



# **RESEARCH AND GRANT BULLETIN - 2022 UNIVERSITY OF PERADENIYA**

This bulletin carries grants that are active at least for a part of 2022



# Multidisciplinary Research Grant Scheme

The University Research Council, the research arm of the University of Peradeniya initiated a scheme to provide multidisciplinary research grants in 2022. The objective of this grant scheme is to foster collaborative research among nine faculties covering the disciplines of Medicine, Agriculture, Arts, Science, Engineering, Dental Sciences, Veterinary Medicine and Animal Science, Management and Allied Health Science, and four postgraduate institutes. The following grants are currently supported through this scheme.

- Predicting the incidence of subclinical mastitis in dairy cows using machine learning techniques
- Applications of White Light Images and Artificial Intelligence for the Early Detection of Oral Cancer in Sri Lanka
- Internet of Things (IoT) for Smart Agriculture: Assessment of a low-cost low-power IoT system using agronomic parameters, image analysis, and machine learning
- Design and Implementation of Microenvironment Conditions for Tea and Ornamental Foliage Plants using Precision Agriculture Systems Powered by Solar Photovoltaics
- A Wearable Device for Real-Time Monitoring of Biometric Signals of Pregnant Women, Athletes, and Other Persons
- Radiation shielding for medical procedures: synthesis of cost-effective, lead-free material
- Microbial control of mosquitoes: Microbes as Bio-larvicides and Fitness indicators of Dengue Vector Mosquitoes
- Impacts of land-use changes and soil erosion on water quality and aquatic macroinvertebrate community responses in a small mountainous catchment in Mahaweli River Basin
- Development of a rapid molecular tool for the detection and accurate identification of quarantine weeds
- Prevalence of Metabolic syndrome and its components among university students at the University of Peradeniya, Sri Lanka
- Morphological, biochemical, and molecular characterization of nutmeg (*Myristica fragrans* Houtt.) germplasm in Sri Lanka
- Identification and quantification of chemical and microbial contaminations in the watershed of Mahaweli river to ensure a safe drinking water supply

# Foreign Research Grants

- **Grant Title:** Tuning optical and electronic properties via molecular engineering of photon upconverting nanocrystal core and IR emitting electronically conducting donor-acceptor type polymer shell architectures.  
**Funding body:** Asian Office of Aerospace Research and Development
- **Grant Title:** An integrated, fast-track platform for rice breeding for drought and salinity stress tolerance targeting production environments in Sri Lanka  
**Funding body:** The United Nations Educational, Scientific and cultural organization
- **Grant Title:** Greenhouse Gas Emissions from Paddy Ecosystems critical Windows of Water and Gas Diffusivity  
**Funding body:** Asia Pacific Network Project  
**Website:** <https://www.apn-gcr.org/project/greenhouse-gas-emissions-from-paddy-ecosystems-grepec-critical-windows-of-water-and-gas-diffusivity/>  
**About:** This project forms a regional research initiative to distinguish the critical water and gas diffusivity windows for paddy soils and understand the impact of soil and environmental factors and water management strategies. The study will propose the best management practices the region can adopt to avoid critical windows and minimize GHG emissions.
- **Grant Title:** Research on the spread of steel girder bridges in Sri Lanka  
**Funding body:** JFE Steel Corporation - Japan
- **Grant Title:** Compound flooding from tropical cyclone-induced sea surge and precipitation in Sri Lanka  
**Funding body:** Natural Environment Research Council - UK  
**Website:** <https://gtr.ukri.org/projects?ref=NE%2FS005838%2F1>  
**About:** Project aims to produce a new generation of compound flood hazard maps, based upon state-of-the-art computer modeling. It will also consider a variety of climate change scenarios which will influence flooding due to predicted rising sea levels.
- **Grant Title:** Scalable Bio-based solution for the elimination of Cyanotoxins in Drinking Water  
**Funding body:** Biotechnology & Biological Sciences Research Council - UK

- **Grant Title:** Artificial Intelligence framework for threat assessment and containment for Covid-19 and future epidemics while mitigating the socioeconomic impact on women, children and underprivileged groups

**Funding body:** International Development Research Centre – Canada

**Website:** <https://covid.eng.pdn.ac.lk>

**About:** Based on generated behavior and movements, this project will develop AI to conduct contact tracing and socioeconomic impact mitigation actions in a more informed, socially conscious, and responsible manner in the case of the next wave of COVID-19 infections or different future infectious diseases. The project will develop a set of recommendations for the policymakers and medical practitioners can access.
- **Grant Title:** Trans-national cohorts of nephrotic syndrome - a unified approach to a chronic disease

**Funding body:** Nephros International Project UK
- **Grant Title:** One Health Poultry Hub

**Funding body:** Research & Innovation - UK

**Website:** <https://www.facebook.com/PoultryHubSL>

**About:** The main objective of this project is promoting the sustainable global intensification of chicken meat and egg production and distribution networks in each partner country with the aims of improving technology and human resources for the sustainable development of the industry.
- **Grant Title:** Internet of things for smart agriculture: Assessment of agronomic traits and related gene expression of tomato grown under field, semi-controlled and controlled environmental conditions employed with low, energy IoT solutions

**Funding body:** Organization for women in science for developing countries
- **Grant Title:** Building climate Resilience in farming systems in stoping lands of South Asia

**Funding body:** APN Japan

**Website:** <https://www.apn-gcr.org/project/building-climate-resilience-in-farming-systems-in-sloping-lands-of-south-asia/>

**About:** The research-based project aims to assess the resilience and characterization of diverse farming systems in hilly areas in South Asia (SA) based on their adaptation capacities, with special emphasis on food and nutrition security, by utilizing the available information including climate data.

- **Grant Title:** Genetic Characterization of native goat & Sheep types in Sri Lanka  
**Funding body:** International Atomic Energy Agency - Austria
- **Grant Title:** Diversity of Sri Lankan rice cultivars is storing heavy metals in rice grains  
**Funding body:** Alexander von Humboldt Foundation  
**About:** The concentration of mineral elements in rice seeds can vary depending on the level elements in rice seeds can vary depending on the level of soil fertility and seed polishing. Those effects were evaluated using 54 Sri Lankan rice varieties.
- **Grant Title:** Genetic Characterization of parasitic Resistant – 16124  
**Funding body:** International Atomic Energy Agency  
**Website:** <https://www.iaea.org/newscenter/news/new-crp-improving-efficiency-of-national-livestock-breeding-programmes-using-nuclear-and-related-genomic-information-practical-applications-in-developing-countries-d31030>
- **Grant Title:** Application of Nuclear & Genomic Tools to Enable the Selection of Animals with Enhanced Productivity Traits  
**Funding body:** International Atomic Energy Agency
- **Grant Title:** Assess and Monitor Nitrogen uses, losses, and related pollution, and finds sustainable;e solution to improve Nitrogen Use Efficiency in the Agriculture sector in Sri Lanka as a part of the regional  
**Funding body:** United Kingdom Research & Innovation  
**Website:** <https://sanh.inms.international/>
- **Grant Title:** Potentials and opportunities to invest in the horticulture industry in Sri Lanka  
**Funding body:** Netherlands Embassy of Sri Lanka
- **Grant Title:** Assessment Of quantity and quality of Doty yield under different cultivation systems for viable commercial farming Sri Lanka  
**Funding body:** Suriya Company Ltd and Japan International Co-operation Agency
- **Grant Title:** Building Capacity to Improve Air Quality in South Asia: Reducing Particulate Matter (PM2.5) Air Pollution Through Low-Cost sensor Network-Driven Policy Decision  
**Funding body:** DUKE University  
**About:** The main goal of this project is to develop and implement plans to reduce PM2.5 to more healthy levels in highly polluted regions in each country through a combination of low-cost satellite image-enhanced PM2.5 sensor networks, integrated with meteorological modeling and source apportionment.

# Capacity Building Grants

- **Grant Title:** Strategic support for accreditation of programs and internationalization at South Asian higher education institutes  
**Funding body:** European Union  
**Website:** <https://ssapi-project.net/>  
**About:** The project aims to uplift the standards of the higher education system of partner country HEIs, in line with international standards and policies. Training will focus on learning from EU partners and developing procedures to modernize the education system. The project will also address the academic policies, rules, and structures, as well as the teaching methodologies and delivery mechanisms for modernizing the overall system.
- **Grant Title:** Enhancing Governance, Management, and Reform in Sri Lanka Universities through Non-Academic Staff Training  
**Funding body:** European Union  
**Website:** <https://erasmus-plus.ec.europa.eu/projects/search/details/619185-EPP-1-2020-1-LK-EPPKA2-CBHE-JP>  
**About:** Currently, a number of programmes are in place in Sri Lankan universities to improve quality in the higher education sector. Due to limited resources and financial austerity, however, very few of them pay attention to improving the qualifications and skills of non-academic staff. This capacity-building project addresses this issue.
- **Grant Title:** Training Hub for Renewable Energy Technologies in Sri Lanka- THREE Lanka  
**Funding body:** European Union  
**Website:** <https://threelanka.com/>  
**About:** The main objective of “Training Hub for Renewable Energy Technologies in Sri Lanka- THREE LANKA” project is to address the existing skill gaps in Sri Lanka in the area of Renewable Energy Technologies.
- **Grant Title:** Strengthening University - Enterprise Collaboration for Resilient Communities in Asia  
**Funding body:** European Union  
**Website:** <https://drrcollab.org/>  
**About:** This project aims at tackling the often ad hoc, episodic quality of university-enterprise collaboration in the field of disaster resilience in the project partner countries.

- **Grant Title:** Graduate Climate Change adapted water management  
**Funding body:** European Union  
**Website:** <https://erasmus-plus.ec.europa.eu/projects/search/details/619456-EPP-1-2020-1-NO-EPPKA2-CBHE-JP>  
**About:** This project addresses knowledge building' to address water scarcity and water management in 3 partner countries in Asia.
- **Grant Title:** Improving Access to Science and Technology Higher Education in Resource-Poor Institutions through an open Platform for Technology-Enabled Active Learning Environment  
**Funding body:** European Union  
**Website:** <https://teal2.ait.ac.th/iterate11/DOAVDTh1.html/>  
**About:** This project will develop and deploy an open-access platform for the technology-enabled learning environment that will facilitate the design and delivery of quality ODL in Science & Technology higher education
- **Grant Title:** Curriculum Development on Europe Sri Lanka Capacity building in Energy Circular Economy- EUSL Energy  
**Funding body:** European Union  
**Website:** <https://euslenergy.com/>; <https://eusl.edu.lk/>  
**About:** This project will develop a fully digital master's degree programme in the field of energy.
- **Grant Title:** Developing Inclusive Education for Students with Disabilities in Sri Lankan Universities  
**Funding body:** European Union  
**Website:** <https://arts.pdn.ac.lk/incedu/index.html>  
**About:** The main objective of the project is to develop a system of support for equalizing opportunities for SWDs in Sri Lankan Universities. The project aimed at including SWDs in the higher educational institutes of Sri Lanka by accommodating and adapting suitable environments for them. The main activities of the project include; the establishment of a model support center, developing staff competency and creating community awareness. The project consortium consists of 4 Sri Lankan Universities and 4 European Universities, European University partners contribute to the project as resource persons in carrying out the main activities of the project.

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- **Grant Title:** Sport and Physical Education as a vehicle for inclusion and recognition in India, Indonesia, and Sri Lanka  
**Funding body:** European Union  
**Website:** [spirit-eu.org](http://spirit-eu.org)  
**About:** The main goal of SPIRIT is to create a modular program in Sports, physical education, and Health Sciences in 3 countries of Asia that contribute to increasing the recognition of the fundamental value of sport and physical activity for the individual and society, well beyond competition, as a powerful tool for the promotion of healthy lifestyles and socioeconomic development.
  - **Grant Title:** Curriculum Development in Agroecology  
**Funding body:** European Union  
**Website:** <https://www.agroecologyproject.eu/>  
**About:** This project will introduce ecological rationality and methods into agriculture to minimize chemical inputs and costs, complement watershed and field conservation programmes, plan systems according to local resources and land capabilities and make efficient use of water nutrients and genetic resources.
  - **Grant Title:** European Initiative for Capacity Building to Meet the Challenges of Caring for people with neurodegenerative disorders in Sri Lanka  
**Funding body:** European Union  
**Website:** <https://neuro-care.lk/>

# Grants Received from the National Science Foundation of Sri Lanka

- Development of Innovative Shelter Hospital Buildings for Infectious Diseases
- An integrated application of the dynamic line rating and the solar PV inverter control to enhance the rooftop solar PV integration into distribution networks Design and Development of a decision support system to reconfigure the fruit and vegetable supply chain to enhance the food security
- Membrane fouling mechanism and control of high-pressure membrane processes (NF/RO) and electro dialysis (ED) purifying groundwater with DOM and high hardness in CKDu-affected areas of Sri Lanka
- Profiling of risks associated with veterinary drug residues in animal feed & food of animal origin to ensure consumer safety
- Value addition to chicken egg with enrichment egg yolk lipids with natural Conjugated Linoleic acid (CLA) having anti-cancer actions & subsequent commercialization of the value-added product
- Comparative analysis of climate resilient biodiversity of home garden ecosystems in different agro-ecological regions of Sri Lanka
- Quantification of the response of tropical rain forests of Sri Lanka to varying atmospheric temperatures for prediction of the impact of future climate change on their carbon balance and biodiversity
- Mapping of salinity development in paddy-grown soil using proximal and remote sensing-based techniques (NSF)

# Grants Received from the National Research Council of Sri Lanka

- Avian feathers as bioindicators of exposure to toxic trace elements and links between trophic position, genetic diversity, and reproductive success
- DNA Barcoding, Morphological Taxonomy and Phylogeny of *Syzygium* spp. of Family Myrtaceae in Sri Lanka: Implications for Conservation and Sustainable Exploitation
- Fabrication of Intelligent Textile Garment for Diabetes Patients with Features of Blood Glucose Sensing, Monitoring, Data storage, and Drug Delivery Systems combined with a mobile app
- Analysis of multidrug-resistant Extraintestinal Pathogenic *Escherichia coli* clones in humans and animals in Sri Lanka
- Shift in species composition and diversity of bee pollinators and natural enemies while enhancing crop yield in a highly dynamic agro-natural landscape
- Investigation and characterization of hantavirus infection in selected Districts and enhancement of hantavirus diagnostic facilities in Sri Lanka
- Canine tick-borne infections: reservoirs, tick vectors and zoonotic disease risk of rickettsial infections
- Household Food Waste Behaviors and Implications for Food Security and Environmental Sustainability in Sri Lanka
- Determination of Descriptor Values for Selected Volatile Constituents in Cinnamon, in order to determine their Distribution Levels in Environmental Compartments
- Fine-Tuning Electronic/Semiconductor Properties of an Iso-reticular Metal-Organic Framework Series to be Applied in Dye-Sensitized Solar Cells

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- Investigation of crop water usage and soil hydrological dynamics of oil palm (*Elaeis guineensis* Jacq.) and rubber (*Hevea brasiliensis* Muell. Arg.) plantations in the low country wet of Sri Lanka
  - Effects of environmental fluoride, hardness and heavy metal (Cd, Pb, As) exposures to the cow milk and their kidney function in CKDu endemic areas of Sri Lanka
  - Fourier transform infrared (FTIR) spectroscopy and, metabolomic screening with gene expression profiling of body fluids for early detection of Oral squamous cell carcinoma (OSCC).
  - Cryptogamic epiphytes as indicators of successional changes in tropical lowland rainforests in Sri Lanka
  - Mechanochemical synthesis of urea cocrystals as a sustained release nitrogen source
  - Design and Implementation of Microenvironment Conditions for Tea and Ornamental Foliage Plants using Precision Agriculture Systems Powered by Solar Photovoltaics
  - Developing a polyvalent anti-venom for snake bite in Sri Lanka
  - Development of eco-friendly farming technologies to minimize inorganic fertilizer usage while maintaining adequate productivity and improving soil fertility
  - Development of a novel polyherbal composition as drug lead for diabetes mellitus and dyslipidaemia from the selected medicinal plants in Sri Lanka
  - Isolation of local microbial consortia for efficient garbage recycling

# Grants Received from the Other Organizations

- **Grant Title:** Developing Technical capacity for detection & identification of LMOs strengthening biosafety-related infrastructure & to prepare educational materials in biosafety for different educational levels (FAO)  
**Funding body:** The Food & Agriculture Organization in Sri Lanka
- **Grant Title:** DNA fingerprinting using the genetic analysis of wild fauna and flora in Sri Lanka (Wildlife)  
**Funding body:** Dept. Of Wildlife Conservation
- **Grant Title:** Assessment Of Climate Change On Crops And Agronomic Indices  
**Funding body:** The Food & Agriculture Organization in Sri Lanka
- **Grant Title:** Conducting a city region food system (CRFS) food flow mapping in Sri Lanka  
**Funding body:** The Food & Agriculture Organization in Sri Lanka
- **Grant Title:** Data Verification and Analysis of food flow mapping in Sri Lanka  
**Funding body:** International Water Management Institute
- **Grant Title:** Developing capacities of city regions food systems (CRFS) institutions and players  
**Funding body:** The Food & Agriculture Organization in Sri Lanka
- **Grant Title:** Delivering training programs to chosen beneficiaries on plant nursery management  
**Funding body:** The Food & Agriculture Organization in Sri Lanka
- **Grant Title:** Feasibility study of virgin coconut oil in ameliorating type 2 diabetics in human  
**Funding body:** Coconut Research Institute
- **Grant Title:** Identifying the impacts of climate change on soil hydrological and dynamics in selected cropped fields in the Dry Zone of Sri Lanka  
**Funding body:** Council for Agricultural Research Policy
- **Grant Title:** Investigation on the role of water stress and climate change on forest dieback at Horton Plains  
**Funding body:** Council for Agricultural Research Policy



