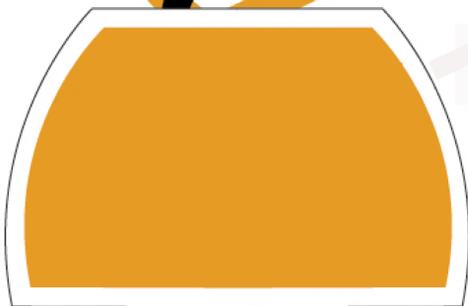


# *NSF Technology Awards*

## *2014 - 2017*



## INTRODUCTION

### NSF Technology Awards

The two technology grant schemes, “Support for Technology Development” and “Support for start-up businesses based on new technologies” are implemented with a view to support innovators to develop, assimilate and use technologies for wealth creation. The grant schemes are targeted at bringing locally developed technologies for socio-economic development of the country. Another aim is to motivate grant recipients to conscientiously maintain high standards of partnerships with the public and private sectors. This awards scheme was implemented for the first time in 2014 for successful technology grant recipients. One Award and one Certificate of Commendation will be conferred at this year’s ceremony.

# NSF Technology Awards - 2017

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**Project Title : Further development, quality upgrade of nucleic acid extraction kits (Viral RNA and human genomic DNA) and recombinant enzymes for commercialization**

**Grant No. : TG/2012/Tech-D/06**

#### **Outcome/s of the project:**

CeyGen Biotech (Pvt) Ltd developed and commercialized three quality certified products, ViroSpin™ viral-RNA extraction kit, GenoSpin™ genomic-DNA extraction kit and Recombinant ThermoRead™ Taq-DNA-polymerase. Together with this, CeyGen enhanced production capacity, developed infrastructure and set up advanced technologies that are required to manufacture high-tech biotechnology products. As CeyGen products are manufactured in Sri Lanka, the cost of CeyGen kits and reagents are approximately 35% of the price of similar imported products. Therefore, it is forecasted that there would be a total estimated saving of over Rs. 75 M (or equivalent foreign exchange) for one molecular lab within the next five years. The availability of low cost biotechnology products would enable health authorities to provide molecular-based diagnostics at an affordable cost to patients and researchers.

#### **ABOUT THE WINNERS**



**Prof. Ranil S Dassanayake** is a Professor in Biochemistry & Molecular Biology, University of Colombo and Scientific Co-Founder of CeyGen Biotech (Pvt) Ltd. He has been involved in research and development work related to molecular-based technology and services since 1995. He has published over 100 research articles in both international and local journals.



**Dr Jagathpriya Weerasena** is a Senior Lecturer at the Institute of Biochemistry, Molecular biology and Biotechnology, University of Colombo. He has served as a visiting scientist at the Genetic Centre, University of Uppsala, Sweden and Research Associate at the Department of Biochemistry, University of Colombo. He is a Scientific Co-Founder of CeyGen Biotech (Pvt) Ltd.



**Prof. Y I Nilmini Silva Gunawardene**, Professor in Molecular Medicine, University of Kelaniya and Scientific Co-Founder of CeyGen Biotech (Pvt) Ltd, has been involved in research and development work related to molecular-based technology and services since 1998. She has published over 100 research articles in both international and local journals.



**Prof. Aresha Manamperi** is a Professor in Molecular Medicine and Head of the Molecular Medicine Unit, University of Kelaniya and Consultant Molecular Biologist attached to CeyGen Biotech (Pvt) Ltd. She has over 15 years of experience in research and development work targeting molecular-based technology and services and teaching/training activities in Molecular Medicine.



**Mr Upul Tudawe** is the CEO/Director of CeyGen Biotech (Pvt) Ltd and Executive Vice President of Ceylon Hospitals PLC (Durdans Healthcare Group). He holds a MSc in Microbiology from Texas Tech University, USA as well as a BSc in Medical Technology from the University of Texas Health Science Centre, Houston, Texas, USA.

**Project Title : Development of an efficient coconut dehusking machine for industry**

**Grant No. : TG/2015/Tech-D/06**

**Outcome/s of the project:**

Addressing the issue of labour shortage for coconut dehusking in the coconut industry, Mr Bandara invented an efficient coconut dehusking machine. The dehusking machine consists of an electric motor (2HP) gearbox, electric switches and unique mechanism to dehusk a coconut in 7 seconds. Negotiations are in progress with relevant stakeholders to commercialize this invention.

**ABOUT THE WINNER**



**Mr K M S Bandara** completed a three year Machinist Special Course at Apprenticeship Training Institute (ATI), Moratuwa. Afterwards, he worked in both local and foreign institutions as a mechanist. For the above invention, Mr Bandara has acquired a patent and also won the second place at the “Sahasak Nimavum” National Exhibition in 2017. Currently, he owns a small Lathe Workshop, where he does all his inventions and other customer services.

# Certificates of Commendation

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**Project Title : Face ID: computer-based forensic facial reconstruction using 3D graphics**

**Grant No. : TG/2013/Tech-D/04**

### **Outcome/s of the project:**

Introducing a 3D computer graphics-based solution for forensic facial reconstruction, which is the process of recreating the face of an unknown individual from their skeletal remains, to the local forensic officials was the main aim of this project. The software applications and interfaces which were needed to support the automated tasks of the reconstruction process were developed with NSF funding. Data collection was done related to skin tissue thickness and facial components for the 20-30 age category and 5 cases were reconstructed using the new data values to evaluate the proposed process.

### **ABOUT THE WINNERS**



**Dr Anuja Dharmaratne**, previously Senior Lecturer at the University of Colombo School of Computing (UCSC) is currently at Monash University, Malaysia. She was the Principal Supervisor of the project when it was initiated as an undergraduate research project at the UCSC. She was the Team Leader of the project when it received the NSF grant to create software applications required to automate various stages of the introduced process.



**Dr Damitha Karunaratna**, University of Colombo School of Computing, took over the project from Dr Anuja Dharmaratne, as the Team Leader from 2015 to its completion. His expertise in computer science has been immensely beneficial for the success of the project.



**Dr K D Sandaruwan**, Senior Lecturer at UCSC, was an original member of the project team when it was initiated in 2012. Under his supervision, the undergraduate project won a number of awards and many articles were published.



**Prof. Muditha Vidanapathirana**, Faculty of Medicine, University of Sri Jayewardenepura, is the key Medical Advisor in this initiative, where his knowledge on the process of forensic facial reconstruction was vital for the success of this project. He has been instrumental in raising awareness of the project outputs among the medical community in Sri Lanka.



**Mr Roshan N Rajapakse**, UCSC. It was his final year undergraduate research project together with Ms Anuradha Madugalla, Ms Ishari Amarasinghe and Ms Vinavi Padmathilake, which was the inception of this initiative to introduce forensic facial reconstruction to Sri Lanka. He was involved as a Research Assistant during the NSF-funded stage of the project.

**Project Title : Fault detection, isolation and restoration using a multi-agent based distribution automation system**

**Grant No. : TG/2014/Tech-D/05**

### **Outcome/s of the project:**

The smart power unit is an intelligent equipment which can be used for fault detection, isolation and restoration. It is developed using the Multi Agent Systems technology. The system has an online current and power monitoring device to monitor the real-time data. The developed system can identify a fault in the distribution network in real-time. Restoration can be achieved through the developed device with relevant fine-tuning of the distribution system which has been developed to achieve high reliability. Failure of one of the communication devices can be detected by the closest working meter. Developed system leads to automatic transfer of data of child devices to the closest parent meter.

### **ABOUT THE WINNER**



**Dr K T M Udayanga Hemapala** received BSc Eng from the University of Moratuwa in 2004 and PhD from the University of Genova, Italy in 2009. He is a Senior Lecturer at the University of Moratuwa since April 2009. His research interests are in industrial robotics, distributed generation, power system control and smart grid.

**Project Title : Wireless pad-based vehicle weigh system**

**Grant No. : TG/2013/Tech-D/08**

**Outcome/s of the project:**

An indigenous pad-based weighing system was developed with the financial support of the NSF. The modular solution offers mobility, easy maintenance and a cost-effective viable solution as an alternative to conventional weigh bridges. The customer can adjust the number of pads to match the number of wheels of the vehicle. This enables weighing even a large vehicle in a single attempt, which greatly improves accuracy vs. the current Sri Lankan practice of adding piecemeal measurements when using weigh pads. Communication modules were developed to connect the pads wirelessly, improving ease of use while reducing the potential for damages.

**ABOUT THE WINNERS**



**Eng. Nalin D Karunasinghe**, MEng (Mechatronics, National University of Singapore), BScEng (Hons. Moratuwa), is a Scientist, Inventor and Developer of mechatronic solutions. He has more than 30 years of design experience and has won several international awards. He currently serves as a consultant for several public and private institutions.



**Mr Isuru Seneviratne**, BA (Hons) Computer Science (Amherst College, US), is an energy and resource investor based in New York City, USA. He is involved in project development on financial, IP and documentation aspects. He represented Sri Lanka at the International Olympiad in Informatics in 1997.



**Mr Nimal Sripali** followed a full-time 2-year course in Radio and Electronics at the Technical College, Maradana. He worked in the Metropolitan Agency and had training on Electronic Typewriters at the Canon Inc, Tokyo, Japan. He is working at the E-Net Solutions (Pvt) Ltd since 2006.

The cover features a large white circle on a background of green and grey. The text is centered within the white circle. The year '2016' is positioned below the main title. The bottom right of the white circle is decorated with a cluster of overlapping hexagons in various colors including light blue, orange, pink, and purple.

***NSF Technology Awards***  
***2016***

**Project Title : High performance lighter weight prosthetic foot based on hybrid nanomaterial filled natural rubber nanocomposite**

**Outcome/s of the project:**

A novel high performance and lighter weight prosthetic foot based on nanotechnology / nanomaterial approach along with improved processability was developed as an alternative to the present prosthetic foot produced by Ranaviru Sevana, Army Rehabilitation Center, Ragama. The hybrid nanomaterial filled NR nanocomposite with improved strength, better abrasion resistance and higher thermo-oxidative stability was developed for the outer layer of the prosthetic foot, whereas, nanostructured NR cellular compound with a lighter weight and with improved resilience was developed as the inner layer /component of the prosthetic foot. Based on the novel prosthetic foot developed, a patent application titled “Novel high performance, lighter weight prosthetic foot based on nanomaterial filled natural rubber compounds” was submitted to the Patent Office of Sri Lanka (Patent Application No. LK/P/1/18468).

**About the Winners**



**Dr Upul Ratnayake**, Team Leader of the project, obtained his PhD in Polymeric Nanocomposites from Loughborough University, UK. He has 20 years of experience on rubber processing technology, while his current research interest is on structure property relationship of rubber/latex nanocomposites. He had served for the Rubber Research Institute of Sri Lanka for 20 years and currently is the Head, Technical and R & D of Dipped Products Plc.



**Dr (Mrs) Dilhara Edirisinghe**, BSc, MSc, MPhil, PhD, Team Member of the project is the Head, Rubber Technology and Development Department, Rubber Research Institute of Sri Lanka. She has 25 years of research experience in the field of “Rubber Technology”. She has more than 50 publications and 04 patents to her credit. She won the National Science & Technology Award in 2010, Presidential Award in 2012 and the PRISL Merit Award in 2015.



**Mr W D M Sampath**, BSc, Team Member of the project is currently reading for MPhil degree at the University of Moratuwa. He is a Research Officer attached to the Rubber Technology and Development Department, Rubber Research Institute of Sri Lanka. He has four years of research experience in the field of “Rubber Technology”. He has more than 20 publications to his credit.



**Mr V G Mahesh J Abhayawardhana**, NDT (Chemical & Process Engineering) is a Technical Officer attached to the Rubber Technology and Development Department, Rubber Research Institute of Sri Lanka. He has contributed immensely towards the development of the high performance, lighter weight prosthetic foot.

**Collaborator** : Ranaviru Sevana, Army Rehabilitation Center, Ragama

**Grant Number** : TG/2012/Tech-D/04

*Certificate  
of  
Commendation*

**Project Title** : **COP Sayura: Three dimensional coastal surveillance system**

**Outcome/s of the project:**

COP Sayura is a real-time 3D Vessel Traffic Management System (3DVTMS) for ports and long coastlines. COP Sayura consists of the full-scale 3-Dimensional (3D) view of the harbor/coastline environment and the conventional 2-Dimensional (2D) traffic monitoring view. The observation capabilities of the solution are not limited to single static location. The operator has the freedom to select viewpoints and perspectives within the 360-panorama scene. 3D view enhances the user's situational awareness and increases the user efficiency. It supports planning and monitoring of real-time vessel traffic. COP Sayura has been successfully deployed at the Sri Lanka Coastguard Headquarters, Mirissa.

**About the Winners**



**Prof. Nihal Kodikara** is a Professor attached to the University of Colombo School of Computing (UCSC). His research interests include image processing, computer vision and computer graphics. He is presently the Head of the Modelling and Simulation Research Group of the UCSC.



**R/Adm. K R Senadheera (Rtd)** is the former Director General, Electrical, Electronics and IT, Sri Lanka Navy. He has over 33 years of service and has experience in R&D, management and administration, communication, networking and surveillance systems. He won the Vishista Seva Vibhushanaya medal in 2014.



**Prof. S R D Rosa** is a Professor attached to the Faculty of Science, University of Colombo. He has obtained his BSc from University of Colombo and MSc and PhD from University of Pittsburgh, USA. He is the former Head of the Department of Physics, University of Colombo. His research interests include gamma ray spectroscopy and physics education.



**Mr G K A Dias** received his BSc in Physical Science (1982) from the University of Colombo, PG diploma in Computer Studies from University of Essex, UK (1986), and MPhil from University of Wales, UK (1995). He is currently a Senior Lecturer attached to the University of Colombo School of Computing. His research interests are model driven software engineering, multimedia for education, modelling and simulation.



**Dr Chamath Keppitiyagama** is a Senior Lecturer at the University of Colombo School of Computing. He obtained BSc in Computer Science from the University of Colombo in 1997, MSc (2000) and PhD (2005) from University of British Columbia, Vancouver, Canada. He spent a year at SICS Swedish ICT AB as an ERCIM Marie Curie Fellow in 2013. He has research interests in distributed systems, computer networks, operating systems and information security.



**Dr K D Sandaruwan** is a Senior Lecturer at the University of Colombo School of Computing (UCSC). He obtained BSc from University of Colombo and PhD from UCSC. He won the TOYP 2014 Award (The Ten Outstanding Young Persons of Sri Lanka) under Technology Development and the Hiran Thilakaratne Award for outstanding postgraduate research during 2009-2011. He has research interests in real-time simulations, mathematical modelling and 3D graphics.

***NSF Technology Awards  
2015***

**Project Title : Manufacture and marketing of cost effective, environmentally friendly cooking stoves for domestic and commercial cooking purposes**

**Outcome/s of the project:**

A start-up company was established under this grant, which introduced a novel cooking stove based on coconut shell charcoal to the market. This new cooking stove offers the user a low cost alternative which is as convenient as cooking with LPG. The fuel source is coconut shell charcoal which provides higher temperature compared to wood and also generates less smoke and soot. In the first year of its operation, sales achieved by the start-up are 24,000 domestic cooking units and 30 commercial cooking units. Stoves are sold island-wide through appointed distributors. User survey conducted revealed that the use of the stove has brought cost savings of more than 80% compared to using LPG and users were satisfied with the efficiency. This project has created direct employment for workers engaged in the start-up business, as well as, enhanced income levels of village level pottery makers.

**About the Winner**



**Mr Riyad Ismail** has an academic background in science, finance and a MBA. He is engaged in developing and commercializing innovative products that have a positive social impact using locally available raw materials. He was awarded the National Science and Technology Award in 2008 for inventing EZ turbo charcoal stove.

**Grant Number : TG/2012/Start-up/01**

**Project Title : Improvement and field testing of a solar powered lift and carry type milking machine**

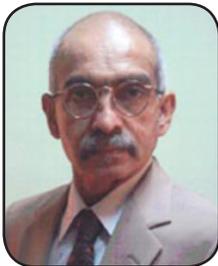
**Outcome/s of the project:**

Manual milking is a tiring operation and nowadays it is very difficult to find skilled manual milkers. The conventional portable milking machines have certain limitations, such as the machine being driven on wheels due to its heavy weight. It requires electricity to power the machine and the consumption is over 1000 W to build up the vacuum required for milking. Power generated from the main grid or electricity generator is mandatory and therefore, the cost is not affordable to small scale milk farmers. A novel solar powered, lift and carry type milking machine with 10 L capacity was developed to address the above mentioned issues and ergonomically improved by checking the durability of parts to maintain udder health of cows to avoid spread of mastitis. The machine can be operated using low energy of 60 W. Battery charging can be done using a 10 W photo-voltaic solar cell or a low power (1A) AC battery charger.

**About the Winners**



**Dr K S P Amaratunga** is a Senior Lecturer at the Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya. He graduated from the same faculty in 1989 and completed MAgri (1991) and PhD (1993) at Kyushu University, Japan, in the field of Agricultural Process Engineering. He has won the Presidential Scholarships in 2002 for his contribution to the field of Agricultural Process Engineering and completed postdoctoral fellowship at University of California Davis, USA, in 2006.



**Dr K F S T Silva** graduated with BVSc in 1978 from Faculty of Veterinary Science, University of Peradeniya and joined the Department of Animal Science, Faculty of Agriculture, University of Peradeniya as a Lecturer in 1980. He completed MSc in Dairy Microbiology at University of Arizona, USA and PhD in Microbiology at University of California Davis, USA.

**Grant Number : TG/2011/Tech-D/02**

**Project Title : Scaling up the invention of spherical container for natural rubber latex industry**

**Outcome/s of the project:**

A spherical latex container was designed to reduce material wastage which occurs in natural rubber latex processing from the point of tapping to maturation. A spherical tank of 21,400 L was fabricated and installed at Lalan Rubbers (Pvt.) Ltd, Pasyala, which is used as a maturation tank. Further, a mould for 1500 L spherical tank was designed for roto-moulding and 1500 L tanks were manufactured at Richard Pieris Polymers (Pvt.) Ltd., to be used as bulking tanks. New design is also equipped with ammonia feeding system, where the gaseous ammonia is injected into the maturation latex from the bottom of the tank by using a stainless steel pipe and nozzle assembly. Cost saving per dry tonne of centrifuged latex manufactured in terms of coagulated and left over rubber, ammonia and labour was accounted for Rs 121/-, Rs 44.32/- and Rs. 73/- respectively. Accordingly, there is a saving of Rs. 238/- in total per dry tonne of centrifuged latex. The system brings economical advantage over the existing units (cylindrical-horizontally arranged, and rectangular tanks), while ensuring the operational convenience in ammonia feeding and tank cleaning process.

**About the Winner**



**Mr Sunil Somasiri Gomes** holds Diploma in Mechanical Engineering and Diploma in Rubber Technology from University of Moratuwa. He has been serving in the capacity of Cleaner Production Consultant/Evaluator/Resource Person at National Cleaner Production Center, Sri Lanka, from year 2006 to date. He has been conferred with many awards from University of Moratuwa, Sri Lanka Inventors Commission, Sri Lanka Association for the Advancement of Science for the above invention.

**Collaborator : Rubber Research Institute**

**Grant Number : TG/2012/Tech- D/02**

**Project Title : Novel accessible technologies on touchscreen devices****Outcome/s of the project:**

The output of this project is a Virtual Braille Keyboard (VBK), 'iBrailier', which enables blind users to use modern touchscreen devices (iPads, tablet PCs, etc.) efficiently and effectively. The difference in 'iBrailier' is that the keys form around the fingertips when they are placed on the screen. If a user loses his way, he simply lifts his fingers from the screen and places them down again. The 'iBrailier' also has an easy undo/redo function that requires a simple clockwise or counterclockwise twist of a single fingertip across on touchscreen. A blind user can cut, copy and paste on the device. The product is commercialized and can be downloaded from the Apple app store. So far 9,000 users have purchased this app from the app store and 6,000 users are currently using the app (free of charge) at various blind institutes. It is envisaged that with introduction of this innovative product, blind community will be more encouraged to use modern ICT to enhance their employability for socio-economic benefits.

**About the Winner**

**Dr Sohan Dharmarajah** is the CEO at Neotericity, a boutique consultancy providing niche analytics solutions such as, fundamental research (mathematics, statistics, optimization), domain knowledge (finance, marketing) and high performance computing to solve problems ranging from automation and marketing, to image processing and credit scoring. His work has been featured by the BBC, NPR, Wired and Endgaget. He holds MSc in Optimization from MIT and PhD in Computational Mathematics from Stanford University, USA. Before returning to Sri Lanka, he worked at Goldman Sachs and the US Department of Defense.

**Grant Number :** TG/2012/Tech-D/03

**Project Title : Assessment of socio- economic viability of simplified hydroponics to improve the household food production and to develop a strategy for commercialization**

**Outcome/s of the project:**

Addressing critical issues in agricultural practices viz, limited land availability, water scarcity, uncontrollable level of application of pesticides, a simplified hydroponic agriculture system was developed and tested. The trials were conducted with individual households and other community groups in Colombo and Kaluthara districts. Demonstration gardens were set up in these districts in home gardens, schools and government institutions. This is a system where plants are grown in wooden or rigifoam boxes in an inert grow medium (substrate) supported by a patented nutrient solution. Different crop types; veraniya chillies, cabbage, capsicum, cauliflower, tomatoes, brinjols etc., were grown with satisfactory crop yield per cycle. The system requires less consumption of resources, labour and time for maintenance of crop production and therefore, brought attraction of individual households, busy professionals and disabled people. The entire system as a package is identified as one of the best commercial output of technology projects.

**About the Winners**



**Dr Susil Liyanarachchi** holds MSc in Agriculture and PhD in Agricultural Biology from the Institute of General Genetics, former Soviet Academy of Sciences. He started his professional carrier as a Research Fellow attached to the Institute of Fundamental Studies (IFS) in Kandy. He is currently a freelance consultant on program evaluations and participatory action research on social development.



**Mrs Janakie Saparamadu** holds BSc, MSc and MPhil in Analytical Chemistry from the University of Colombo. She is currently working as a Senior Lecturer attached to the Department of Chemistry, Open University of Sri Lanka and is the recipient of two national patents for developing a nutrient management system for simplified hydroponics.

**Grant Number :** TG/2012/Tech- D/07

**Project Title** : **Development of an *Aloe vera* (*Aloe barbadensis* Miller) incorporated ready-to-serve beverage (for product development at scaling up level)**

**Outcome/s of the project:**

An *Aloe vera* incorporated ready-to-serve beverage was developed as a measure for treating type 2 diabetes mellitus (T2DM). The effect of thermal treatments on bioactive constituents and the effect of pectinase enzyme treatment and pasteurization on the product quality were determined prior to product development. The optimum sucralose level to be incorporated to the anti-diabetic formula of the beverage was determined. A beverage with 150 mg dm<sup>-3</sup>, 0.15% w/v citric acid and 0.10% v/v orange flavour imparted desirable flavor that reduces the lingering after taste of sucralose was developed as the final product. Follow up actions are directed towards shelf life evaluation and clinical trial to evaluate the effect of anti-diabetic formula on newly diagnosed type 2 diabetic mellitus.

**About the Winners**



**Prof. Ayanthi N Navaratne** obtained a BSc (Chemistry) in 1984 from the University of Peradeniya and MSc (Inorganic Chemistry) and PhD (Analytical Chemistry) in 1989 and 1992, respectively from the University of Hawaii at Manoa, USA. She is a recipient of Excellence in Teaching Award from the American Chemical Society(1989), TWAS-NSF Young Scientist Award (2001), NSF Research Award (2013) and several Presidential Research Awards.



**Prof. D C K Illeperuma** attached to the Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya works as the professor in Food Science and Technology since 2003. She obtained PhD in 1994 (Postharvest Technology) from University of Maryland, USA, MSc in 1987 (Agriculture-Food Science and Technology) and BSc in 1983 (Agriculture, specialized in Food Science & Technology).



**Dr K A Naser** is a Consultant Physician attached to the Teaching Hospital, Peradeniya and currently works as the Consultant Physician at King's Mill Hospital, Sutton in Ashfeild, Nottinghamshire, UK. He graduated with MBBS (University of Jaffna) in 1995, MD (General Internal Medicine), University of Colombo in 2004, MRCP (UK), FRCP (Glasg), FRCP (Lond) and FACE (Fellow of American College of Endocrinology).

**Collaborator** : Nature's Beauty Creations Limited

**Grant Number** : TG/2012/Tech-D/11

*Certificate  
of  
Commendation*

**Project Title : To grow the algae *Spirulina* to overcome malnutrition in children and pregnant and lactating mothers in villages in Sri Lanka**

**Outcome/s of the project:**

*Spirulina* is a single celled blue - green algae that thrive in tropical, alkaline-fresh water bodies. *Spirulina* is 65-71% protein and one of the few plant sources of vitamin B12, usually found in animal tissues. This project carried out mass cultivation of algae *Spirulina* in tanks, to produce and deliver a dried and powdered end product to local market at an affordable price as a food supplement. The physical and chemical environmental factors were tested and optimum cultivation conditions were identified. Reliable methods were identified to harvest, dry and powder the fast grown algae. The final product was tested for the presence of major, minor and toxic chemicals at laboratories of Institute of Fundamental Studies (IFS) and the quality was assured. Packing and storing parameters were developed. Follow-up activities are focused on producing value added products like palatable tablets or capsules for using *Spirulina* powder at commercial scale.

**About the Winner**



**Major General (Rtd) W J T K Fernando** is an Electronics and Electrical Engineer who had an illustrious career in the Sri Lanka Army. On retirement he joined the Sultanate of Oman's Land Forces Army as a consultant. On his return he joined the Swarajya Foundation (SF) that was working for the benefit of the poor villagers.

**Collaborator :** Institute of Fundamental Studies

**Grant Number :** TG/2012/Tech-D/09

# **NSF Technology Awards 2014**

**Project Title : Manufacturing an environmentally friendly and safety cargo boat for local transportation**

**Output of the Project:**

Amongst different transportation modes, internal water-way transportation has been considered as a cost effective way of passenger and cargo transportation. However, with the development of road construction, the use of internal water-way transportation has become redundant in Sri Lanka. Moreover, the traditional motor boats available in the market are not permitted to be used in internal water-ways due to damage caused to the banks by wave generation. The grantee has invented a solution to the problem by developing a prototype made by replacing the standard “V” shaped hull with non-symmetric twin hulls fixed inversely, allowing the water to travel through the hollow mid section of the hull, thereby preventing the formation of waves to the sides of the boat. In addition, the propeller set in the middle of the boat further cuts the wave, minimising even the ripples caused while the boat is moving at high speeds. To avoid sinking of the boat, poly-urethane foam has been used to fill the space in-between. Further, up-trust about 6000 Kg is generated on one side of the boat and since total weight of one side of the boat is around 2000 kg, it is assured that the boat will not sink at any emergency situation. The boat can carry passengers up to 50 numbers or 4000 Kg of cargo. A patent for the prototype is pending. This invention has attracted many people and now there is a great demand from local and foreign tourists for recreational tours. With that demand, he now has partnered with a local hotel industry to manufacture many boats of the same nature to be used islandwide.

**About the Winner**



**Mr I S W Karunatilake** is a partly qualified Accountant and has served in many places in this profession. He hails from a family that operated a passenger and cargo ferry on Kalu Ganga during the first half of the twentieth century. However, to prevent river bank erosion, new rules and regulations on inland water- way transportation vessels were imposed affecting the family business. Mr Karunatilake, with his innovative thinking found a solution to the problem to keep his family business unaffected. Accordingly, he introduced the new concept of asymmetric twin hull design for the boat for which intellectual property right is pending.

**Grant Number** : RG/2008/SI/01

## Project Title : Quality improvement of prototype diesel fuel pump test bench

### Output of the project:

Fuel injection pump is the heart of diesel engines, which directly influence the quality of the work, such as the size of the accelerated performance of diesel engine, fuel consumption, and exhaust emissions. Due to low price of diesel fuel compared to other liquid fuels, it is being used in equipment, devices in many sectors ranging from transportation to agriculture. The poorly maintained injectors cause dribbling and low fuel efficiencies. It is therefore essential that the diesel pump is properly calibrated and serviced to ensure that the injectors are delivering the right quantities of fuel at correct pressure. In this context, diesel fuel pump test benches are used for servicing inline and rotary pumps. DC drive, variable pulley and AC inverters are used as drive systems in these machines. Local market is inundated with many imported units of such types. Introducing a locally manufactured fuel pump test bench with an AC inverter to the market would be a better option for those who are involved in the business in terms of cost and maintenance. The prototype diesel fuel pump test bench with the AC inverter developed under the support of the grants scheme, "Support for Technology Development", fulfills both these aspects. The use of an AC inverter brings the advantage of easy control of speed variations, minimizing power loss, reducing the space required as the pump drive system is directly connected to the motor shaft unlike other systems with belt or variable pulleys.

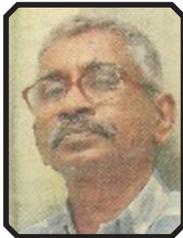
Test bench's main parameters are as follows;

Main motor power (kw)	11
Power of fuel pump motor (kw)	0.75
Scope of rotate speed (r/m)	0-4000
Number of cylinders	8
Height of principal axis center (mm)	125
Filter oil precision of test bench (mm)	4.5 - 5.5
Volume of big and small volumetric cylinder (ml)	75 - 16

Volume of fuel tank (L)	60
Low pressure of fuel oil pressure (Kgcm <sup>2</sup> )	0.7
High of fuel oil pressure (kgCm <sup>2</sup> )	45
Control temperature of fuel (°C)	40 ± 2
Flywheel inertia (kg*m)	0.29
Scope of rack bar stroke (mm)	0 - 25
DC electrical source (V)	12 / 24
Negative pressure of air supply (M Hg)	0 - 76

### About the Winner

**Mr S I Uyanhewa** holds Certificate of Automobile Engineering from the German Technical Training Institute. After conducting experiments and trials to control the speed of this kind of machines, Mr Uyanhewa produced the first machine in 1984 and sold it to a local company at one tenth the cost of an imported machine at that time. Subsequently, he has traded many such machines with different drive systems: "V belt", "Variable pulley" to nearly 100 places with the brand name "Hartess", including Sri Lanka Transport Board, Sri Lanka Army and Sri Lanka Navy. Mr Uyanhewa's fervent hope is to bring more improvements to the new test bench while capturing the local market for his new products.



Grant Number : TG/2011/Tech-D/01