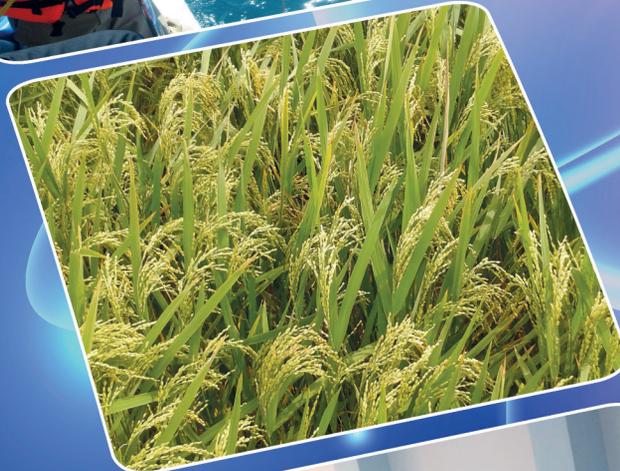


Building a Better Future in Sri Lanka: Contributions of Nuclear Science and Technology



SRI LANKA ATOMIC ENERGY BOARD



The Sri Lanka Atomic Energy Board (SLAEB) works to foster the role of nuclear science and technology in support of sustainable development of the nation. This involves both advancing knowledge and exploiting this knowledge to tackle pressing the challenges related to food, health, energy, environment and industry. The SLAEB works together with scientific institutes in the country and takes the leading role in promoting nuclear science and technology for the well-being of mankind.



Our Vision

Sustainable development of the nation through nuclear science and technology

Our Mission

Promote and encourage peaceful applications of nuclear technology and utilize its benefits for socio-economic development of the country while ensuring safety, security and quality

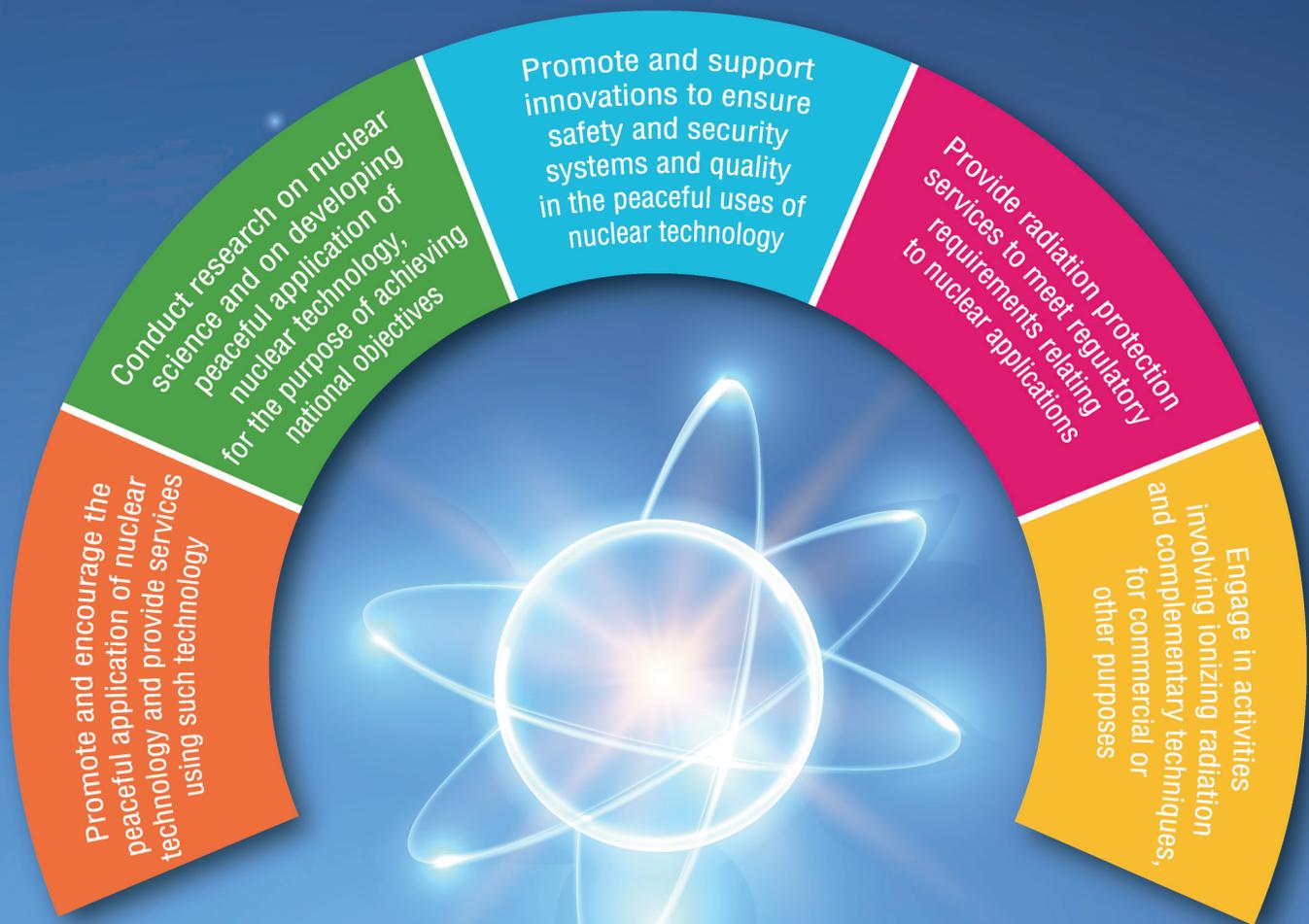
And,

Provide radiation protection services to facilitate protection of workers, public and environment from exposure to unwarranted ionizing radiation



OUR OBJECTIVES

As per the Sri Lanka Atomic Energy Act, No. 40 of 2014;



CONTRIBUTING TO THE ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT GOALS



Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations. These goals involve in tackling issues related to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The IAEA plays an active part in helping the international community to achieve the 17 SDGs. It helps countries to use nuclear and isotopic techniques and thereby contribute directly to attaining nine of the 17 Goals.

01. End hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2)
02. Ensure healthy lives and promote well-being for all at all ages (SDG 3)
03. Ensure availability and sustainable management of water and sanitation for all (SDG 6)
04. Ensure access to affordable, reliable, sustainable and modern energy for all (SDG 7)
05. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (SDG 9)
06. Take urgent action to combat climate change and its impacts (SDG 13)
07. Conserve and sustainably use the oceans, seas and marine resources for sustainable development (SDG 14)
08. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15)
09. Strengthen the means of implementation and revitalize the global partnership for sustainable development (SDG 17)

SLAEB together with its partner institutes contributes to achieve the SDGs in the country following the road map developed by IAEA.



Sri Lanka Gamma Centre (SLGC)

Gamma Irradiation is another important application of nuclear techniques in Sri Lanka. SLAEB provides irradiation services to wide spectrum of customers through Sri Lanka Gamma Centre (SLGC).

Sri Lanka Gamma Centre is the Multipurpose Cobalt 60 Gamma Irradiation facility belongs to SLAEB. It is in operation since 2014 January catering mainly the health care and food processing sectors of the country. It serves as the National Centre for the Gamma Irradiation Service as well as the research and development center for gamma radiation processing.

SLGC is accredited for Good Manufacturing Practice (GMP), ISO 9001 and ISO 13485 standards. Considering the high demand for the Gamma Irradiation from the industries, it upgraded the processing capacity in May 2017.

82 million pairs of latex surgical gloves to the Sri Lankan Government health care sector have been sterilized by SLGC since 2014. It enables Government of Sri Lanka to save billions of Sri Lankan rupees worth foreign exchange by cutting down surgical glove importation

In addition to that it paved the path for the development of single use surgical apron which is used in Sri Lankan hospitals at present. Many more health care products are in line for commercial production including hyper dermic syringes, gauze, urine collection bottles etc.

Benefits of Gamma Irradiation

- No recontamination
- Non-toxic
- Environmental friendly
- No chemical residues
- Reliable & safe
- Gamma irradiation produces no heat
- Treated product can be used immediately
- Proven use for 50 + years
- Complete product penetration
- Very precise and reproducible



National Centre for Non-Destructive Testing (NCNDT)

The National Centre for Non-Destructive Testing (NCNDT) of Sri Lanka Atomic Energy Board carries out a wide range of Non-Destructive Testing (NDT) services. The prime objective of this centre is to provide training, certification and inspection services on NDT and related techniques as per international standards.

Training Activities

Successful and consistent application of NDT techniques depends heavily on personnel training, experience and integrity. Personnel involved in application of industrial NDT methods and interpretation of results should be certified.

The main professional NDT qualification training courses include all conventional NDT methods following ISO 9712 certification scheme. IAEA fellowship trainings are being hosted by NCNDT since 2016.

Certification Activities

The SLAEB has established a National Certification Body for NDT-Sri Lanka (CBNDT) for qualification and certification of NDT personnel in conforming to the requirements of ISO 9712, “Non-destructive testing –

Qualification and certification of NDT personnel” and ISO/IEC 17024, “Conformity assessment – General requirements for bodies operating certification of persons”. The CBNDT is facilitated by NCNDT and it has been accredited by Sri Lanka Accreditation Board. Further, it is registered under the ICNDT Multilateral Recognition Agreement for Personnel Certification Bodies. NDT training, qualification and certification process is now proceeding as per the guidelines of CBNDT.

Inspection Services

NCNDT has provided NDT inspection services to industries of Government and private sector for last three decades. The inspection body of NCNDT received accreditation as per ISO 17020 for four NDT methods including Magnetic Particle Testing, Liquid Penetrant Testing, Ultrasonic Testing and Concrete Testing. NCNDT has well equipped laboratories as per the internationally accepted standards providing Non-Destructive, Semi-Destructive and Destructive Testing services along with related Mechanical and Chemical Testing.



Meeting the Challenges in Food and Agriculture

Nuclear technologies provide innovative solutions to improve agricultural practices while ensuring environmental sustainability and food safety. Nuclear applications in agriculture rely on the use of isotopes and radiation techniques to combat pests and diseases, increase crop production, protect land and water resources, ensure food safety and authenticity, and increase livestock production. SLAEB has succeeded in harnessing the applications of nuclear technology to develop agricultural productivity and sustainability.

occurring polymer; chitin which is extracted from the exoskeleton of the crustaceans such as prawns, crabs, shrimps etc. Chitopower has a potential to use as a plant growth promoter and its antimicrobial property has been tested against wide range of microorganisms. This product has won the first place under the open category in the technical field of environment at “Sahasak nimevum-2014 (සහසක් නිමැවුම්)” national invention exhibition organized by Inventors Commission of Sri Lanka. This product has further been modified to iodo-chitosan complex to enhance its antimicrobial properties.



Super Water Absorbent (SWA) polymers can absorb and retain large amounts of water and release slowly to the crop. SLAEB has developed a SWA with cassava starch using radiation induced polymer grafting techniques. The field trials for developed SWA product have been successfully completed with the assistance of Department of Agriculture. This product can be used to increase water use efficiency in agricultural lands by retaining water in the soil, especially in the dry zone and sandy areas of the country.

Efficient farming methods should be environment friendly and provide satisfactory return on yield. Chitopower is one of the agricultural products developed by SLAEB in collaboration with Department of Agriculture using radiation processed naturally

The commercialization process for above two products is in progress.



Fallout RadioNuclides technique (FRNs) refers measuring radio nuclides attached to the soil which came to the earth as fallout. This radio nuclides can be used as a marker to compare status of soil erosion in the natural landscape. Compound Specific Stable Isotopes (CSSI) are naturally occurring soil organic biomarkers that can also be used to identify sources of sediments and hotspots of land degradation. SLAEB together with Natural Recourse Management Centre (NRMCC) of Department of Agriculture conducted studies in the landscapes of the central highlands using these techniques. Researchers were able to undertake appropriate conservation measures by working together with farmers, industry and local community to seek solution.



Mutations have been shown as a way of creating variations in plants and they occur spontaneously in nature. Ionization radiation can induce mutations within plant own genetic makeup mimicking the natural process of spontaneous mutation. Hence radiation induced mutation breeding is used to create valuable agronomic traits and speed up plant breeding programmes. Researchers of the Department of Agriculture were able to develop several varieties

using this technique including bacterial wilt resistant tomato “Lanka Cherry”, High yielding ground nut variety “Thissa”, Drought resistance Rice variety “BW372”, Late Blight resistant sesame variety “Malli” etc. Gamma Chamber 1200 was installed at Horticultural Research and Development Institute of the Department of Agriculture in November 2017 with the technical cooperation of IAEA. It will be benefitted for creating mutant germplasm for crop improvements in the country. The irradiation service is provided by the Department of Agriculture free of charges for the researchers.

Heavy use of agrochemicals and pharmaceutical products at farm level poses serious public health risks and has negative impact on national economy. The Food Safety and Quality Assurance Laboratory (FSQAL) of the Department of Veterinary Public Health and Pharmacology of the Faculty of Veterinary Medicine and Animal Sciences, University of Peradeniya was established in early 2000 with



the financial and technical support received from IAEA. The FSQAL provides services to screen animal originated food and animal feed for various veterinary drug residues and related chemical contaminants by using nuclear and complementary techniques. It is the first laboratory in the Sri Lankan university system to obtain ISO 17025 accreditation. FSQAL received the first place in livestock and fisheries sector of the National Awards for Excellence in Agricultural Research 2017 organized by the Sri Lanka Council for Agricultural Research Policy (SLCARP) of the Ministry of Agriculture in recognition of the research conducted on “Establishment of Methods to Ensure Chemical and Microbial Safety of Food of Animal Origin.” At present collaborative work is being conducted on safety of animal originated food by the FSQAL and the Food and Agriculture Section of the SLAEB.





Improving Human Health

Human Tissue Bank

Human Tissue Bank (HTB) serves to the mankind by providing tissues to the needy patients anywhere in the world irrespective of their color, race, religion etc.

HTB obtains tissues from dead bodies and prepare them according to the International standards for the purpose of grafting. Co-60 Gamma radiation is used for sterilization. The sterilized tissues are safely stored and issued to hospitals which need them.

The HTB is a model project of the IAEA implemented in Sri Lanka which is a joint effort of Eye Donation Society, Atomic Energy Authority and Ministry of Health. It deals with all donor tissues including all kinds of bones, fascialata, eye sclera, amniotic membrane and skin. This model human tissue bank was set up by the late Dr. Hudson Silva in May 1996.

Contact Details-

Sri Lanka Human Tissue Bank

120/11, Vidya Mawatha,

Colombo 7, Sri Lanka.

Phone & Fax : 0094 11 2696109

E-mail : tissuebank@dialogsl.net

Web: www.eyedonation.slt.lk

Bio-dosimetry - A Blood Test to Predict Human Exposure to Radiation

Biological dosimetry is recognized as a valuable tool to assess human exposure to radiation. It accurately assesses both accidental and occupational exposure to radiation as well as total and partial body exposure to radiation. Bio-dosimetry is based on assessment of chromosome damages in blood lymphocytes as a biomarker of radiation. As lymphocytes traverse in the blood over the entire body, it provides accurate estimation of dose rates on individuals exposed to partial as well as whole body radiation. The technology was introduced to Sri Lanka in 2010 through IAEA and is currently available only at the Faculty of Medicine, University of Kelaniya. SLAEB has launched a mission to pave the way together with IAEA and University of Kelaniya to monitor radiation workers using this technique.



Nuclear Medicine Unit (NMU), Peradeniya



The Nuclear Medicine Unit (NMU) of Faculty of Medicine, University of Peradeniya was the first Nuclear Medicine facility established in Sri Lanka to provide services for early detection of cancer and therapeutic purposes. It was opened in 1973 and has been supported for over forty years by IAEA. Nuclear medicine imaging uses small amounts of radioactive materials called radiotracers that are typically introduced to the body by injecting, inhaling or swallowing. The radiotracer travels through the area being examined and gives off energy in the form of gamma rays which are detected by a gamma camera. The created images of the inside of the body provide information on function of any organ in the body; especially many types of cancers at early stages.

Recently, the NMU has undergone a major upgrade to bring its technical and safety standards to align with modern nuclear medicine facilities in the world with the assistance of IAEA. This unit has also played a significant role in undergraduate as well as postgraduate medical education. Currently, the NMU provides clinical services to perform around 3000 scans and treats over 200 patients for thyroid cancer per year. In addition, the NMU carries out over 30,000 blood tests per year using the radioimmunoassay technique.

Molecular Medicine Unit, Faculty of Medicine, University of Kelaniya, Ragama

National Centre for Research, Training and Services in Medical and Molecular Entomology for vector-borne diseases control

The main role of the centre is conducting research on development, testing and deploying innovative disease prevention techniques including autocidal gravid ovitrap, repellent and mechanical barriers with slow releasing properties of the insecticide using nanotechnology and dengue vector mosquito with blocking dengue viral replication inside vectors using RNA interference technique. One of the major activities where the IAEA and use of radiation is involved is the application of classical Sterile Insect Technique (SIT) and Incompatible Insect Technique (IIT) for controlling dengue vector mosquitoes. Another important area for research is development of diagnostic kits for vector-borne diseases. The knowledge gained by studying and conducting research will develop capacity in control and elimination of vector-borne diseases in the future.

The project has made an excellent progress so far in meeting the objectives and end users will be the scientific community and the health personnel by gaining knowledge on medical and molecular entomology through conducting research and training. Therefore, general public who live in endemic/epidemic areas of vector-borne diseases will be finally benefited.





Proposed Medical Cyclotron Facility

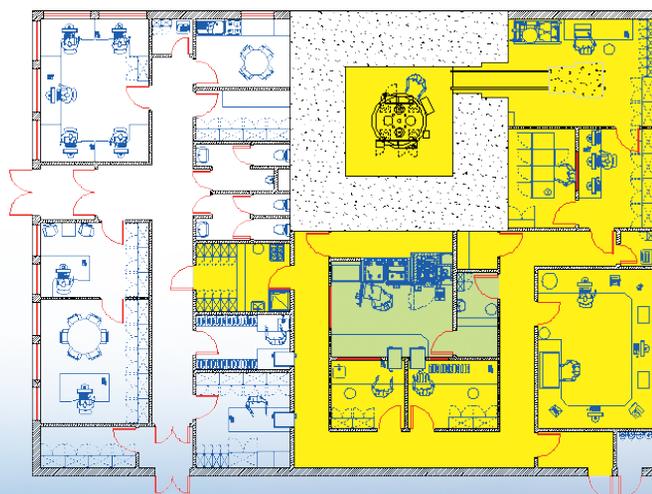
Radiopharmaceutical Production in Sri Lanka for Health-Care Services

A cyclotron is a machine used to make relatively short-lived radioisotopes that can be used for medical imaging and research. It is mainly used for the production of radioisotopes essential for Positron Emission Tomography and Computed Tomography (PET/CT) scanning, which is the key in early diagnosis of several diseases including cancer and cardiovascular diseases.

Currently in Sri Lanka there is only one PET/CT scanner in operation at a private hospital and it totally depends on the radiopharmaceutical 18-F Fluorodeoxyglucose (18F-FDG) air delivered from India. The radiopharmaceutical 18F-FDG cannot be imported in advance and stored as it is a very short half-lived radioisotope of 110 minutes. Further, during the delivery time of 5-6 hours from its production center in India to the point at which it is used in Colombo, the useful strength (radioactivity) of 18F-FDG is decayed by about 85%. As a consequence, the cost of a single PET/CT scanning in Sri Lanka has become over Rs. 150,000/= limiting the accessibility for this important diagnosis to the majority of needy patients in Sri Lanka.

As such SLAEB is proposing to establish “Medical Cyclotron facility for Radiopharmaceutical Production” in Sri Lanka.

SLAEB has already been able to obtain three expert missions through IAEA technical assistance programme to assist local counterparts in planning the Cyclotron project. The mission’s findings are used to further develop the proposal seeking funding agencies to share the cost of establishing such an expensive as well as technically advanced facility in Sri Lanka.



Layout of Proposed Medical Cyclotron Facility

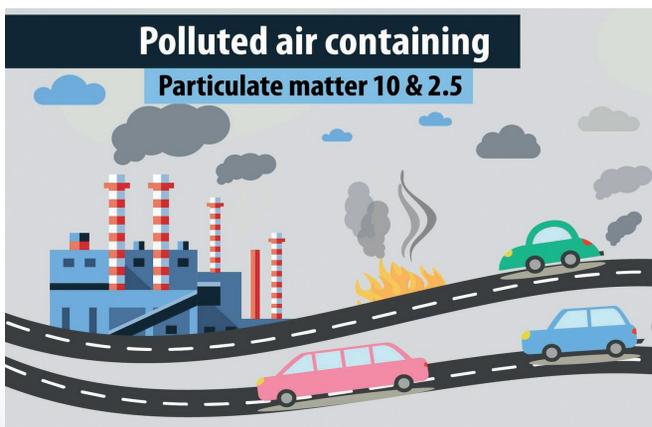


Protecting Environment and Water Resources

SLAEB participates in air pollution monitoring programmes from year 2000 in collaboration with the end-user institutions such as Central Environmental Authority, Department of Meteorology and Department of National Museums. The study on air particulate matter pollution monitoring in Colombo metropolitan and nearby suburb, Orugodawatta area were continued until 2012 under this program. The key findings have been used by Central Environmental Authority, to formulate and upgrade the ambient air quality standard levels in the country.

Kandy. Using nuclear techniques, researchers were able to identify the source and level of air pollution in Kandy city. The findings of the study will be utilized for the identification of long-term trends of pollution, contribution of major pollutant sources and long-term transport pathways of specific sources. Further it will be helpful to relevant Authorities to implement air quality management strategies.

In Sri Lanka, coastal and estuarine pollution has been identified as one of the potential threats to human health and economic stability of its inhabitants.



The sacred city of Kandy is declared as a world heritage city by the UNICEP and recent studies revealed that the city has topped the list in air pollution in the whole country. It is essential to have continuous data set to come to a conclusion of the status of air quality in

Marine Environment Protection Authority (MEPA) has a mandate to take necessary action for prevention reduction and control of marine pollution in Sri Lankan waters. SLAEB and MEPA has launched an environmental pollution monitoring programme

in Negombo lagoon as a case study to assess the existing levels of pollution and to investigate the historical evolution of pollution through applications of nuclear and isotopic techniques. These techniques



provide a unique source of information on the origin of contaminants and are used to trace their pathways in the environment.

Isotope techniques are applied frequently to investigate the groundwater dynamics, origin and contaminants in the dry zone and coastal areas having issues on groundwater quality as well as groundwater potential. Isotope hydrology program of the SLAEB focused in two main directions; water

management aspects and dam/reservoir safety studies during last 10-12 years in collaboration with water authorities and dam owners in the country.

One of the key achievements under dam safety program is identification of the origin of water leakage in Samanalawewa reservoir using stable isotope and radio-tracer methods. Many other techniques applied by the local and foreign experts for two decades had failed to trace out the leakage of the Samanalawewa reservoir. Also the leakage of headrace tunnel of Uma Oya Multipurpose Development Project was investigated and a report was submitted with the information on groundwater dynamics in the areas affected (dried out) by the tunnel leakage for future remedial actions.

The causative factors for water quality deterioration in the North-Western and Northern coastal aquifers have been identified using isotope techniques and this information is very much beneficial for the water authorities to plan their future water supply projects. Isotope hydrology programme has also been focused in to identify nutrient pollutants in surface water bodies which are subjected to eutrophication.





Technical Support for Radiation Safety and Security

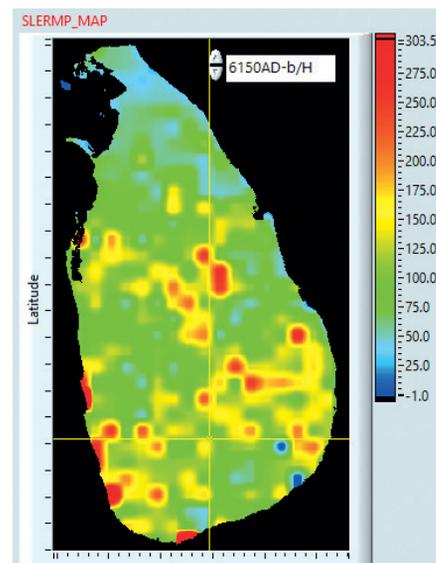
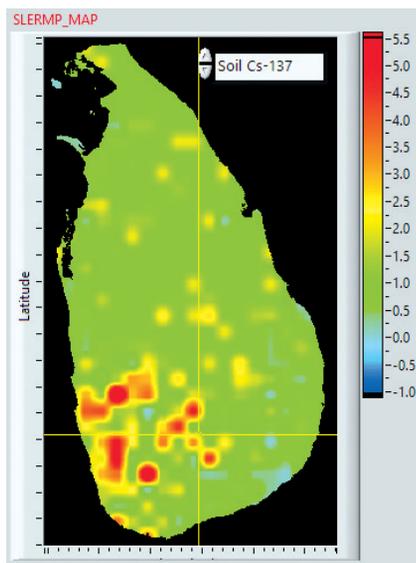
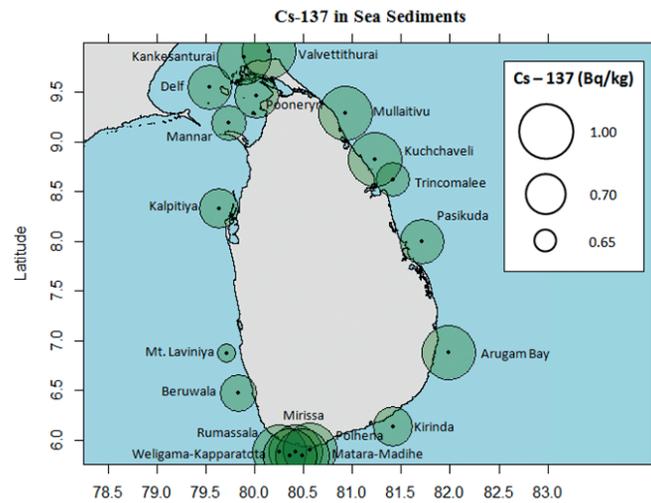
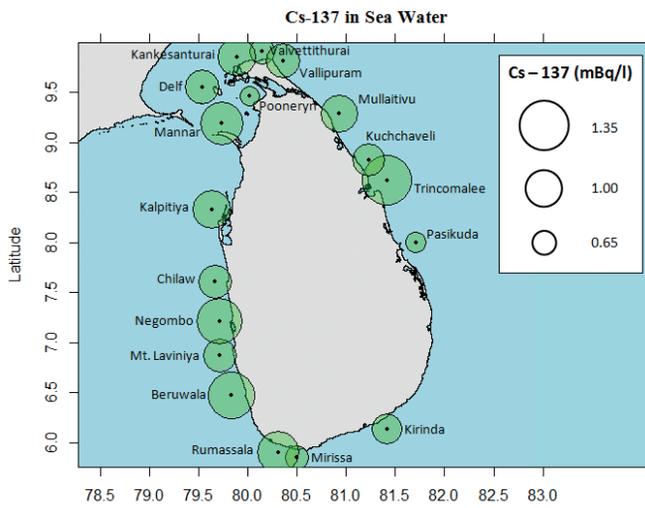
Baseline Radiation Levels and Emergency Response

Over the last decades, nuclear industry has been developed by the multiple applications in different areas and nuclear power has become an important energy source in many countries. Despite the safety performance of the nuclear industry, incidents and accidents may occur with or without significant impact on the environment and on public health. In Sri Lanka, although there are no nuclear power plants at present, the country could be influenced by the releases caused from nuclear facilities existing in neighboring countries. To ensure that our environment and people is not adversely affected by unwarranted exposure to ionizing radiation as the responsible agency, SLAEB has taken steps for preparedness and response to radiological and nuclear emergency. As a result of the national project on "Developing National Capability to Respond Radiological Emergencies in Sri Lanka" was launched successfully to achieve the following objectives

- a. Improve the environmental radiation monitoring capability of SLAEB and make available of Baseline data on environmental radioactivity

- b. Establish an online radiation monitoring system for early detection of nuclear emergencies in neighboring countries as an Early Warning System
- c. Develop and implement a National Radiological Emergency Response Plan
- d. Personnel training on emergency response

Information on Background Radiation is very useful in analyzing the effect of increase in radiation levels after an event of nuclear emergencies. The baseline levels of radioactivity data are essential in case of any possible contamination in the future to verify the radiological accident. Therefore, SLAEB is engaging on the preparation of "base-line data" doing In-situ measurements and environmental sampling island wide as well as in the marine environment. The total land area of the country is divided into four hundred (400) squares and in-situ and laboratory radiation measurements for soil and grass were taken. Marine radioactivity database for Sri Lanka was established in collaboration with Marine Environment Protection Authority (MEPA). Existing levels of natural and artificial radioactivity concentrations of K-40, Ra-226, Th-232, Cs-137 and Cs-134 in marine and coastal sediment collected from selected locations in Sri Lanka were determined.



Sri Lanka Atomic Energy Board has established an on-line radiation monitoring system which works as a Nuclear Disaster Early Warning System. The system monitors environmental radiation levels continuously at different locations around the country. Currently eight numbers of Remote Monitoring Stations (RMS) were installed at Colombo, Puttalam, Mannar, Delft, Kankasanturai, Trincomalee, Galle and Kandy. The Central Monitoring Station (CMS) of the above system was installed at the SLAEB premises.

Sri Lanka Atomic Energy Regulatory Council is developing the National Radiological Emergency Response Plan and SLAEB assist them to implement the plan. Officers from Sri Lanka Army, Sri Lanka Navy and Sri Lanka Air Force, Medical Officers, selected university staff, officers from President's Security Division and Ministerial Security Division were trained for emergency response and this training is being continuous. IAEA experts contributed as resource persons in some of these training programmes.

Nuclear Security

Nuclear security of Sri Lanka covers the physical protection of nuclear facilities and materials, security of non-nuclear radioactive sources and import-export controls at national borders and so on. SLAEB provides expert assistance to train Front-Line officers (FLOs) and involves in activities related to strengthening our detection capabilities, methodologies and specific programmes in order to ensure nuclear security in the country.



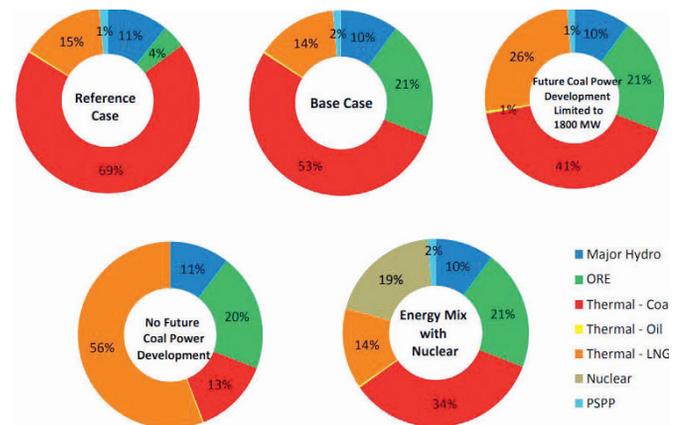
Nuclear Power Planning Programme in Sri Lanka

Energy is the engine of development and prosperity. Sri Lanka being a country without indigenous energy sources other than hydropower and non conventional renewables, has limited options to meet the expected growth in the demand for electrical energy. In that context, Sri Lanka consider nuclear power as a possible candidate to future energy mix.

Nuclear Power plants produce virtually no greenhouse gas emissions or air pollutants during their operation and have only very low emission levels during their entire life cycle.

Pre-feasibility study on the use of Nuclear Power for the generation of Electricity has been considered since 2010. By the Ministry of Power & Renewable Energy (MOPRE) with involvement of Sri Lanka Atomic Energy Board (SLAEB), Ceylon Electricity Board (CEB), Sri Lanka Atomic Energy Regulatory Council (SLAERC) and Public Utility Commission (PUCSL)

CEB, in their "Electricity Generation and Expansion Plan 2018 — 2037" has identified the following five scenarios.



Energy share comparison in 2037

In view of the above, it is required to carry out as in-depth study on the development of a nuclear power plant in Sri Lanka and focusing attention on the possible sites would be of great concern in this respect. It will support the gradual shift towards easy implementation, if a policy decision on utilizing nuclear power is taken in future.



International Cooperation

International Cooperation Division of SLAEB functions as the National Liaison Office to the Division of Technical Cooperation (TC) of International Atomic Energy Agency (IAEA). Through the IAEA's Technical Cooperation (TC) Programme, the division assists the sustainable socio-economic development of the country in the field of peaceful use of Nuclear Science and Technology. TC programme provides its technical support for Member States (MS) through TC projects such as National Projects, Regional Projects [Projects under Regional Cooperative Agreement (RCA) and Non-RCA], Inter-Regional Projects and Coordinated Research Projects (CRP).

TC programme provides significant contribution for the development of human health, industry, agriculture, environment and energy sectors of the country by supporting to develop human resources mainly policy makers, scientists, engineers, technologists and other relevant officers through granting opportunities to participate IAEA organized and sponsored meetings, trainings, workshops, scientific visits and fellowship trainings. TC programme donates necessary scientific equipment ranging from simple to high-tech in order to assist productive implementation of the project activities in the country. Under the category of CRP, IAEA

provides financial assistance to conduct R & D activities to address the national problems.

As per the in-kind contribution to the IAEA, Government of Sri Lanka annually hosts some IAEA coordinated activities such as international meetings, trainings, workshops, scientific visits and fellowships. International cooperation division functions as the local organizing unit for such events by providing administrative and logistic support.

The division also coordinates with Republic of Korea (KOICA, RCARO and KIRAMS), Japan (MEXT, NIRS) and Italy (ICTP) to obtain technical assistance for the country to the development and enhancement of the field of Nuclear Science & Technology. Apart from that, the division works for development of bi-lateral cooperation between IAEA MS in the peaceful use of Nuclear Technology Applications.



IAEA

International Atomic Energy Agency

Atoms for Peace and Development



Nuclear Knowledge Dissemination

Programme of Introducing Nuclear Science & Technology for Schools

Today, nuclear touches almost every aspect of our day-to-day life; health care, food production, and preservation, innovative ways to enhance safety and efficiency of industrial processes, better management of natural resources and agriculture which are remained unknown to many in our societies. Therefore, it has become a growing need to address the misconceptions of public perception related to Nuclear Science & Technology (NST) through transparent, balanced, and focused educational activities. As well as support and mentor young students to be aspiring scientists and other professionals in the field is essential in order to develop NST in Sri Lanka.

Best approach to nature young minds by injecting concepts of NST in Sri Lanka is well established school education platform. Sri Lanka Atomic Energy Board in collaboration with the Science Branch of Ministry of Education launched the programme of introducing NST for school students in 2016, in line with the IAEA regional project RAS0065.

This programme is leading to raise awareness and increase understanding of NST among school students and teachers by combining unique teaching

strategies and materials with the help of existing education system and school curriculum. In future, this programme will help to increase number of young people who take up studies in the nuclear field and then positively contribute to the country's development as well as well aware general public on NST.

Further SLAEB disseminates knowledge on peaceful uses of nuclear science and technology among professionals, academics, undergraduates and the general public through awareness programs and national level exhibitions.

Library of SLAEB

The library of the SLAEB is a collection of information sources which enables the scientific & technical staff and other interested parties to quench their thirst on NST. This is the largest and most sophisticated collection of books, periodicals, newspapers, manuscripts and other multimedia sources on NST available in Sri Lanka.

The SLAEB library also publishes the bi-annual magazine "Nyashtika Sandesa" (The Nuclear Message) which is the only scientific & educational publication in the country on NST. The SLAEB is the focal point of International Nuclear Information Science (INIS) maintained by IAEA.



Our Services

Nuclear Analytical Services

- Measuring the radioactivity of import and export food items (milk powder, canned fish, tea and etc.) in compliance with ISO IEC 17025 from National Accreditation Board
- Measuring radioactivity in soil, vegetation and water
- Measuring metal concentrations in alloys, archaeological artifacts and unknown objects (meteors) using XRF and TXRF technologies
- Measuring gross alpha, beta in samples
- Identifying recharge mechanism and dating of groundwater using isotopic techniques
- Testing water quality parameters



Radiation Protection and Technical Services

- Providing island-wide calibration services for radiation measurement and diagnostic radiology machines by maintaining Secondary Standard Gamma Beam and medical standard gamma beam
- Providing island-wide Personal Monitoring Services using Thermoluminescence Dosimeters (TLD)
- Repairing and maintenance of radiation measuring and detection instruments



- Developing technical and physical capabilities to nuclear waste management and maintain spent radiation sources storage
- Measuring radiation levels and demarcating control areas in industrial workplaces (e.g: mineral processing facilities)
- Providing expert assistance in radiation and nuclear incidents in Sri Lanka
- Providing technical supports for National Nuclear Security Regime such as developing the SOPs, Personnel Trainings & Instrumentation

- Providing technical assistance for radiation facility designing, conducting researches on radiation protection and Training of Radiation Protection Officers (RPOs)

Non-Destructive Testing Services

- Qualification and certification of NDT personnel in conforming to the requirements of ISO 9712 and ISO/IEC 17024 for 06 NDT methods [Radiographic Testing (RT), Ultrasonic Testing (UT), Eddy Current Testing (ET), Magnetic Particle Testing (MT), Liquid Penetrant Testing (PT) and Visual Testing (VT)]
- Providing NDT inspection services for power plants, boilers, aircrafts, ships, bridges and concrete structures [The Inspection Body of NCNDT has been accredited as per ISO/IEC 17020 for 04 NDT methods (MT, PT, UT and Concrete Testing)]



Gamma Irradiation Services

- Sterilisation of disposable medical products (gloves, aprons, syringes, gauze etc) in compliance with ISO 13485
- Sterilisation of packing materials
- Quarantine treatment of agro products and wooden objects, coir and coir based products
- Pasteurization of frozen/fresh and dried seafood
- Provision of R & D services with Gamma Irradiation Technology



Our Important R&D Activities

- Developing the detection capabilities of Radiation Portal Monitors (RPMs) installed at the borders and sea port to prevent the illicit trafficking of nuclear materials. A new mobile application (TRACE) was launched by the IAEA to identify real alarms without compromising with innocent alarms coming from NORM
- Designing and development of novel nuclear instruments
- Advancing radiation detection instruments for detecting nuclear and other radioactive material out of regulatory control
- RADI-Count is an educational purpose nuclear instrument that can be used for nuclear physics experiments in undergraduate and advance level physics syllabus
- Investigating groundwater dynamics in the dry zone of Sri Lanka; mainly in the endemic zones of Chronic Kidney Disease with unknown etiology (CKDu) to find any links between groundwater dynamics and CKDu
- Studies on seawater intrusion and quality deterioration of groundwater in coastal zones using isotope and chemical methods
- Submarine groundwater discharge studies using radon method
- Investigations on river and lake water pollution by nutrients using nitrogen isotopes
- Leakage/seepage investigations of dams and reservoirs
- Developing methods for water quality tests as an analytical service
- Investigations on the origin and the existence of thermal springs in Sri Lanka
- Verification of origin of cattle milk produce in different agro-climatic zones of Sri Lanka to enhance food safety using isotopic and related techniques
- Assessing the authenticity, safety and quality of locally produced and imported milk powder using nuclear related complementary techniques
- Assessing soil erosion, water pollution and land productivity status of major agro-ecological regions of Sri Lanka as an effort to sustainable land management in degraded lands to ensure food security
- Developing methodologies to protect cultural heritage artefacts using radiation surface modification techniques to protect them from microbes, moisture, temperature and other environmental conditions.
- Developing radiation grafted chemical/ oil absorbent for water treatment
- Studying radiolytic degradation of selected pharmaceutical contaminants in water
- Radioanalytical and isotopic studies of climate trends and variability in Marine Paleo-records in Sri Lanka
- Assessment of temporal trends of pollution of marine ecosystems in Colombo and adjacent coastal belt in Sri Lanka
- Assessing the impact of urban air particulate matter on air quality in Kandy city and industrial areas
- Chronic Kidney Disease (unknown) study (continued the study to measure effects of radioactivity and heavy elements in sediments of lakes/reservoirs in selected areas)

Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less.

- Marie Curie -





SRI LANKA ATOMIC ENERGY BOARD

E-mail : officialmail@ae.gov.lk

Web : www.aeb.gov.lk



**National Centre for Non-Destructive Testing
Sri Lanka Atomic Energy Board**

977/18,

Bulugaha Junction,

Kandy Road, Kelaniya.

Tel: 011 2987854/55/56

Fax: 011 2987851



Sri Lanka Gamma Center

Biyagama Export Processing Zone,

Block A, Walgama, Malwana.

Tel: 011 2487757/2487759

Fax: 011 2487759