procurement Plan and to use it as an effective control mechanism.

6.1.2 Weaknesses in Contract Administration

As per the Guidelines Structure for Engineering Consultancy Fees issued by the Institution of Engineers Sri Lanka, it is authorized to pay a percentage of

the estimate. And also due to the difficulties in practicing other payment methods, the current method is resorted to. In order to carry out the process with maximum transparency, it has been informed to the engineer to prepare estimates using the approved building schedule of rates of the buildings department.

6.2

Budgetary Control

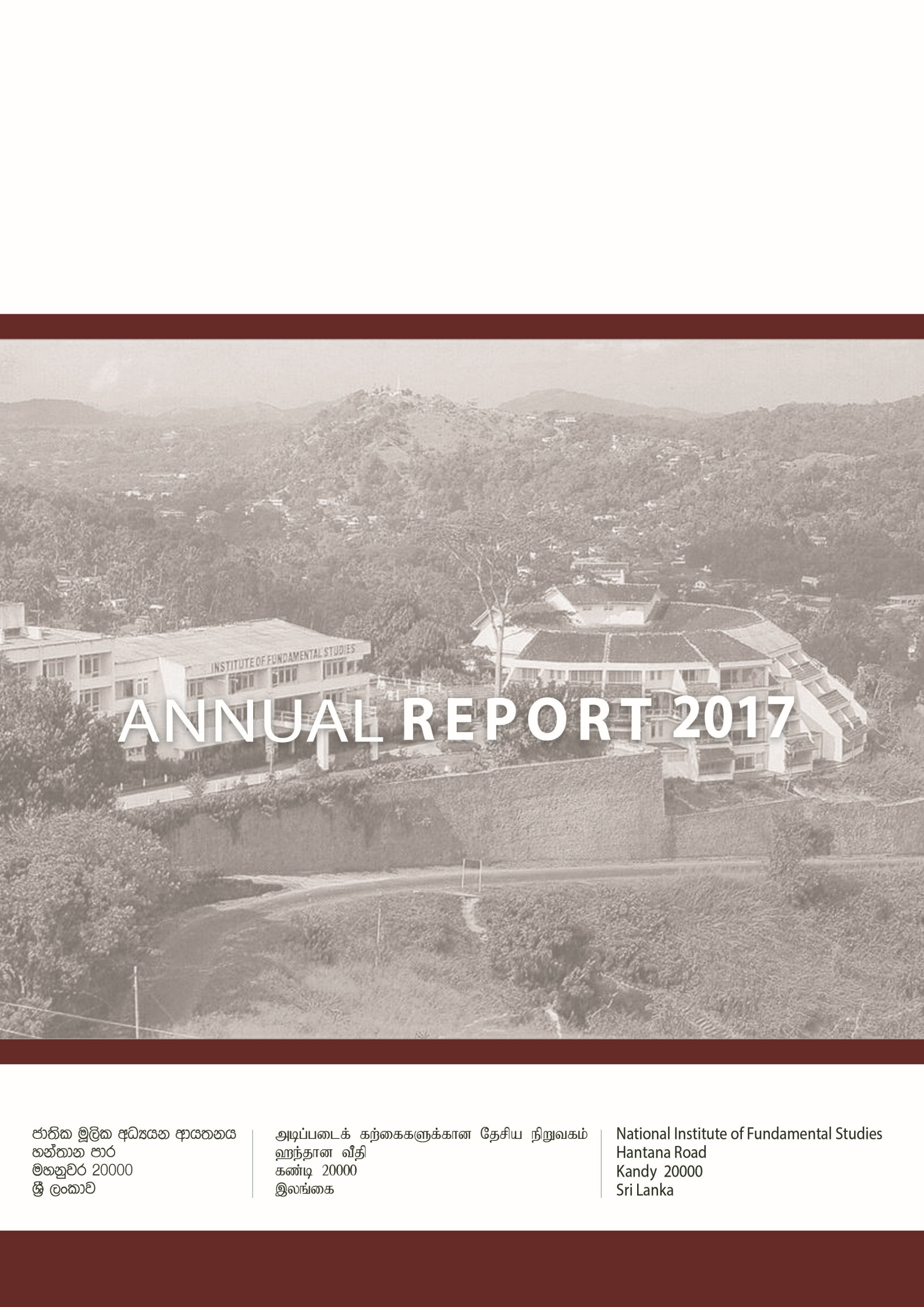
Noted to take necessary action to use the Budget as an effective control mechanism.

7

Systems and Controls

- (a) Noted.
- (b) Noted.
- (c) Noted.

Director/NIF
CEO/CFO of the Institute



ANNUAL REPORT 2017

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ஹந்தான வீதி
கண்டி 20000
இலங்கை

National Institute of Fundamental Studies
Hantana Road
Kandy 20000
Sri Lanka