



Daily News

# Vidya

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

## Dialogue with UNESCO Director General

Pictures - Gayan Pushpika

Science Dialogue with  
**UNESCO**  
Director General



At the meeting between the Director-General of UNESCO, Irina Bokova and Sri Lankan scientists, organized by the National Science Foundation and with the advice of the Minister of Science, Technology and Research Susil Premjayantha



# For the first time in history Sri Lanka to hold International Science and Technology Forum

W.A.S. Nisansala Kumari

All preparations have been made to hold an International Science and Technology Forum in Sri Lanka for the first time in the history of the country under the aegis of the Minister of Science, Technology and Research Susil Premajayantha. The inauguration of this Forum, to be held from 07<sup>th</sup> to 10<sup>th</sup> of September will be held at Nelum Pokuna Theatre, Colombo, will be held under the aegis of the President and the Prime Minister.

The main objective of this Forum is fulfilling the necessary requirements for, and enhancing the ability of Sri Lanka as a country to reach the aims in parallel to the progress the country has achieved in the fields of science and technology at international level. At this Fo-

rum, where about 700 Doctors and Professors including international leaders, scientists and Sri Lankan scientists and 100 international scientists are scheduled to participate, it is expected to discuss the place of Sri Lankan scientists in the international science field and the tasks they are perform-

ing for the world. The theme of the Forum is "Harnessing Science Technology and Innovation for Sustainable Development." The Forum will consist of four main sessions and 23 small group

technical sessions. Another specialty of this Forum is that arrangements have been made to open its doors to the future generations. Accordingly, over 500 school students and undergraduates have been given the opportunity to participate in this Forum.

## NERD Center marks 42<sup>nd</sup> anniversary

The National Engineering Research and Development Center (NERDC) that is massively supporting the socio-economic advancement of the country through engineering technology while becoming a center of excellence in engineering, research and development in South Asia, recently marked its 42<sup>nd</sup> anniversary. The NERD Center presently operating under the Ministry of Science, Technology and Research was estab-

lished on 14th August 1974 under the State Industrial Corporations Act (No. 49 of 1957). The National Engineering Research and Development Center is aptly carrying out its responsibilities with the objective of engaging in research and development activities that would have a direct bearing on the industrial development of Sri Lanka and on the

improvement of the living standards of the people, and thereby develop technologies that would help in the sustainable utilization of her human and material resources towards the economic development of the country under the guidance and supervision of the present Chairman W.J.L.S. Fernando and Director General Eng. D.D. Ananda Namal.



Ministry of Science, Technology and Research

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# A Ministry Delegation visits India

The 3<sup>rd</sup> Meeting of the Sri Lanka India Joint Committee on Science and Technology was held on 4<sup>th</sup> - 5<sup>th</sup> August 2016 in New Delhi, India between the Ministry of Science, Technology and Research, Sri Lanka and the Department of Science and Technology India. During the meeting a new Program of Cooperation (POC) was discussed and concluded.

The New POC addresses many new areas of cooperation and both Parties agreed to actively take part in implementing the POC. The areas agreed include Food Technology; Plant based Medicine; Metrology; Space Research and Application; Robotics

& Automation and Industrial Electronics. For most of these areas, Indian Scientists are very strong and Sri Lanka will be a beneficiary. The scientists included in the Indian Delegation agreed to fully support in Capacity Building of Sri Lankan Scientists, Technology Transfer and Joint Scientific and Technological Projects. Apart from these activities the two parties agreed to exchange experts and practitioners, hold joint workshops and symposia and invite researches for fellowship programs. The Sri Lankan Delegation consisted of R. Wijialudchumi, Secretary, MSTR, Renuka

Amarasinghe, Additional Secretary, MSTR, Eng. Sanath Panawennage, DG, ACCIMT, Dr. Sirimal Premekumara, DG, ITI, Dr. Muditha Liyanagedara, Director, NASTEC, Himali W. K. Athaudage, Director, MSTR and Manouri Mallikarachchy, Minister Counselor, High Commission of Sri Lanka, India while the Indian Delegation was headed by Dr. Arabinda Mithra, Advisor, DST, and other officials from the DST with Officers from the Defence Research Laboratory, National Innovation Foundation, Council of Scientific and Industrial Research, Department of Space and National Institute of Food Technology Entrepreneurship and Management. During the meeting the Indian side invited Sri Lankan School Students and Undergraduates to participate in the National Children Science Congress, Festival of India Innovation and India Science Fair. The Sri Lankan side invited a delegation from India to participate in the STS Forum which will be held from 8<sup>th</sup> to 10<sup>th</sup> September 2016.

On 5<sup>th</sup> August 2016 the Sri Lankan side visited the National Research and Development Centre, New Delhi, JSS Academy



of Technical Education and Centre for Development of Advanced Computing in NOIDA. The three organizations have different modes of operating Incubation Centres and the discussion held were very insightful for Sri Lanka as we are planning several Incubation Centers in the country. JSS Academy of Technical Education is providing business space for entrepreneurs to develop their ideas in the IT field. The students studying in the college also have a chance to interact with entrepreneurs and can develop their own ideas. Centre for Development of Advanced Computing had taken up many e-projects and had successfully developed many e solutions for the Private Sector as well as the government. They also provide space for incubation. The National Research and Development Centre has a mandate to develop, produce and commercialize marketable technologies. They offer the linkage between the R&D Institute and the Industry.

**Himali W. K. Athaudage**  
Director - Technology and  
Research Section



## Meteors and meteoroids

The solar system is filled with space debris left

# Meteor Showers

The Perseid meteor shower happens when the Earth crosses the orbit of the Comet Swift-Tuttle. Scientists have predicted that, for 2016, the Perseids will be visible from July 13 to August 26, with peak activity on August 12. Astronomer Bill Cooke of NASA's Meteoroid Environment Office (MEO) located in NASA's Marshall Space Flight Center in Huntsville, Alabama, predicted that from the midnight of August 12 to the dawn of August 13, observers will get the opportunity of observing about 200 meteors per hour. But, according to the reports of Sri Lankan observers, generally about 20 meteors per hour were observed.

over from after the planets were made and on their different orbits through the universe, some get attracted by the gravity of the earth and burn up due to friction when they enter the earth's atmosphere. They are called meteorites and when several of them occur it is called a meteor shower.

## Meteor showers

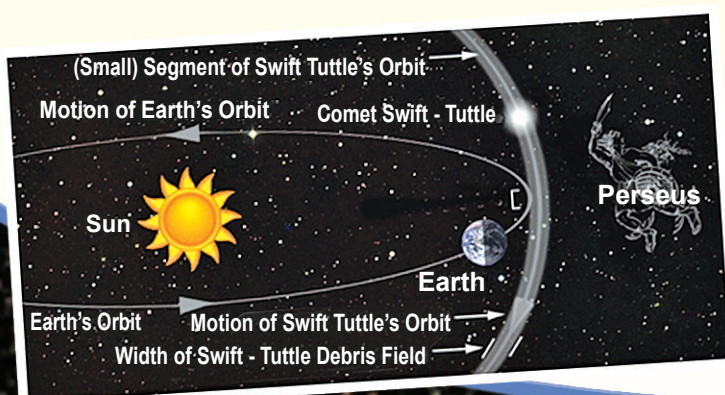
Meteors and meteoroids, that are commonly called 'Shooting Stars,' can be usually observed by the naked eye. Anybody will be able to see the meteors streaking like arrows of light towards the earth. These meteors travel from the

upper atmosphere to earth at a speed of about 15 kilometers per hour and disappear in less than a second leaving no trace. There meteors travelling to earth hits the atmosphere about 100 kilometers above the earth and burn up. Even though meteors and meteoroids can be observed at any time of the year, the most suitable time to observe them is during a meteor shower. These meteor showers can be observed every year during the same period because the earth, in its orbit, passes through trails of debris left behind by a comet. Even though about 20 meteor showers can be observed in an year, close to 50 meteors per minute can be observed in only a few of them.

## How to observe a meteor shower

No special equipment or knowledge of constellations is necessary to observe a

meteor shower. A dark place open to the sky should be selected to observe a meteor shower. An area of open sky is necessary because these meteoroids travel across many stars and in various directions. Cameras equipped with field lenses have provided a good opportunity to photograph this 'Perseid' Meteor Shower.



**Chinthana Wijayawardhana**

Space Technology Applications Division  
Arthur C. Clarke Institute for Modern Technologies



#### ◆ What is this Science and Technology Forum to be held in Sri Lanka in a few days' time?

The Ministry of Science, Technology and Research has taken steps to hold a Science and Technology Forum of international level in Sri Lanka for the first time in history. The inauguration ceremony is planned to be held at the Nelum Pokuna Theatre at 5.00 pm on the 07<sup>th</sup> of September under the aegis of the President and the Prime Minister. About 1200 eminent personalities consisting of 700 Sri Lankan scientists, 100 scientists from 17 countries and invitees will be participating in this Forum.

The first session of this Forum will be held at Waters Edge on 08<sup>th</sup> September under the aegis of the Prime Minister and the participation of 800 scientists. This Forum will consist of 46 such sessions. They are scheduled to be held as small group technical sessions under various topics of importance to the society. All sessions will be moderated by local and foreign professors and scholars of the field. This Forum, themed "Harnessing Science Technology and Innovation for Sustainable Development," will be conducted along four main fields with sub-topics.

#### ◆ What are the objectives of the Forum?

After this Forum being held for three days, we are expecting to issue a "Colombo Resolution on incorporating Science Technology and Innovation" for the development of the country. Through that, we will be working to acquire the highest technical knowledge such as Nanotechnology, Bio-Technology and Robotics operating based on new technology. Furthermore, it is expected to bring the new inventions based on scientific research to the commercial level and establishing a tradition of research in the country is another main objective of this Forum. Likewise, there are several institutions conducting research under the Ministry. Research projects are being conducted at our universities. Research projects are also conducted relevant to various State Ministries. As an example, research relevant to tear, rubber and coconuts are being conducted under the Ministry of Plantation Industries. Research projects are also conducted by the Ministry of Agriculture. Accordingly, the Deans of all universities and relevant personnel will be participating in this Forum. We have scientists who furnish us with research results annually. We have reserved space for all those persons at this Forum.

Another major objective of this Forum is propagating science and technology as a country. It is easy for us to achieve that objective.

#### ◆ What is the backing this Forum will provide to attract the future generation to

#### the science and technology subject field?

Youth interested in the subject field of science and technology will be provided

participate. Also arrangements have made to get batches of 50 students each to participate in the sessions to be held at the Waters Edge depending on the availability of space.

**“The inauguration ceremony is planned to be held at the Nelum Pokuna Theatre at 5.00 pm on the 07<sup>th</sup> of September under the aegis of the President and the Prime Minister. About 1200 eminent personalities consisting of 700 Sri Lankan scientists, 100 scientists from 17 countries and invitees will be participating in this Forum.**

with a great opportunity through this Forum. Accordingly, 20 students out of those who are following the G.C.E. (Advanced Level) Science Stream and have been awarded are provided with the opportunity to participate in the inauguration ceremony. Furthermore, opportunity has been provided for 200 university students representing Science Faculties of their respective universities to

#### ◆ After this Forum, what will be the contribution to the country's development through expected goals?

We have established specialized goals for the coming five years after this Forum. One matter of importance is how the technologies of modern science such as Robotics and

Nanotechnology can be used practically in day-to-day life. These technologies are being used, especially in the medical field, in developed countries. If we also can reach those fields, we can achieve the results of the development of those fields.

There are a large number of people educated in our country living and working overseas. We are also getting them to participate in this Forum. In the future, we will take steps to bring them down to Sri Lanka annually and get them to work together with the research scientists of this country thereby thus connecting to the world.

We will only be able to propagate the subjects of science and technology and acquire the relevant knowledge existing in the world through the holding of such fora.

#### ◆ What is the contribution of science and technology to the country's economic development?

The contribution of science and technology to the country's development is very high. As an example, when the nanotechnology of Slintec is taken, research and inventions are carried out by the State sector and the private sector, in collaboration. A number of renowned companies have joined it. Our people are conducting research for them. They bear half the costs of conducting research. If textile technology is taken as an example, now there are methodologies to prevent cloths getting wet even is water falls on the cloths. It is being done through nanotechnology.

Medicines are being prepared from cinnamon to control diabetes. How can asbestos be processed so as to be non-carcinogenic? Research is being conducted at present on that. Furthermore, if you take fertilizer, one sugar-packetful is being used for several acres. Graphite is extracted from plumbago more efficiently through nanotechnology. In this way, science has been utilized for the advancement of every field such as health, industry and economic in the country. Furthermore, we are selling the technologies we invent to other countries. Through that our country is getting valuable foreign exchange. The revenue the country is earning from tea, rubber and coconuts is not sufficient like it used to be in the past. As an example, the Industrial Technology Institute discovers methodologies of food preservation for things such as coconut water. Other countries buy that technology. That should happen today for the development of the country. We can stop losing foreign exchange by exporting value-added raw material.

**W.A.S. Nisansala Kumari**  
Picture – Gayan Pushpika



## Technology Park & Museum



expanded from beginning to the present stage. Hence, this Science Park & Museum will be beneficial for people who are searching for knowledge on new and indigenous technologies.

The Technology Park constructed in 1999, in parallel with the 25th Anniversary of the NERD Centre and the Engineering Museum established in 2013 are very popular among school children as well as other interested parties. They all have the opportunity to gain knowledge on NERDC developed technologies having a facility of practical demonstrations for the same technologies. In addition to that, there is a facility providing understanding to how our indigenous technologies

National Engineering Research and Development Centre of Sri Lanka (NERD Centre) was established in 1974 in accordance with the provisions of the State Industrial Corporations Act No. 49 of 1967 and now it is functioning under the purview of the Ministry of Science, Technology and Research. NERDC is one of the premier engineering institutions established under the aforesaid Act. To provide an institutional mechanism needed for the progressive development of indigenous technology, by developing innovative and creative talent in Sri Lanka, to promote the optimal exploitation of the country's human and material resources, particularly labour and raw material resources by promoting the growth of suitable technology etc., are among the major objectives of establishing the NERD Centre. With the vision 'to be a Centre of Excellence in Engineering Research and Development in South Asia and to be able to make substantial contributions towards the sustainable economic and social development of the people of Sri Lanka through engineering inventions' and the mission 'to develop, acquire, adapt and transfer engineering technologies that would help in the production and sustainable utilization of human and material resources by engaging in R & D activities that would have a direct



Reed Bed with Canna

Increased population density, limited land availability, existing effluent discharging standards and increased water bills enabled us to think twice before

discharging of untreated domestic wastewater directly to the environment. The effluent generated from households can be divided into two fractions: the toilet wastes, commonly called black water, and other household wastewater, commonly called grey water. Grey water consists of effluent generated from the kitchen, dining, laundry and bathrooms. It is estimated that the daily per capita grey water from a

middle income resident is 150 litres. When in stagnation, untreated grey water would quickly turn septic and emit unpleasant odours due to the organic pollutants coming from kitchen sinks. Reed bed treatment systems or constructed wetlands are accepted worldwide as an appropriate solution for wastewater treatment. The potential for application of this technology in a tropical country such as Sri Lanka

are conducive for higher biological activity and productivity, causing better performance of wetland systems. Although land may be a limiting factor in dense urban areas, constructed wetlands are potentially well suited for semi-urban and rural areas.

Continued on Page 06

impact on the economic development of Sri Lanka and of the living standards of the people, the institution engages in engineering research projects in the fields of Civil Engineering, Agriculture and Post-Harvest Technology, Renewable Energy, Electrical and Electronic Engineering, and Energy and Environmental Management in achieving the aims of the above. Introduction of NERDC Cost Effective Housing Construction Technology consisting of several valuable cost effective techniques mainly pocket column foundation, slip form wall system & slab system, which save material, time and labour and also the introduction of more efficient and cost-effective new techniques to the various industries are the major activities of the Centre. Energy and environmental management services to the industry, manufacturing of dies and moulds and providing consultancy services in specialized fields, testing of CFL lamps, refrigerators and deep freezers and issuing test certificates for same, etc., are the other main services being provided by the NERD Centre. Eng. W.J.L.S. Fernando is the present Chairman of the NERD Centre.

### Main sections of NERD Centre

- Department of Renewable Energy (RED)
- Department of Environment & Energy Management
- Department of Civil Engineering
- Department of Design Fabrication & Consultancy to Industries
- Department of Electrical & Electronic Engineering
- Department of Agriculture & Post Harvest Technology
- Department of Techno Marketing (Technical Park & Engineering Museum)
- Department of Mechatronic Engineering
- Department of Finance and
- Department of Human

### Resources

#### Major tasks of the institution

- Engineering research and development projects
- Popularizing development technologies among people
- Technical transfer processes
- Building and establishing pilot projects

## NERD Centre (NERDC) Celebrates 42<sup>nd</sup> Year

those technologies or products. A nominal amount is charged as technical fees to provide such technology. Those who acquire such technology is provided with the necessary technical details and training. Department of Techno Marketing introducing technologies developed by the NERD Centre to relevant industrialists and suitable parties, activating various training programmes to propagate those in the country and facilitating the transfers of relevant technology to interested parties are handled by the Department of Techno Marketing. Technologies that can be transferred

- Manioc Slicer
- Palmira juice extractor
- Small Scale Pepper Thresher
- Wood gas stove
- Industrial Fire Wood Stove
- Bio-mass Rice Cooker
- Efficient biomass combustion system for tea industry
- Yoghurt incubator
- Vegetable

### construction technology

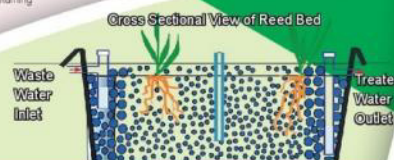
- Biogas generator
  - Tablet/pill counter
  - Coconut de-husking machine
  - Bakery oven
  - Cashew nut drying machine
  - Virgin Coconut Oil Extractor
  - Cost effective building construction technology
  - Precast concrete technology
  - Development of a Fertilizer applicator for coconut estates
  - Prestressed Concrete technology
- How to obtain a technology transfer  
If you are interested in obtaining a technology transfer, you have to name

- dehydrating machine
- Compressed Cement soil earth block making machine
- Crematorium

the technology you require and send a request with your name, address and telephone number to us. Then, our Center will send you an application relevant to the transfer of that technology. That application has to be duly completed and sent to us. Subsequently, after evaluating the relevant application, steps will be taken to transfer the technology. Enquire from the address given below to obtain applications.

Director, Department of Techno Marketing,  
NERD Center, Ekala, Ja-ela.  
Tel. - 011-2234266, 011-2236384

Eng. M.A.M. Fernando  
Director - Department of Techno Marketing  
NERD Center



## Constructed wetlands as a multifunctional solution for domestically generated grey water treatment

## Economizing on construction time and costs NERD Housing Technology

"The NERD Center is completely dedicated to conduct training courses on low cost building and house construction technology as well as imparting technical knowledge required by the general public"

At present, through the research conducted by the Department of Civil Engineering of the National Engineering Research and Development Center of Sri Lanka (NERD Center), several valuable technologies for the building construction field of Sri Lanka. These technologies are widely used at present to reduce costs and make construction processes easier.

In introducing these technologies by the Department of Civil Engineering of the NERD Center, they are transferred to entrepreneurs through technology transfer. Those entrepreneurs manufacture a vast range of products necessary for building construction through their precast and pre-stressed concrete yards and supply them to the market. Other than this, the tests necessary in building construction are conducted in the laboratory of that Department and it furnishes the necessary technical advice in construction. Here, the following construction requirements,

- Pre-stressed concrete columns
  - Pre-stressed concrete beams
  - Pre-stressed concrete struts
  - Pre-stressed concrete foot bridges
  - Pre-stressed concrete steps
  - Pre-stressed concrete pergolas
- can be introduced as products manufactured in the pre-stressed concrete yard. Pre-stressed concrete components are manufactured by pouring concrete into a shuttering prepared to suit the requirements and using bars subjected to tension. The components thus manufactured are kept for 45 days for the concrete to harden. The precast components required for building construction are,
- Concrete door frames
  - Concrete window frames
  - Concrete Spiral Steps
  - Concrete air vents
  - Precast Stringer Beams and Precast Steps

Methods and technologies have been introduced to get construction work done at low cost and better finish faster and here Cement stabilized earth blocks can also be used.

Furthermore, products manufactured by ferro-cement technology such as

- Ferro-cement rain covers
- Ferro-cement water tanks
- Ferro-cement toilets
- Ferro-cement foot bridges

are also of importance. Methods and technologies have been introduced to get construction work done at low cost and better finish faster and here Cement stabilized earth blocks can also be used. The NERD Center has also introduced Slip form wall technology of using cement and quarry dust as an alternative method for wall construction to the construction field. At present, more people are compelled to build multi-storey houses and buildings due to one of the main problems of building construction in Sri Lanka today, the site not being spacious enough, and aesthetic reasons, they are facing the problem of the slab being a main item of expenditure. To alleviate this condition, NERD Center has introduced the NERDC Composite Floor Slab System about 30 years ago.

As the concrete slab is low in weight, this system has the advantages of not requiring concrete beams and the costs for the foundation being less. Furthermore, as props are not required, the lower floor can be utilized in less time. As the underside of the concrete slab has a good finish, it does not require soffit plastering. Raw material requirements can be minimized as wood is used in minimum quantities or not at all, steel reinforcement bars are not used and the thickness of the concrete slab is lesser. Furthermore, time can be saved because no tying up with tie wire or making shuttering is necessary. Accordingly, when compared with a conventional concrete slab, this method has the ability of reducing costs by about 30%.

Here, the NERD Center has introduced two methods of constructing the concrete slab. One method is placing concrete beams of the required height at 2 feet intervals, placing plywood shuttering with an iron frame between the two beams, placing a galvanized 2 inches X 2 inches mesh over it and spreading a layer of 1:1½:3 concrete mixture of 2 inches thickness. In the other method, ferro-cement panels are used instead of plywood shuttering with iron frame. Panels of ferro-cement are placed between beams placed at two feet intervals; a galvanized 2 inches X 2 inches mesh is placed over it and a 2-inch layer of concrete using the pre-mentioned mixture. Normal beams of a trapezoidal cross section are used for the first method and panel beams with a shape allowing for the placing of panels are used in the second method.

Department of Civil Engineering  
NERD Center



# Destroying the Fruit Fly

# BASCA

In this fertile Land of Merit filled with tasty and nutritious fruit such as mangoes, wood-apple, guava... what actually do we eat today? Various poisonous chemicals and imported

fruit have overwhelmed the Sri Lankan fruit market. Finding a fruit suitable even for a small child is a problem.

There are so many causes and reasons. But, the fruit cultivator has to face the biggest challenge here. One of the major problems he has to face is saving his fruit cultivation from the ravages of the Fruit Fly. The Fruit Fly harms more than half of the fruit harvest. There is absolutely no way of protecting fruit from the ravages of the Fruit Fly through natural methods without resorting to chemicals. Before this massive challenge in the agricultural field, we have to remain without answers in our efforts to generate healthy and strong future generations. Herbal Technology Section Principal Research Scientist of the Industrial Technology Institute Dr. R.M. Dharmadasa has found an answer for this dilemma.

What is so special about this answer is that it has been created using the commonly seen 'Maduruthala' herb without resorting to chemicals that harm humans, animals and even the ecological balance. Here, 44 varieties of 'Maduruthala' (*Ocimum tenuiflorum*) has been identified in a research covering the whole 25 Districts of Sri Lanka and their chemical composition has been discovered through chemical analysis. Through

this research it was identified that not only the fragrance, colour and growth, but also the chemical composition of these varieties show a marked difference. Accordingly, the chemical compounds that attract the Fruit Fly was identified resulting in the identification of 12 varieties of 'Maduruthala' with the highest attraction to the Fruit Fly and out



**Dr. R.M. Dharmadasa**  
Research Scientist  
Industrial Technology Institute

of those four varieties of 'Maduruthala' with the optimum chemical composition have been used to produce this compound. Those four identified varieties of 'Maduruthala' were cultivated with the assistance of the Department of Agriculture in its areas of

cultivation. Accordingly, extensive research was carried out at the Makandura Research Center of the Department of Agriculture relevant to the Wet Zone and at the Mahailuppallama Research Center relevant to the Dry Zone. This research was conducted with financial assistance from the National Research Council and C.I.C. Company. The real victory that was achieved was that they were able to manufacture the products necessary to attract the Fruit Fly using natural ingredients such as natural plant extract and two varieties of naturally existing clay. This product, researched through six research institutions of the Department of Agriculture has been given the trade name of 'BASCA.' This product, produced through research from the month of September 2013 to the month of February 2016

was launched conjointly by the Industrial Technology Institute, the Department of Agriculture, the National Research Council and the C.I.C. Company at Waters Edge last January for the first time in the history and issued to the market. This product that can attract about 600-700 fruit flies per day, can be put into a small bottle with a hole wide enough for fruit flies to get in and hung on a tree in the fruit cultivation. Then the fruit flies will be easily attracted to it. This is a good solution to nurture the future generations through the unlimited goodness of more than 250 varieties of fruits of our country with the highest diversity of fruits in Asia whose natural fruit resource which is being destroyed through ravages of the Fruit Fly.

**W.A.S. Nisansala Kumari**  
Pictures - Niroshan Batepola



Continued from page 04-05

## Constructed wetlands...



Traditional Reed Plant Bed

All types of biodegradation processes namely aerobic, facultative and anaerobic are expected in wetlands and thus are applicable in grey water treatment. The role of wetland plants is to remove pollutants by directly absorbing them into their tissues and

to provide appropriate environments for micro-organisms to break down pollutants and reduce their concentrations, deterring flow and retaining suspended solids. They are also known to stimulate the soil activity by root excretions and reduce the volume of effluent by transpiration. All parts of a plant are involved in the wastewater treatment process. Besides filter media, plant roots provide surfaces on which bacteria attach and grow. Stems and leaves

act as natural aerators to funnel oxygen to the roots. Symbiosis ensures that reed plants absorb the metabolites produced by the bacterial degradation of the organic compounds while the microbes exploit the metabolites released from the plant roots. So, being a tropical country, where there is no considerable temperature fluctuation throughout the year, in Sri Lanka we can have relatively low residence time than those practiced in the temperate countries while achieving the higher pollution reduction efficiencies. According to research carried out in NERDC, it was found with 2.6 retention time, expected pollution reductions can be achieved.

Use of constructed wetlands for grey water treatment is a multifunctional solution as in addition to water quality improvement it provides numerous

other benefits. In addition to eliminating odour, the constructed wetlands will give an aesthetic and economic value to the home gardens by planting Lasia (Kohila), Water Spinach (Nivithi) and suchlike edible plant species and cannabis-like aesthetic species, instead of conventional reed plants such as common reed, narrow leaf cattail and bulrush. The other advantage is that there is no need of addition of water and fertilizers to the plants as they can take their nutritional requirements from the waste-water medium where they grow. Use of constructed wetlands for grey water treatment is a multifunctional solution as in addition to water quality improvement it provides numerous other benefits.

**Eng. N.P.T. Perera**  
National Engineering Research & Development Centre



# Are You Aware of the Quality of Food You Eat?

**F**ood, water, clothing and shelter are considered to be basic requirements of human beings. One of the 17 Sustainable Development Goals (SDGs) identified by the UNO in the 2030 Agenda for Sustainable Development, is "Zero hunger". The objective is to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture" by year 2030.

Although we all understand the need for food do we pay adequate attention to quality of food we eat?

The quality determines whether the food is acceptable to consumers. An average consumer may look into quality as freshness and other physical properties. But it is a lot more than that. Food quality consists of factors such as external appearance, texture, flavor and also internal factors such as ingredients, nutrients, chemical and microbial content etc.

As specified in SDGs proper nutrition is a basic requirement of human beings. Humans need many different nutrients to maintain their health and to be active. The nutrient requirements vary from person to person depending on their conditions such as pregnant and lactating mothers, infants, adolescents, adults and persons suffering with various health conditions.

Proper nutrition is essential to improve quality of life as well as socio-economic development of the country. Malnutrition affects productivity of individuals leading to less contribution from them to country's economic development.

When we refer to malnutrition we often think of the under-nourished who do not get adequate food or nutrition. But there is a double burden of malnutrition. Being overweight and obese is also considered as

a form of malnutrition. It is becoming a major issue as it leads to long term health conditions such as Diabetes and heart disease. Food quality is often associated with food safety, which ensures correct way of handling, preparation and storage of food to prevent

food-borne diseases. A high quality food means it is safe to consume without fearing adverse effects after consumption. It gives an indication that food is free of chemical and biological factors that are harmful to humans. Food quality can be affected during cultivation though application of agrochemicals such as pesticides, post harvest handling, processing and even during marketing.

Attention paid on food safety in our country is not sufficient to assure healthy and high-quality food for people. We see regular news on food –poisoning incidents among school children and employees in garment factories. Food contaminated with any chemical residues or pathogenic microbes lead to food borne diseases such as Diarrhea as well as long term health conditions such as cancers and kidney failures.

Food advertisements are largely responsible for changing consumer behavior that lead to incorrect choices. False information and misleading messages given in these advertisements make huge damage to the society, especially children. These advertisements are

to think "I have to eat this to be outstanding". Children who believe these advertisements influence their parents to buy these food items for them and sometimes it develops as a trend among young children.

The other major target group of food advertisements is mothers who are given messages such as "this milk powder will help developing your child's brain". Most of these advertisements claim to have high percentages of various nutrients; but whether there is any scientific evidence to prove it is uncertain. Even the information given in labels of other food items as to their ingredients may not have been scientifically verified.

Considering all these factors the National Research and Development Framework (NRDF) developed by the National Science and Technology Commission (NASTEC) has identified several issues related to food and nutrition in Sri Lanka. Some of them are; i) Lack of awareness on nutritional value of food, ii) Lack of methods to identify quality of food, iii) Unethical and misleading advertisements, iv) Absence of scientific investigation and data on chemical residuals in food, and v) Lack of proper surveillance programmes. The NRDF has also proposed Research and development needs and interventions to overcome these issues. They consist of: development of simple methods to assess the quality of food by identifying contaminants and toxins, development of methods to reduce toxicity in food crops, risk assessment of agro-chemical residuals in food and food additives and their impact on human health, assessment of risk factors for food-borne diseases, development of control measures for food borne disease including development of new vaccines to control livestock diseases. Development of accredited laboratories for testing of food products as well as adoption of strict quarantine procedures and development of quality standards would support providing high quality food to our people.

However, research itself will not ensure food safety and provision of proper nutrition. We need to create awareness among the general public on need for proper nutrition and nutrient content of food, food poisoning etc. Formulation

of proper regulations on food advertising will prevent misleading messages passed to people.

It is expected that implementation of these suggestions will support overcoming issues

relevant to food and nutrition in Sri Lanka.

**Asha Pitadeniya**  
Senior Scientist  
National Science and  
Technology Commission



## Advice

**R. Wijaludchumi**  
Secretary

Ministry of Science, Technology and Research

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# Ministry of Science, Technology and Research



## SCIENCE AND TECHNOLOGY FOR SOCIETY FORUM SRI LANKA 2016

7 September 2016 - Nelum Pokuna Theatre, Colombo  
8-10 September 2016 - Waters Edge, Battaramulla

### Main Tracks

- STI for SDGs
- Citizen Science
- Innovation Eco-system
- Emerging Technologies
- Nanotechnology

- STI imperatives for SDG's
- Big Data
- Community involvement in science and scientific research
- Informal Science Education for 21st Century
- STI skills development
- STI Infrastructure
- ICT
- Electronics and Robotics
- Novel Device Physics and Engineering
- Energy, Sustainability and Policy
- Science diplomacy
- Governance, planning and foresight
- Using Social Media for Discussing Science Topics
- Communicating STI
- Funding and Investment
- Intellectual Property
- Biotechnology
- Space Technology
- Nanomaterials



STS FORUM 2016

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