

VIDYA

The Quarterly Newsletter of the National Science Foundation



Volume 21, No. 01 January 2019 ISSN 1391-4367

Turning over a new leaf



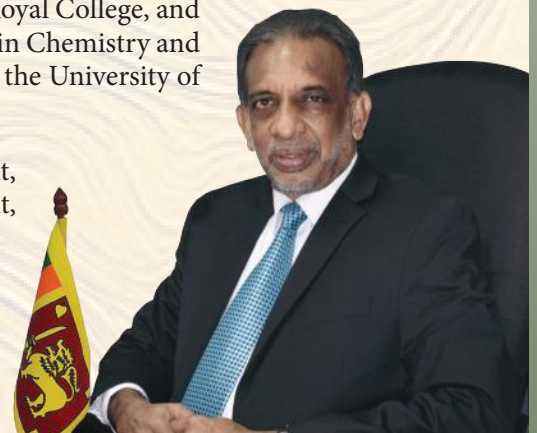
Prof. Ananda Jayawardane/ Director General of the NSF welcoming the Hon. Minister of Science, Technology & Research Mr Sujeewa Senasinghe to the NSF. The Secretary to the Ministry Mr Chinthaka S. Lokuhetti (Standing in the middle) also joined the visit.

As the new Minister of Science Technology and Research, Hon. Sujeewa Senasinghe takes the office, the NSF turns over a new leaf in promoting science and bringing the fruits to the country's industry and people targeting better outputs. On the 30th of January the Hon Minister visited the NSF to speak to the staff about his new S & T implementation strategies that would yield more benefits to the people in the country. Being a lawyer by profession and completely new to the subject field, the Hon. Minister has taken the challenge to lead the S & T community to greater heights. With the appointment of the new Chairman, Dr A.M. Mubarak to the NSF Board of Management, the staff of the NSF look forward to a renewed leadership to take forward the Institution's vision towards marking social prosperity.

Dr Azeez Mohamed Mubarak was the Director and Chief Executive Officer of the Industrial Technology Institute [(ITI) formerly CISIR] from 2002-2012. An old boy of Royal College, and an alumni of the University of Colombo, he holds a first class honours degree in Chemistry and a PhD from the University of Cambridge. He also had post-doctoral stints at the University of Maryland, USA and Royal Institute of Technology, Stockholm, Sweden.

He was the President, Institute of Chemistry, Ceylon in 1994, General President, Sri Lanka Association for the Advancement of Science in 2014 and President, National Academy of Sciences of Sri Lanka in 2016/17 and 2017/18.

Dr Mubarak is a Commonwealth Scholar and the first recipient of the National Award under the category "Outstanding Leadership in introducing Technologies" awarded by the Ministry of Science and Technology in 2005. He has served on several Presidential and Ministerial Task Forces and on Government delegations including Presidential Task Force on S & T Development, Ministerial Committee to formulate the National S & T



Dr A M Mubarak, The newly appointed Chairman of the NSF

Continued in page 02

Development Act No. 11 of 1994. He was a member of the Sri Lanka Delegation at the First Indo-Sri Lanka Sub-Commission Meeting on S & T Cooperation, and Indian Sethusamudram Ship Channel Project. He has served as a Member of the Council of the University of Colombo and the Boards of the National Science and Technology Commission, Post Graduate Institute of Science, Peradeniya, the National Engineering Research & Development Centre and the Rehabilitation of Persons, Properties and Industries Authority (REPIIA).

He has been an active sportsman captaining the University of Colombo in Cricket and Soccer while winning colours in Badminton and Hockey and with a prestigious 'Cambridge Blue' in Cricket.

Currently, Dr Mubarak serves on the Council of University of Sri Jayewardenapura, the Sri Lanka Accreditation Board as well as a Board Director on the EB Creasy Group of Companies and Chairman of Union Chemicals Lanka PLC.



Hon. Sujeewa Senasinghe addressing the NSF Staff



Subsequent to the speech, the Honorable Minister visited the National Science Library and Resource Center (NSLRC) and expressed his views to the staff on how the S & T information could be meaningfully delivered to the Chambers of Industries and the Private Sector, drawing attention to the global developments in the field.

National Awards for Science & Technology Achievements (NASTA Awards) 2018

The NASTA Awards are presented biennially for scientists and technologists who have significantly contributed to the socio-economic development of the country through application of S & T. Introducing many improvements to the criteria and process of evaluation, The 2018 Awards were given for the most prominent and worthy achievements. The stringent evaluation process took a considerable time period and with the help of a distinguished Panel of Judges representing different fields. In contrast to 2016, where only a Merit Award was selected out of 28 applications received under 10 categories, 80 applicants/ teams contested for the NASTA Awards 2018 under 13 categories as given below:

1. Individual/ team/ institutional outstanding leadership in promoting & developing S & T
2. Excellence in multidisciplinary team efforts in the application of S & T
3. Excellence in public-private partnerships built in the application of S & T
4. Excellence in international collaboration for advancement of S & T
5. Adaptation of technologies to large industries
6. Transfer of technologies to SMEs
7. Harnessing S & T for sustainable development
8. Innovative applications of advanced technologies
9. Value addition to local natural resources (biological, earth & marine resources *etc.*)
10. Development of viable substitutes for imports and acquired or adapted technologies resulting in successfully exported products/services
11. Outstanding S & T contributions having a significant impact on the nation
12. Mainstreaming indigenous knowledge for S & T development
13. Improvement of productivity, quality and competitiveness products/ processes/services through application of S & T



Prof. Ananda Jayawardane/ Director General of the NSF delivering the keynote speech at the Award Ceremony



The Award Ceremony of the NASTA Awards 2018 was held at the Presidential Secretariat on December 19th, 2018, HE Maithripala Sirisena the President of Sri Lanka, being the Chief Guest. The Secretary to the President, Mr Udaya Seneviratne also joined the Ceremony.

VIDYA

Volume 21, No. 01 January 2019



Prof. Athula Sumathipala, National Award winner under the Category “Individual/ Team/ Institutional outstanding leadership in promoting & developing S & T”



Under the Category “Value addition to local natural resources (biological, earth & marine resources etc.)” Dr (Mrs) G A Gunawardana, Dr M A R Priyanatha, Dr (Mrs) H G I K Hemamala, Dr (Mrs) K M S G Weerasooriya, Mr A A Vipulasiri, Mr S Rathakrishnan, and late Dr M C L de Alwis won the award for the project titled “Development and successful field application of a new vaccine against fowl cholera in poultry, Sri Lanka”



Mike Biotech Asia, The National Award winner under the Category “Development of viable substitutes for imports (acquired or adapted) and acquired or adapted technologies resulting in successfully exported products/services” for the project titled “Mass plant propagation by in vitro tissue culture technology”



Under the Category “Excellence in international collaboration for advancement of S & T”, Dr (Ms) Ilmi G N Hewajulige Senior - Deputy Director, Dr (Ms) Shanthi Wilson Wijeratnam - Former Additional Director, Mr Nisala Gunasekara, Research Scientist, Ms Yoga Milani, Research Scientist, Ms Shiranthi Perera, Senior Research Technologist, Mr Dineth Samarawickrama, Research Technologist, Mr Anura Sooriyaarachchi, Chief Engineer, Ms Manori Wijemanna, Senior-Deputy Director of the Industrial Technology Institute won the Award for the project titled “Developing and adapting new technology for adaptation and application in Sri Lanka to minimize postharvest losses”.



National Award winners and the winners of Merit Awards of 2018 together with the Merit Award winner of 2016 posing for the picture with HE the President and the Secretary to the President Mr Udaya Seneviratne.

The team consisting Prof. C B Dissanayake, Prof. Rohana Chandrajith, won the Merit Award 2018 under the Category “*Individual/ Team/ Institutional outstanding leadership in promoting & developing S & T*” for the project titled “*Pioneering studies on medical geology in Sri Lanka - Application of geology to health, disease and socio-economic development*”

The project titled “*Excellence in international collaboration*” conducted by the Institute for Research and Development in Health and Social Care (IRD) won the Merit Award 2018 under the Category “*Excellence in international collaboration for advancement of S & T*”



**Merit Award
Winners
2018 & 2016**



The team consisting of Dr (Ms) M T M D R Perera, Additional Director/ Department of Agriculture & Dr N Senanayake, Retired Additional Director / Department of Agriculture won the Merit Award 2018 under the Category “*Harnessing S & T for sustainable development*” for the project titled “*Mass rearing of parasitoids of major pests of crops of Brassicaceae family, diamondback moth, for sustainability and commercialization in Sri Lanka*”.



The Merit Award 2016 was presented to J Lanka Power & Energy (Pvt) Ltd. under the category “*Innovative applications of advanced technologies*” for the project titled “*Online electricity monitoring & controlling system*”

Research at Bench and Beyond

Early presence of humans in Sri Lanka and continuum of their existence towards Holocene



A view of the excavated rock-shelter called Lunugalge in Ilukkumbura of Balangoda.

A research grant awarded under the discipline of Indigenous Knowledge titled “*Climate change and the human adaptations in the early and the middle Holocene in Sri Lanka,*” was successfully completed in 2018. The Research Team consisted of Prof. Raj Somadeva, Dr T R Prematilleke and Dr Nimal Perera of the Postgraduate Institute of Archaeology.

This research project was aimed at studying the human existence and its continuity in Sri Lanka during the Holocene geological epoch. Early presence of humans in Sri Lanka during the middle and late Pleistocene has already been proven by archaeologists and physical anthropologists. However, the continuum of their existence towards Holocene has not been scientifically proven.



Some specimens of the excavated charred seeds recovered from the prehistoric contexts in the Lunugalge and Alugalge rock-shelters.

During the investigations done in the two-year period, five prehistoric cave occupations in and around Balangoda, associated with three distinct climatic zones, have been observed. Six excavations carried out during the project period have yielded a fairly large assemblage of artifacts which reflect the behavioral traits of prehistoric communities who occupied the investigated locations. Scientific dates (AMS) obtained have proven that all the caves excavated were inhabited by the prehistoric communities during the Holocene. Most striking evidence unearthed was a collection of plant residues (charred seeds) that has been dated to the mid-Holocene (4500 - 3450 BCE). Evidence reflecting an emerging new materiality of those prehistoric communities was identified. The sites and the artifacts together with Carbon-14 dates reiterate the fact that the hunter-gatherer/foragers of the mid/late Holocene had been receptive to the climatic changes of the contemporary period and the adaptive response is reflected in their material culture.

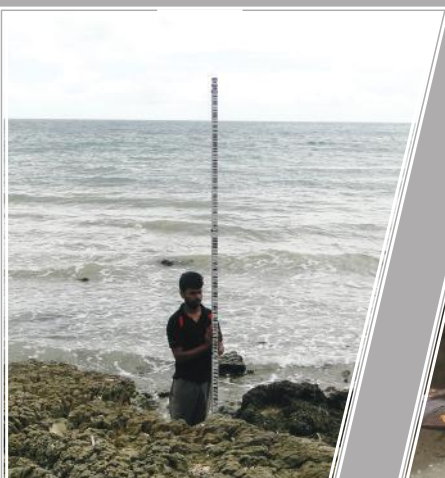
Measuring sea level variability contributing to urban planning and coastal zone management

Understanding that long-term sea-level variability is the key to recognizing future variability, a Research Grant awarded in 2014 to a team led by Dr Pradeep Nalaka Ranasinghe of Department of Oceanography & Marine Geology, University of Ruhuna was successfully completed in 2018 contributing to the development

of a long sea-level record for the Central Indian Ocean and to identify forcing mechanisms.

Warming of the atmosphere due to greenhouse gases and melting of polar ice is causing a significant rise in the sea-level. Reconstructions of sea level history in the Central Indian Ocean do not run beyond

Holocene due to lack of long-term records. Further, available sea-level history for the Central Indian Ocean runs into doubts due to inconsistency of available records for the Holocene. There have been several unresolved issues on Holocene reconstructions of the region. Accordingly, this study was carried out with the objective of



A



B



C

A - Measuring the height of the sampled in-situ coral heads; B - Studying buried corals at Polhena; C - Rotary core drilling of coral and limestone basement at Kachchativu Island

finding solutions to the said unresolved scientific problems as it would explain the impacts of global anthropogenic sea level rise to the coastline of Sri Lanka as well as South India.

According to the results, three phases of island formation during the Miocene, Pleistocene, and Holocene could be recognized in the Palk Strait area. Changes in sea level have resulted in these island formations. It was recognized that future anthropogenic sea level rise could submerge a large area of coastal lowlands in the South and in the Jaffna peninsula. This study also glimpsed the coastal landscape changes at the anthropogenic sea-level rise. According to the gathered data, coastal lowlands including Jaffna peninsula will be at risk with the rising sea level. This information can be used for urban planning and coastal zone management as modeling the coastal areas with accurate levelling data is essential to predict flooding areas at different levels of sea level rise in future.

WIPO mentoring programme facilitating technology commercialization

“Enabling Intellectual Property Environment (EIE)” is a multi-year project initiated by the World Intellectual Property Organization (WIPO) aiming at developing a local resource pool to facilitate Intellectual Property Management and Technology Commercialization. National Science Foundation selected by the WIPO & the National Intellectual Property Organization (NIPO) of Sri Lanka is one of the project partners involved in implementing the project.

The Technology Commercialization Mentoring programme is one part of this project initiated in 2018 by WIPO for partner institutions in some countries; Thailand, Philippines, Malaysia and Sri Lanka. Two

technologies developed under NSF supported projects; “Industrial scale coconut de-husking machine” and “Biological control of cabbage pests”, were among the selected out of many from all four countries for mentoring under this programme. The selection was based on the potential impact of the technologies to the society and economy.

The first mentoring session with the WIPO resource person was held on the 16th January 2019, through Skype. Project Team Members participated at this session and exchanged valuable information with the WIPO on IP management and commercialization.

Science for All

Facilitating Sports Science Research in Sri Lanka

Insightful results of a three-year research project conducted by Dr Upendra Wijayasiri, Head/ Sports and Exercise Medicine Unit, Colombo South Teaching Hospital, Kalubowila lays strong foundation for advancing exercise physiology and its application on Sri Lankan athletes. The National Science Foundation (NSF) conducted a highly insightful knowledge sharing session for local sports administrators, trainers and ground-level practitioners, sharing eye-opening results of a three-year research on exercise physiology of Sri Lankan athletes. The results indicate that Sri Lanka’s national level athletes and their custodians lack proper guidance and direction on how to apply science research findings and technology to improve athletic performance. This is expected to be the start of a steady revolution of physically progressing athletes displaying the right combination of strength, agility and stamina for the corresponding sporting discipline they undertake.

The knowledge sharing session organized by the NSF together with some of Sri Lanka’s leading medical experts was held with the objective of creating a collaborative network between sports administrators and medical experts in the



The esteemed medical experts Dr Himansu Waidyasekara, Senior Lecturer (Left) and Prof. Savithri W. Wimalasekara/Consultant Clinical Physiologist, Faculty of Medical Sciences, University of Sri Jayawardanapura (Middle) joined Dr Upendra Wijayasiri (Right) delivering speeches in the knowledge sharing session.

country. This in turn would emphasize the importance of exercise physiology, analyze the current status of our national athletes and most crucially, will help apply these new research findings for the ultimate betterment of sports and athletes in Sri Lanka.

The research was conducted from 2015 – 2017 with the overarching objective of determining cardiopulmonary (heart and lung) fitness among national level athletes engaged in running events. This is the first research study of its kind conducted on cardiopulmonary fitness of Sri Lankan athletes practicing multiple running disciplines. The study analyzed top 100 national level athletes, top 100 university level athletes and a control group of university students not engaged in regular sporting activities for comparison purposes.

The results of the study showed that Sri Lanka's national level athletes required immediate attention and guidance in improving performance through the proper application of exercise physiology in areas such as peak oxygen consumption, enhancing endurance and the overall “remodeling” of the cardiovascular system through appropriate and continuous training.

This program emerged as a result of the overseas training offered to Dr Upendra Wijayasiri under the Overseas Special Training (OSTP) grants scheme of the NSF, implementing the mandate as the apex body powering the promotion of science, technology and innovation in Sri Lanka.

Multidisciplinary policy research towards discouraging the use of polythene and plastics



The recent policy decision of the Sri Lankan government to discourage the use of polythene and plastic-based shopping bags and other related materials demands a major contribution from all the stakeholders concerned, to facilitate the transition from the use of non-biodegradable to biodegradable materials. The production of raw materials, processing, designing, manufacturing, and promotion of finished materials demands the involvement of researchers and others to provide inputs in different ways to reduce

adverse effects on the environment due to the excessive use of non-biodegradable materials. Their active participation in organizing awareness programmes will enable people to change their existing polythene and plastic usage patterns, thus playing an important role in facilitating the transition to the use bio-degradable materials.

The NSF conducted a brainstorming session on 'Facilitating the Transition from Non-biodegradable to Bio-degradable Materials in Sri Lanka' with the assistance of the NSF Working Committee on Social Sciences in November 2018 to share the knowledge and expertise on this important theme. During the discussions the areas to conduct multidisciplinary policy research were identified. Experts, policymakers and academics from various government institutions and universities attended this event.

Cutting the first turf in developing a research culture

Out of 572 applications received from the School Science Societies across the country, the NSF has selected the best 10 projects to take to the next level of the Science Research Projects Competition (SRPC). The SRPC is conducted annually by the Science Popularization Division starting from 2008. The aim of this exercise is to enhance innovative thinking, creativity and the exploratory ability of the school children in the country. Students from Grade 9 - 12 are eligible to participate at this competition. The students make multimedia presentations at the Step 1 of the competition and the 20 best projects are selected. At Step 11, the 10 best projects are selected based on poster presentations.

The NSF mentors all applicants giving training to design their projects and write research proposals, with constant monitoring of the progress. The training programmes were conducted in three districts; Colombo, Batticaloa and Kandy. The SRPC 2018 commenced on 01st August 2018 and the progress review and evaluation process were completed in December 2018.

The Step I was held in January this year where 55 project teams participated. Senior academics of relevant subject fields evaluated the proposals and selected the winners for the next layer of the competition held on 31st January.



School Children presenting their Science projects at the SRPC

Student Response System for measuring classroom responsiveness

A basic structure for multi-purpose student response system was developed and tested to conduct sessions with more than 100 students overcoming the difficulties faced with quiz mode teaching in a lecture theatre or in an examination setting. This device can be easily used to check the learning degree of students during a lecture/class room activity by using a few multiple-choice questions. How well the students have answered the questions can be immediately assessed for individuals as well as for the entire class or groups. During the project period, the device was tested for a group of 150 students. Hand-held slave units (Clickers) with user-friendly keypads and LCD display units were successfully fabricated and tested at the University of Ruhuna. The two-way communication capacity of the device is over 75 meters and the slave unit is rechargeable. The developed student response system is low-cost, flexible and can be easily customized. The objective of introducing this product is to upgrade the existing one-way teaching/communication system to a multi-purpose responsive system working in different modes; quiz mode, feedback mode and voting mode. The system was developed with the support of the technology grant awarded to a Research Team of the University of Ruhuna.



Hand-Held slave units (Clickers) with user-friendly keypads and LCD display units



Student using Clickers at lectures



Taking Science to Public

The NSF Science Bulletin “Vidurava” which is being published since 1978 is one of the oldest Science Magazines of the NSF that carries Science, Technology and Innovation information to many layers in the Sri Lankan society. The Magazine is published in three languages; Sinhala, Tamil and English. The quarterly publication will portray the theme “Built Environment” in the first issue in 2019, to be published soon.

Expressions of Interest are being called now from interested parties for articles for the second issue under the theme “Aviation Science and Technology”. More information in this regard is available at <http://www.nsf.gov.lk>.



Feature update for the year - 2018

Completion of Postgraduate Diplomas & Certificate Courses by NSF Staff Members

Congratulations to All !



Ms Chamika Dharmasena, Scientific Officer attached to the Science & Technology Policy Research Division (STPRD) of the NSF successfully completed her Postgraduate Diploma in Applied Sociology at the Department of Sociology, Faculty of Arts, University of Colombo with a Merit Pass and becoming the batch top. The course has given her the theoretical and practical insight into the subject field with exposure while enhancing the ability to critically analyze social issues and phenomenon with ultimate contribution towards the development of the country. The research part of the course was a sociological study on “Knowledge and Attitudes of Residents in Household Solid Waste Management in the Maharagama Urban Council Area”.



Ms Thilinakumari Kandanamulla, Scientific Officer attached to the International Liaison Division of the NSF, completed her Postgraduate Diploma in Education (English Medium) in 2018 at the Faculty of Education of the University of Colombo. Based on her research findings, she made a presentation under the title, “English medium science education at the junior secondary level of Sri Lanka: Problems and potential to assist through Information and Communication (ICT)” at the 16th Science Council of Asia Conference held in Colombo.

Ms Chamika Dharmasena (Top), Ms Thilinakumari Kandanamulla (Bottom), receiving their Postgraduate Diplomas at the Postgraduate Convocation of University of Colombo held on 12th November, 2018 at the BMICH



Ms R N N Gamage, Scientific Officer attached to the Technology Division also received her Postgraduate Diploma at the Postgraduate Convocation of the University of Colombo held on 12th November, 2018 at the BMICH

Ms R N N Gamage, Scientific Officer attached to the Technology Division obtained her Postgraduate Diploma in Health Development at the Faculty of Medicine, University of Colombo. This Postgraduate Diploma is equivalent to the level 8 of Sri Lanka Qualifications Framework (SLQF). During her studies, Ms Gamage has acquired a good understanding on concepts related to health, the dynamic nature of its determinants and its relevance to health in all policies.

She carried out her research project on the topic “Relationship between Physical Activity (PA) and Body Mass Index (BMI) and Their Associated Factors in a Middle-Aged Adult Population in Karapitiya, Sri Lanka.” The findings of her research resulted in one international scientific communication.

Ms Nadeeja Wickramarachchi, Senior Scientific Officer of the Technology Division successfully completed two on-line certificate courses conducted by the World Intellectual Property Organization (WIPO) with Distinction grades. She followed the PCT Distance Learning Course and was subsequently offered a scholarship by WIPO to follow the Advanced Course on patents. This training was facilitated by the National Intellectual Property Office of Sri Lanka (NIPO). The training has resulted in enhancing the services offered by the Technology Innovation Support Centres (TISC), of the NSF, the project supported by WIPO and the NIPO.



Ms Nadeeja Wickramarachchi, Senior Scientific Officer of the Technology Division, who has successfully completed two WIPO on-line certificate courses



National Science Foundation
47/5, Maitland Place
Colombo 07
Sri Lanka

Tel : 011-2696771
Fax : 011-2694754
www.nsf.gov.lk



Vidya Newsletter Editorial Board

Dr Thamara F Dias (Editor-in-Chief)
Dr Geethika Yapa (Co-Editor)
Dr Gowry Moorthy
Dr P R M P Dilrukshi
Mr Wasantha Anuruddha
Mr K G J Karunasena
Mr Manuja Karunaratne
Mrs Nadeeja Wickramarachchi
Mr Madhawa Perera

Type Setting and Page Designing
A Nilusha Perera