



# PGIA News

The Newsletter of the Postgraduate Institute of Agriculture, University of Peradeniya



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## ABOUT THIS NEWSLETTER

Established in 1975, the Postgraduate Institute of Agriculture (PGIA), affiliated to the University of Peradeniya is a prestigious institution devoted to the development of higher level manpower in agriculture and related areas in Sri Lanka. During its four decades of existence, it has made tremendous progress in developing nationally and internationally important consortium of degree and non - degree programmes together with necessary infrastructure for teaching and research. Its biggest strength is the availability of qualified and experienced staff, both from within the university and outside research and development institutes and linkages with many reputed international universities and research centers.

PGIA NEWS is the main organ for the communication of various activities of the institute to the policy makers, academic community, stakeholders and the general public. It is published bi-annually and incorporates current news, research briefs and other information relating to agricultural education, research and development. The PGIA requests comments/suggestions from the readers on this newsletter if any, to improve its quality and content in the future issues.

## ACADEMIC NEWS

### PROF. DEMATAWEWA APPOINTED AS NEW DIRECTOR-PGIA



Prof. C.M.B. Dematawewa, a Professor in the Department of Animal Science, Faculty of Agriculture, University of Peradeniya assumed duties as the 9th Director of the PGIA on 9 November. A highly qualified professional in Animal Science, Prof. Dematawewa has served the Faculty of Agriculture, University of Peradeniya for 31 years. Prof. Dematawewa holds B.Sc Agric. (Hons) from University of Peradeniya, Postgraduate Diploma from University of Edinburgh, UK and M.Sc and Ph.D degrees from the Iowa State University, USA.

Prof. S. Samita, the previous Director of the PGIA completed his term of office on 5th August and Prof. D.K.N.G. Pushpakumara, Dean, Faculty of Agriculture served as Acting Director thereafter, until the assumption of duties by Prof. Dematawewa as the New Director of PGIA.

### PGIA'S COLOMBO BRANCH COMMENCE DEGREE PROGRAMS

Newly established Colombo branch of the PGIA located at the Kotalawela Defense University, Ratmalana has commenced degree programs for the new academic year on 23 September. This branch was established in 2017, especially to cater to the students employed in the industrial sector in the capital city. In the current year M.Sc programs in Food Science and Technology, Applied Statistics and Biostatistics will be offered by this branch.

### PGIA STUDENTS PRESENT RESEARCH PAPERS AT INTERNATIONAL CONFERENCES

The following students were selected to make oral presentations at international conferences and they were partially sponsored by the PGIA.

**Ms. N.A. Sanjeevani (M.Phil.)** of the Board of Study in Agricultural Biology attended the International Congress on Diabetes and Metabolism held in Seoul, S. Korea during 28 – 30 September. Her paper was on Hypoglycemic activity of ethanolic leaf extracts of *Adenanthera pavonina* L.

**Ms. E.D.J. Prince (M.Phil.)** of the Board of Study in Agricultural Engineering presented a paper on the Assessment of the relationship between water surface temperature and dissolved oxygen to identify aquatic vegetation distribution in Batticaloa lagoon, Sri Lanka at the 38th Conference of Remote Sensing held in India during 23 – 27 October.

**Ms. I.K. Edirisinghe (M.Sc.) and Ms. Dhanesha Nanayakkara (M.Sc.)** of the Board of Study in Agricultural Biology presented papers on “Comparative analysis of leaf vein density in Sri Lankan rice varieties” and “A novel molecular marker for bacterial leaf blight resistance gene *Xa21* in rice”, respectively at the 6th NGGIB-CI Conference on Crop Genomics, India held during 6 – 8 December organized by the International Crop Research Institute for Semi Arid Tropics (ICRISAT), Hyderabad, India.



## ACADEMIC NEWS

**Ms. A. Ashani (M. Phil.)** of the Board of Study in Agricultural Biology presented a poster on “Sea surface temperature anomalies and status coral reefs at the Kayts and Karainagar Islands of Jaffna peninsula, Sri Lanka” at the Zoological Society of London and Coral Reef Conservation Committee, UK. It was displayed at the European Coral Reef Symposium held at the University of Oxford’s Examination School during 13 – 15 December.

### ADMISSIONS FOR THE ACADEMIC YEAR 2018 EXTENDED

Applications for the new academic year were called and over 500 applications have been received by 25 November. Considering the requests for postponement of the deadline closing date for applications was extended until 22nd December 2017.

The PGIA offers several degrees, some with course work, some with coursework and research, and the others as full time research degrees and the demand for registration each year remains at a high level.

### PERADENIYA UNIVERSITY / PGIA OFFER JOINT DEGREES WITH QUEENSLAND UNIVERSITY OF TECHNOLOGY (QUT)



PGIA has established a collaboration program with Queensland University of Technology (QUT), Australia. Under this collaborative program, three students enrolled for Ph.D degree programs at the PGIA have been selected by the University Grants Commission (UGC) to follow joint degree programs at the QUT, Australia. These students are Ms. A.M.N.L.Abeysinghe from Board of Study in Animal Science, and Ms. C.K. Pathirana and Ms. M.T.M.Perera from Board of Study in Agricultural Engineering. These students will receive scholarships for one year to undertake research at the QUT and continue their work for the next two years at the PGIA. Under this collaborative arrangement degree will be awarded jointly by Peradeniya and QUT.

## ACADEMIC NEWS

### STUDENTS FOLLOWING GEOINFORMATICS PROGRAMME PARTICIPATE IN ESRI INTERNATIONAL USER CONFERENCE

Nine students following the Postgraduate degree program in Geoinformatics (2015/2016) attended the Annual “Environmental Systems Research Institute (ESRI) International User Conference” held at Convention Center, San Diego, California, USA during July 10th – 14th, 2017.

The ESRI User Conference (ESRI UC) is an occasion to share, collaborate, and learn the best practices developed in GIS technology. This conference provided ESRI software training and specific technical sessions conducted by the ESRI staff.

Prof. Ranjith Premalal De Silva of the Board of Study in Agricultural Engineering also participated in this conference.





### STAFF CHANGES/ NEW APPOINTMENTS

#### DAMUNUPOLA APPOINTED AS DEPUTY REGISTRAR

- Mr. K.A.B. Damunupola was appointed as Deputy Registrar of PGIA on 01 August. He holds a B.Sc (Agric), Peradeniya and MBA from Kelaniya University.
- Ms. Samudrika Herath, the previous Deputy Registrar of the PGIA was transferred to the Senate of the Peradeniya University on 01 August.

#### OUTBOUND TRAINING FOR PGIA STAFF

The staff of the PGIA participated in a 2 day outbound training program on 25 – 26 June at the Silver Eagle Adventure Park, Werapitita, Teldeniya.



### STUDENT EXCHANGE PROGRAMMES

#### RIENZIE AWARDED OVERSEAS TRAINING IN CAMBRIDGE UNIVERSITY, UK

Mr. Ryan Rienzie of the B/S Plant Protection Technology was awarded a Postgraduate Student Visitor position at the Jones Research Group, Department of Chemistry, University of Cambridge, United Kingdom from 15/09/2017 to 20/10/2017. There, he carried out a study on solubility of agrochemicals. In parallel to that he was trained on advanced material characterization techniques under the supervision of Dr. A.N. Madusanka (Teaching Fellow/ Postgraduate Institute of Science, University of Peradeniya/ Senior Lecturer, University of Sri Jayewardenepura) and Professor William Jones (Professor, Department of Chemistry, University of Cambridge). This study will be further continued in collaboration with University of Peradeniya, University of Sri Jayewardenepura and University of Cambridge.



Mr. Rienzie also presented a paper titled “*In-vitro* antimicrobial properties of carboxymethyl cellulose spray coated copper-montmorillonite nanocomposites” at the 10th International Conference on Agriculture and Horticulture, held in London, UK on 2-3 October, 2017. This study was conducted by Mr. Rienzie as a directed study under the supervision of Prof. Devika De Costa (Supervisor/ Chairperson of the B/S Plant Protection Technology) and Dr. A.N. Madusanka (Co-Supervisor). Also he attended the Materials Chemistry Conference of the Jones Group.



#### SANURI SELECTED FOR ERASMUS MUNDUS STUDENT EXCHANGE AWARD

Ms. S. Ratnayake (M.Sc.) of Board of Study in Agricultural Economics has received Erasmus Mundus Student Exchange Award to continue her studies for one semester at the Middle East Technical University (METU, Turkey).

#### PGIA ESTABLISH RESEARCH FACILITATION FUND (RFF) TO PROMOTE POST-GRADUATE RESEARCH

PGIA has established a Research Facilitation Fund (RFF) to promote postgraduate research of students. Since its establishment in 2010 over 20 students were supported by the RFF. Annually, Institute allocates over Rs. 2 mn. rupees for this fund. Many students who carry out research of national importance are facilitated by this fund. The Institute entertains applications for the fund throughout the year and select research proposals of national importance for funding. So far 3 Ph.D and 2 M.Phil. degrees have been awarded with funds provided by the RFF.





### FULBRIGHT COMMISSION, USA HOLDS AWARENESS PROGRAMME ON TRAINING OPPORTUNITIES IN USA

The above programme was organised by the Postgraduate Agricultural Students Association (PASA) on 26th August at the Appadurai Auditorium with the Fulbright Commission of USA. Ms. Edna Selvanayagam and Ms. Nathasha Dissanayake, Student Advisors of Fulbright Commission in their presentations focussed on the benefits of the American Corner and the opportunities available for students such as scholarships for higher studies in America, educational facilities and the training programmes etc.

PASA also organised similar programme for the undergraduates of the Faculty of Agriculture on 25th September and many students enthusiastically participated in this programme. Ms. Menusha Gunasekera and Ms. Inoka Rathnayake were the programme coordinators and Mr. Damith Walisundera, Youth Forum Coordinator of the American Corner participated as resource persons.



### B/S IN AGRIC. EXTENSION CONDUCT RESEARCH PROGRESS REVIEW

A progress review was organized for the students registered for research degrees in the B/S in Agricultural Extension on 27 October. Students registered for M.Phil. & Ph.D. programmes presented their progress and received critical feedback from the members of Board of Study. Prof. W.A.D.P. Wanigasundara, Drs. Wijaya Jayatilaka, Chandana Jayawardena and B.M.K. Perera provided critical feedback.

### SEMINAR ON ACCESSING AND EXCELLING IN PUBLIC SERVICE CAREERS IN SRI LANKA

Board of Study and the Department of Agric. Extension jointly organized an awareness seminar on 26 August for the students on entering the SL Administrative Service (SLAS). The seminar focused on the mission of the Public Service of Sri Lanka, its scope and opportunities for career progress.



**Ms. Subajiny Sivakanthan**  
M.Phil.

**B/S in Food Science and Tech.**

**Senior Supervisor**

**Prof. W.M.T. Madhujith**

### ENZYMATIC INTERESTERIFICATION OF SESAME AND COCONUT OILS TO PRODUCE NUTRITIONALLY SUPERIOR OILS AND EVALUATION OF THEIR OXIDATIVE STABILITY

The objective of this study was to produce a nutritionally superior structured lipids through enzymatic interesterification of coconut (*Cocos nucifera*) and sesame (*Sesamum indicum*) oils and evaluating their oxidative stability. Lipases derived from *Thermomyces lanuginosus* and *Rhizomucor miehei* were used. Reaction parameters were optimized through Response Surface methodology.

The optimum conditions for interesterification carried out using lipase derived from *T. lanuginosus* were temperature; 45 °C, time; 40.24 h and weight ratio of CO:SO; 70:30 while the corresponding values for the reactions carried out using lipase derived from *R. miehei* were 57 °C, 16 h and 50:50. Physico-chemical properties of both structured lipids differed significantly from those of the blend. Both interesterified oils contained a balanced proportion of SFA:MUFA:PUFA than their blends and contained less quantity of saturated fatty acids.

Both interesterified oils exhibited poor oxidative stability compared to their blends. Addition of butylatedhydroxytoluene (BHT) at 200 ppm significantly improved the oxidative stability of interesterified oils. Both structured lipids had a shelflife of at least 14 months at ambient temperature without added antioxidants and had shelflife of at least 21 months at ambient temperature with added antioxidants. It is concluded that both lipases are promising catalysts to mediate the interesterification reactions of coconut and sesame oil to produce nutritionally superior structured lipids with improved physical and chemical properties.



**Ms. R.M.S. Wijerathna**  
M.Phil.

**B/S in Agricultural Extension**

**Senior Supervisor**

**Dr. H.V.A. Wickramasuriya**

### FACTORS AFFECTING THE OUTREACH ENGAGEMENT BY ACADEMICS OF THE FACULTIES OF AGRICULTURE IN THE STATE UNIVERSITIES OF SRI LANKA

Research on outreach activities of Faculties of Agriculture in state Universities of Sri Lanka aiming at agriculture related knowledge transfer, is meager. Therefore, the focus of this study was to investigate the outreach engagement by academic of the in these state Universities and

determine the factors that would predict the intention to engage in outreach activities by application of Theory of Planned Behavior (TPB).

A structured questionnaire was e-mailed and posted to randomly selected academic staff of all eight Faculties of Agriculture (N = 257; 67% of academic staff) of the total 126 filled questionnaires (49 %) were returned. Structured interviews were also conducted with key informants. According to the results, the average number of outreach activities/academic year was 2.9 and the majority spent less than 5% of their working time on these activities, depicting a low involvement in outreach. The most common type of outreach activity was trainings (32%) conducted for the community including farmers, school children and the general public. Other outreach activities were workshops (24%), seminars (21%), consultancies (15%) and development projects (8%). The general mechanism to engage in outreach activities was through personal or informal contacts (44%), followed by contacts through Deans of the Faculties or Heads of the Departments (37%) and outreach Centres/Teams (18%). Established universities were engaged in more outreach activities than the newly established universities. Application of the theory (TPB) along with additional variables could explain 39% of the total variability of intention of the academics to engage in outreach. In general, satisfaction, recognition and rewards, subjective norms and positive attitudes towards outreach activities were the strongest predictors of the intention.



Current engagement in outreach activities by academics of the Faculties of Agriculture in the state universities is low. Less recognition and rewards, dissatisfaction leading to negative attitudes towards outreach, not having an outreach arm to coordinate outreach, less funding and financial flexibility, inadequate representation in the curriculum, and less publicity and inadequate linkages with outside are the main reasons identified for less outreach involvement by the academia. In this context, adequate infrastructure facilities should be developed especially in newly established Faculties of Agriculture. Flexible administrative procedures in financial handling for outreach activities and possible strategies to finance them should be explored. It is important to have clear missions for the faculties for outreach engagement and formal mechanisms to facilitate such engagement by academics.



**Mr. R.A.P.I.S. Dharmadasa**  
Ph.D.

**B/S in Agricultural Economics**  
**Senior Supervisor**  
**Prof. H.L.J. Weerahewa**

**IMPACT OF LABOR MIGRATION AND REMITTANCES ON POVERTY, INEQUALITY AND EXPENDITURE PATTERN OF THE ESTATE SECTOR, SRI LANKA**

Migration and inward remittances is a global phenomenon which is helpful in changing economies of individual households, societies, regions and countries in the developing world. However, there is a continuing debate over its impact on the developing nations despite the ever-increasing size of international remittances. Therefore, this study was undertaken to find the impact of migration and remittances on the poverty, income inequality and gender specific expenditure pattern of the estate sector of Sri Lanka. The results revealed that the poverty levels of the estate sector was reduced while income inequality widened as a result of these remittances. Moreover, male headed households spend more on housing while female headed households spend more on education using these remittances. Appropriate policies should cover the improvement in education facilities, development of infrastructure, facilitating remittance inflow, encouraging productive use of remittances, making aware of migrants regarding the financial services, providing training facilities to migrants, encouraging households to invest in human capital, micro enterprises and entrepreneurial activities, providing childcare facilities, and incorporating migration dynamism into



**M.M.J.G.C.N. Jayasiri**  
M.Phil.

**B/S in Agricultural Engineering**  
**Senior supervisor**  
**Dr. N.D.K. Dayawansa**

**ASSESSMENT OF ENVIRONMENTAL FLOW REQUIREMENT IN DOWNSTREAM OF DEDURU OYA RESERVOIR FOR SUSTAINABILITY OF THE ECOSYSTEM**

River ecosystems are interlinked with river hydrology. However, dam construction modifies the natural flow patterns leading to unpredictable consequences. Environmental flows (EF) can restore ecosystems or reverse the already occurred degradation. Considering its importance, several methods has been developed to estimate the EF. Objectives of this study was to compare EF assessment methods to identify existing gaps and, to develop a novel approach to estimate EF based on the minimum information requirement concept and assess EF. Among the EF calculation methods studied, holistic methods was identified as the best and the building block methodology (BBM) was identified as the best holistic method, but requires more resources.

The new methodology developed to assess EF basically was based on BBM but efforts were taken to apply minimum data requirement approaches to assess individual water users; flow requirement of riverine flora and fauna, social and cultural water requirement, wetland water requirement, longitudinal connectivity, flushing flow requirement, groundwater recharge and coastal water requirement. The EF requirement of downstream of Deduru Oya reservoir was estimated using the developed method. The results were compared with the EF calculated using the Sri Lanka Environmental Flow Calculator model developed by IWMI.



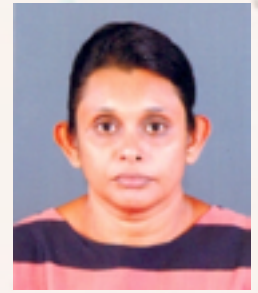
**Mr. D.M.N. Diyawadana**  
M.Phil.

**B/S in Agricultural Engineering**  
**Senior Supervisor**  
**Dr. S. Pathmarajah**

**IMPACT OF CLIMATE CHANGE AND POLICY ENVIRONMENT ON RURAL SMALLHOLDER FARMERS IN HAKWATUNA-OYA SCHEME IN SRI LANKA**

Climate change impacts have affected the food security of rural smallholder farmers who are vulnerable and have less adaptation and resilience capacities. Therefore, this study was conducted with smallholder farmers in Hakwatuna-oya major irrigation scheme, in Kurunegala district. In this area, more than 60% of the farmers own less than 1 ac (0.4 ha) of agricultural lands and most of the farmers earns less than Rs. 5000 of monthly income.

Most of the farmers perceive that temperature is increasing and rainfall is decreasing, increasing drought incidences, seasonal changes and unpredictability of rainfall in the area. Their perception on climate change is significantly influenced ( $P < 0.01$ ) by socio-economic condition. Adaptation is highly influenced ( $P < 0.01$ ) by the perception of the smallholder farmers. According to the index based study, sensitivity and adaptive capacity to climate change is found to be influenced by many socio-economic and geographical factors such as population density, education, chronic diseases, dependency, poverty, road density and assured drinking water sources. Vulnerable GN divisions account for 38% of the land area and 41% of the population. Policies have to be focused on livelihood diversification programs, credit facilities and crop insurance to strengthen the farmers socio-economically to increase resilience. Awareness creation and capacity building efforts related to climate change are essential. Farmers need to be made aware of the institutions together with services they provide. Further, extension service has to be strengthened.



**Ms. H.K.P.P. Kariyawasm**  
Ph.D.

**B/S in Agricultural Engineering**  
**Senior Supervisor**

**Dr. K.S.P. Amaratunga**  
**DEVELOPMENT OF A MATHEMATICAL MODEL FOR EVAPORATIVE COOLING OF ROUGH RICE (Oryza sativa L.) IN DEEP BED**

In this study a method of grain evaporative cooling was tested by intermittent humidification and dehumidification of grains using humidity controlled ambient air. A grain bed was initially aerated with saturated ambient air (humidification) for predetermined time periods of 3.5 and 7 minutes and subsequently the grain bed was ventilated with ambient air (dehumidification). The grain temperature data were collected using a bed of rough rice (height 0.15 m) in a 0.11 m diameter circular bin. The humidification period of 7 minutes led to an average temperature drop of 3.3°C compared to 3.5 minutes humidification period in which the drop was 2.1°C. The process of heat and mass transfer in the evaporative cooling process was mathematically simulated for predicting the grain temperature in a deep bed of rough rice. The numerical solutions of the model were approached by finite difference method. The inlet temperature and relative humidity of air were used as the model inputs. The model was validated using the results obtained from the grain evaporative cooling tests.



The measured and predicted grain temperatures at different layers were in close agreement over the test period with an accuracy of  $\pm 0.5^\circ\text{C}$ . Thus this developed mathematical model can be used in predicting the grain temperature of rough rice in similar applications.



**Mr. M. Rajendran**  
M. Phil.

**B/S in Agricultural Engineering**  
**Senior Supervisor**  
**Prof. E.R.N. Gunawardena**

## APPLICATION OF HYDROLOGICAL MODELS TO DETERMINE STRATEGIES FOR WATER ALLOCATION TO DIFFERENT USERS WHILE IMPROVING THE LIVELIHOODS

Development of catchment scale hydrological model, assessment of water demand and analysis of different management scenarios are vital to develop appropriate water resources management plan. In this study, rainfall-runoff relationship was developed using HEC-HMS and WEAP. Current water demand was estimated and compared with future water demand under different climate scenarios. Scenario analysis was done using WEAP. The results showed that HEC-HMS and WEAP models adequately simulate runoff from Hakwatuna Oya catchment. However, HEC-HMS is preferred over WEAP for daily simulation. Water requirement of  $3\frac{1}{2}$  months paddy was found to be 1282 mm in Maha and 1381 mm in Yala seasons. Climate projection showed that

water deficit would reduce from 28% to 18% and 28% to 20% in Maha, and 30% to 24% and 30% to 26% in Yala in 2050s under A2 and B2 scenarios, respectively. Further, under average flow condition, nearly 32MCM of additional water supply is required to satisfy the needs of all water use sectors. Diversion of 5MCM water with 100% OFC cultivation or 10MCM water diversion with 75% OFC cultivation is adequate to meet water demand of agricultural sector while ensuring domestic water supply at the rate of 80liters/person/day and 10% and 2% of average annual flow for environment and industrial uses, respectively under changing hydrological flow.



**Ms. Loha Pradheeban**  
Ph.D.

**B/S in Crop Science**  
**Senior Supervisor**

**Prof. N.A.A.S.P. Nissanka**

**IDENTIFICATION OF SALINITY TOLERANT RICE VARIETIES AND SUITABLE SALINITY MITIGATION MANAGEMENT MEASURE FOR SUSTAINABLE RICE CULTIVATION IN SALT AFFECTED AREAS IN JAFFNA DISTRICT OF SRI LANKA**  
The results of series of experiments showed that tolerance to salinity varies with rice varieties and their growth stages. Based on seed germination, seedling growth and survival, varieties tested could be categorized into highly tolerant (Pachaperumal, CO 10, Adakari, Bg 369), tolerant (At 353, At 354, H4), sensitive (At 308, Bg 352) and highly sensitive (Bg 360, Bg 450) to salt.

Germination energy, speed of germination, final germination, coleoptile length, root length, shoot height, shoot dry weight, root dry weight, root surface area, root to shoot ratio and sodium to potassium ratio in shoots could be used as indicators to screen the varieties at seed germination and seedling stages. Among the varieties cultivated in Jaffna, based on seedling growth, development, physiological and biochemical analysis, Pachaperumal and Adakari could be categorized into salinity tolerant and At 308 and Bg 352 as highly salinity sensitive. Application of farmyard manure and deep ploughing reduced the salinity impact in salt affected fields in Jaffna. Among the cultivated varieties in Jaffna, Pachaperumal (3 months) and Adakari (3 1/2 months) could be recommended for the salt affected field sites in Ariyalai. Variety Bg 369 also can be introduced to Jaffna by giving awareness about the variety growth and yield performance in salt affected areas. In addition, planting date of rice can also be adjusted to one week after the onset of Maha rains in salt affected fields by using three and three and a half months rice varieties tolerant to salinity.



**Ms. K.D.M.S.S. Sarathchandra**  
M.Phil.

**B/S in Agricultural Engineering**  
**Senior Supervisor**  
**Dr. N.D.K. Dayawansa**

**ASSESSMENT OF THE PERFORMANCE OF RIPARIAN BUFFER ZONES ON AGRICULTURAL WATER POLLUTION CONTROL: A CASE STUDY IN NUWARAELIYA**

The objectives of this study were to identify ideal conditions for a well performing buffer zone which remediate the degraded water quality using locally available plants in Nuwara Eliya. The methodology included soil and water analysis, mapping of soil nutrient distribution of the area using GIS, a questionnaire survey and conducting a field study to re-evaluate the conditions of riparian buffer zones with locally available plants. Farmer selection criterion was close proximity of the lands to the adjacent water source. Information gathered were fertilizer and pesticide usage, agronomic practices and knowledge about the riparian buffer zones in Moon Plain and Black Pool. Surface and shallow groundwater samples were collected representing natural, agricultural landscapes to test pH, EC, Nitrate and Phosphate. Soil samples were collected from a study area which were under land preparation, cultivation and after harvesting at 0-10 cm and 10-20 cm depth. Total nitrogen, available phosphorus, organic matter, pH, electrical conductivity, salinity, total dissolved solids were analyzed using standard procedures. Inverse distance Weighted interpolation technique was employed to mapping. A field experiment was conducted with 0.5 m, 1.0 m and 2.0 m buffer widths, 1, 3 and 7 day retention times, 32 mg/L and 40 mg/L initial concentrations of Nitrate with Water cress and Indian mustard plants to assess the most suitable parameters for efficient nitrate removal using a riparian buffer zone. Results revealed that, majority of the farmers were males in age group 30-40 years.

Eighty percent of the lands varied between 0.04 - 0.2 ha and 67 % were in medium slopes. Majority of the lands were owned by the farmers. They were aware of the water pollution and knowledge is transferred via generations not by the education. Nearly 73% of the respondents were aware on riparian buffer zone as a soil runoff control method but not as a water quality improvement method. However, landlessness is the main reason for unavailability of the riparian buffer zone. In water sample analysis, high Electrical Conductivity was reported in water draining cultivated area. Higher nitrate (32 mg/L) was reported in shallow groundwater and lower level of P was observed in both vegetable cultivated areas and natural forest. According to the field experiment, Water cress was the most effective plant type. The highest flow length (2.0 m) is the most effective in removing nitrate. The most effective retention time in removing nitrate is one day with 32 mg/L initial concentration and 7 day with 40 mg/L initial concentration.



**Mr. K. Jeyavanan**  
M.Phil.

**B/S in Crop Science**  
**Senior Supervisor**  
**Prof. D.K.N.G. Pushpakumara**

**ASSESSMENT OF ENVIRONMENTAL SERVICES OF HOME GARDEN AGROFORESTRY IN JAFFNA DISTRICT**

As natural forest cover of Jaffna district is around 2 % of the land area, homegardens have to play a key role to provide environmental services, namely provisioning, regulating, cultural and supporting services. Unlike in the other areas of the country, homegarden agroforestry has received little attention from researchers and policy makers in the Northern provinces. Hence, this study was carried out in the Jaffna district to assess the environmental services of homegarden agroforestry. Different methodological approaches were used to obtain the necessary data for identification of environmental services of homegardens agroforestry. A total of 125 homegardens were surveyed with mean extent of 0.2 ha. The extent of the homegardens had a positive correlation with species richness and diversity. Age of the homegardens had not influence the carbon stock and number of tree species. A total of 5,920 individual flora were assessed from 58 families and 135 species and a total of 825 individual domestic fauna were identified from 19 species and 12 families. Provisioning services were obtained from both floristic and faunal components. Mean above ground carbon stock was  $41 \pm 4$  Mg C/ha. Unique features of the Jaffna homegardens were the high prevalence of live fence and domestic fauna. This study revealed that homegardens in Jaffna district were a versatile multi-functional system and all categories of environmental services had been provided to the owners of homegardens in the district. In future studies, attractive landscape features and potential of improvement of homegardens through the process of replacement, substitution, expansion and management of tree components, mapping of environmental benefits are suggested.



## RESEARCH BRIEFS



**Mr. I.M.A.D. Nagalla**  
**M.Phil.**

**B/S in Agricultural Biology**  
**Senior Supervisor**  
**Dr. H.M.V.G. Herath**

### FUNCTIONAL AND COMPARATIVE GENOMICS OF GRAIN NUMBER, PLANT HEIGHT AND HEADING DATE 7 (Ghd7) IN SRI LANKAN RICE VARIETIES AND ITS ROLE IN CONFERRING ABIOTIC STRESS TOLERANCE

The grain number, plant height, and heading date7 (Ghd7) act as a key regulator in monocot specific flowering pathway with regulatory effects on yield related traits such as number of spikelets/panicle, plant height and flowering time. Under long-day conditions Ghd7 codes for a protein contains CO, CO-LIKE and TIMING OF CAB1 (CCT) domain. In this study, evolutionary relationships of putative orthologs of Ghd7 within the genus *Oryza* was assessed by considering nucleotide diversity, gene tree and synteny of Ghd7 from nine *Oryza* species using Ghd7 orthologs and adjacent genes. Ultimately, complex evolutionary pathway and gene movement across syntenic and non-syntenic regions of the Ghd7 were observed. Among the previously identified Ghd7 haplotypes, three allelic haplotypes (H2, H5 and H11) were identified from a panel of 34 Sri Lankan rice varieties.

Further, 13 putative novel haplotypes were identified, and were declared as tentative due to low occurrence frequency (< 5%). Plants alter their morphological architecture to improve tolerance against abiotic stresses. Ten rice varieties were clustered based on ten morphological parameters taken under well-watered conditions and their associations to relative water content (RWC) under drought was assessed. Morphological characters before exposure to drought such as plant height, leaf length, culm length, leaf width and leaf angle, together has an effect on the RWC of a plant under drought. Elevated Ghd7 expression has been reported under abiotic stresses. However, the variety At354 revealed no significant ( $p > 0.05$ ) difference in gene expression under drought, and salinity conditions over the peak expression period of Ghd7 (15th to 23rd days after germination) and thus, for At354 the involvement of Ghd7 in conferring drought and salinity stress responses were not significant.



## CONFERENCES, SEMINARS AND WORKSHOPS

### SHORT COURSE ON INTEGRATED WATERSHED MANAGEMENT

Board of Study in Agric. Engineering conducted a Short Course in integrated water resource management (IWRM) from 3-6 July at the PGIA for 28 participants from World Vision, Sri Lanka. All resource persons were from the B/S in Agric. Engineering. Prof. Nimal Dharmasena Coordinated the above Course.

### TRAINING WORKSHOP TO DEVELOP WATERSHED DEVELOPMENT PLAN FOR DOMESTIC WATER SUPPLY PROJECTS OF NUWARA ELIYA DISTRICT

The above workshop was organized by CAP- NET, Lanka at the NCM Lanka Training Center, Hatton on 21 September for 20 participants of the Sannon and Lionorn Estates of the Nuwareliya district. Dr. S. Pathmarajah, Country Coordinator, CAP-NET Lanka coordinated this program. The resource persons of this workshop were Dr. H.B. Nayakakorale, Visiting Lecturer in Agric. Engineering and Ms. R. Sudharshani, M.Phil student of the Board of Study in Agric. Engineering. The workshop was sponsored by the World Vision Lanka.

### TRAINING ON REVERSE OSMOSIS SYSTEM DESIGN, MAINTENANCE AND SERVICING

CAP-NET, Lanka jointly with the Board of Study in Agric. Engineering organized the above training program on 11 August. Dr. Jatal Manapperuma, Visiting Fellow, Department of Agric. Engineering served as a resource person. Dr. T. Abeysekera, Consultant Nephrologist, Faculty of Medicine, University of Peradeniya delivered a guest lecture on "Water and Health". This program was coordinated by Prof. D.A.N.Dharmasena, Department of Agric. Engineering.

### CAP-NET LANKA HOLDS CORE GROUP MEETING

The Core-Group, which is the decision making body of the Network, meets on occasions when an agenda is ready for upgrading, analyzing of network activities. The group last met in year 2015 and recently on Friday, 21st July 2017 at the International Water Management Institute (IWMI), Colombo. Ten members and two invitees participated in the meeting.



## CONFERENCES, SEMINARS AND WORKSHOPS

### WATER PROFESSIONALS' DAY SYMPOSIUM 2017 - A SUCCESS

Water Professionals' Day Symposium was successfully held on 02 October, 2017 at the R. R. Appadurai Auditorium of the Faculty of Agriculture, University of Peradeniya under the theme of "Living with water related disasters; Challenges ahead and way forward". This was organized by the Geo-Informatics Society of Sri Lanka and Cap-Net Lanka together with the Postgraduate Institute of Agriculture. The chief guest of the inaugural session of the symposium was Prof. Upul B. Dissanayake, Vice Chancellor, University of Peradeniya. Dr. N.D.K. Dayawansa, Coordinator of the Water Professionals' Day Symposium, Prof. M.I.M. Mowjood, representing Dean, Faculty of Agriculture and Director/ PGIA, Dr. S. Pathmarajah, Coordinator, Cap-Net Lanka and Mr. S.D.P.J. Dampegama, President of the Geo-Informatics Society of Sri Lanka also addressed the gathering. A panel discussion was held on the theme of the symposium which was chaired by Prof. Ranjith Premalal De Silva, Department of Agricultural Engineering, University of Peradeniya. Eng. R.M.P. Karunaratne – Zonal Director, Irrigation Department, Kandy, Eng. P.H. Sarath Gamini – Project Director, Greater Kandy Water Supply Project, National Water Supply & Drainage Board, Katugastota, Ms. Nimali Weerasinghe, District Officer, National Building Research Organization, Kandy and Mr. R.S. Wijesekera, General Manager, Water Resources Board served as panelists. Eleven research papers were presented in three technical sessions on Governance, Environmental and Social Aspects in Water Management, Water Quality and Water Purification and Water and Ecosystems. CapNet Lanka-PGIA Junior Water Awards for the schoolchildren were a key attraction of the event.



### CAP-NET LANKA JUNIOR WATER AWARDS FOR INNOVATIONS AND KNOWLEDGE MANAGEMENT

The above ceremony was held on 2 October in parallel with the Water Professionals Day symposium. This year the junior water awards for innovations and knowledge management was conducted in schools of the Northern province and coordinated by Prof. Thushyanthy Mikunthan, Dean, Faculty of Agriculture, Jaffna University while Prof. M.I.M. Mowjood, Head, Department of Agric. Engineering coordinated the Aqua Republica program which was conducted in schools of the Central Province. A total of 68 school children from Northern and Central provinces and 65 water professionals participated in these events. Dr. S. Pathmarajah functioned as the overall coordinator of these programmes. The award winners are listed below.

## CONFERENCES, SEMINARS AND WORKSHOPS

### WINNERS OF JUNIOR WATER AWARDS

Winner - J/Pungudutivu Maha vidyalayam - Reclamation of saline water using organic fertilizer and impact on plant growth  
 1st runner up - J/Jaffan Hindu College - Liquid fertilizer production from kitchen waste  
 2nd runner up - Vidyananda College, Mullativu - Rain water harvesting  
 3rd runner up - V/Chendikulam Maha Vidyalayam – Developing wetland construction system for purifying household waste

### AQUA REPUBLICA AWARDS

Winner  
 H.A.W. Ratnayake - Dharmaraja, College, Kandy  
 1st Runner up  
 Kaviska Senadhira - Ranabima Royal College, Kandy  
 2nd Runner up  
 T. Gunasekera - Dharmaraja College, Kandy





## FORTHCOMING EVENTS ....

Commencement of academic sessions	04 June 2017
Workshop on scientific writing	14 November 2017
Training program on environment and social saguard management	9-10 November 2017
PGIA Annual Congress	16/17 November 2017
Orientation program for new students	10 March 2018

## M.SC./MBA PASS LIST - MAY TO NOVEMBER 2017

### B/S in Agric. Biology

Ms. W.M.A. Senavirathne  
Ms. P.A.M. Krishanthi  
Ms. W.M.E. Weerasinghe  
Ms. T. Balasubramaniam  
Ms. U. Rajagopalan

### B/S in Agric. Extension

Mr. T.A.U.K. Weerasekara  
Ms. K.P.B. Jayarathne  
Ms. W.D.D.K. Karunarathna  
Mr. R.G.S.S.K. Premarathne  
Ms. A. Prabahara  
Ms. G. Jeyarajah  
Ms. A.J.M.C.J. Walalawela  
Mr. A.P.S. Rupasinghe  
Mr. P.G.P.H.M. Amaradasa  
Ms. R.M.N.C.K. Ramanayake  
Ms. D.M.S.N.T. Jayasekara  
Ms. M.W.T. Karunarathne  
Mr. K.U.D. Jayasena  
Ms. D.N. Sumanasinghe  
Ms. C.M. Rodrigo  
Ms. K. Sarawanaluxmy

### B/S in Agric. Engineering

Mr. K.G.A.P. Kumburegama  
Ms. D.S.M.Fernando  
Mr. M.S.R. Akther  
Ms. T. Gopalakrishnan  
Ms. W.G.D.L.C. Wijesinghe  
Mr. H.C.Marasinghe  
Mr. H.D.N. Caldera  
Mr. P. Hariprasath  
Ms. V.L.M. Vitharanage  
Mr. M.P. Gunawardena  
Mr. C.K. Wickramatunga  
Mr. D.D.S.S. Weerasooriya  
Ms. P.K.G.T. Shashinkamali  
Mr. A.H.R.P. Abeysekara  
Mr. H.M.T.C.Madhushanka

### B/S in Soil Science

Ms. P.D.B.J. Palihakkara  
Ms. G. Tharani  
Ms. P. Rukshagini  
Ms. M.J.P.T.M. Jayasekara  
Ms. G. Venuthasan  
Ms. T.G.N.M.G.S.Nissanka  
Ms. R.D.M. Ranaweera

### B/S in Business Administration

Mr. B.A.S.P. Abesekara  
Ms. H.M.M.S. Senavirathne  
Mr. H.M.A.B. Herath  
Mr. D.G.C.S. Dicklewla  
Ms. A.M.K.M.A. Abeyrathne  
Mr. PAPK PalamuruArachchi  
Mr. J.L. Gunasekara  
Mr.S Thirugnanasampanthar  
Ms. K.P.K.L.P. Madhuwanthi  
Ms. W.M.L.K. Warnasooriya

### B/S in Bio-Statistics

Mr. B.G.P.S.V. Seneviratne  
Ms. N. Shaminy  
Mr. T.M.M.H. Tennakoon  
Mr. G.S.S. Gunawardana  
Ms. D.U. Wijesekara  
Mr. H.P.A.S.S. Kumarasinghe

## M.SC./MBA PASS LIST CONTD.

### B/S in Crop Science

Mr. R.L.K.G.N.U Gunasena  
Mr. D.D. Witharana  
Ms. I.P.N.P. Kumari  
Ms. U.D.R.E. Ruwanpura  
Mr. H.S.C.De .Z. Rajapakse  
Mr. L.S. Wewage  
Ms. A.M.W.K. Abeysinghe  
Ms. I.M.P.S. Ilangamudali  
Mr. N.P. Gunarathne  
Ms. R.T. Wasalthilake  
Ms. R.M.C.J. Rathnayake  
Mr. R.M.D.N. Ramanayake  
Mr. A.M.D.A. Abeysinghe  
Ms. L.A.N.D. Wijesiri  
Ms. Y.N.P. Wijerathne  
Mr. T. Venuthasan  
Mr. W.A.P.D. Wedisinghe  
Mr. A. Sugukumar  
Mr. K.R. Fernando  
Mr. S.A.S.T. Raveendra  
Mr. M.R.N.B. Weerasooriya  
Mr. W.M.R.B. Ekanayake  
Ms. D.M.S.S.C. Dissanayake  
Ms. G.Y.A.D.D. Perera  
Mr. A.M.P.A.S. Upekshitha  
Mr. H.G.J.T. Kumara  
Ms. B.M.S.S. Panditharathna  
Mr. R. Mambulage  
Ms. P.R.D.K. Pallegama  
Mr. A.M.S.N.N. Adikari  
Ms. N.P. Bandaranayake  
Ms. P. Sreesparalingam  
Mr. D.G.K.P. Wijerathne  
Ms. A. Wickramasinghe  
Mr. G.K.D.C.S Gunathilake  
Mr. A.M.D.T. Athapattu  
Mr. J.M.Y.B. Jayasundara

### B/S in Animal Science

Mr. K. Akilan  
Ms. A.M.A.N. Adikari  
Mr. S.V.P. Wickramasinghe  
Mr. T.B. Karunarathna  
Mr. L.P.I.N.P. Jayawardana  
Ms. E.J.S.P. Dilhari  
Mr. W.I.B. Amarasinghe  
Ms. P.N. Amarasekara  
Ms. D.I. Abeygunawardana  
Ms. C.S. Liyanage  
Ms. W.A.C.I. Perera  
Ms. M.AH. Sajeewani  
Ms. A.A.C.D. Chandraratne  
Ms. S.T.S.K. Warkaulle  
Ms. T.N. Haththotuwa  
Ms. W.M.A.D. Wanninayake

### B/S in Plant Protection

Ms. W.M.S.P. Wijekoon  
Ms. A.A.L. Attanayaka  
Ms. J.K.U. Ruwanmali  
Ms. M.S. Wickramarathne  
Ms. G.A.M.H.N.L.2 Gunarathne  
Ms. M. Thuraisingham  
Ms. H.P.D.T.H. Pathirana  
Mr. N.W.K. Wijesuriya  
Ms. A. Riffa  
Ms. V. Nivethika  
Ms. W.P.U.T. Warnasooriya  
Ms. L.H.S.N.Gunarathne  
Ms S. Karthiga  
Ms. R.D.R.R. Ranathunga  
Mr. F.L. Emerson  
Ms. D.I.N.Wanigasooriya  
Ms. S. Kodeeswaranathan  
Mr. N.N. Koswatte  
Mr. B.M.I.S.L.Bandara  
Ms. S.N.M.S. Ransirini  
Mr. M.M. Yapa

### B/S in Food Science & Tech.

Ms. M.G. Fernando  
Mr. W.L. Jayasinghe  
Ms. M.D. Madushani  
Ms. J.I.K. Hettiarachchi  
Ms. M.L. Wijesinghe  
Ms. T. Roopasingam  
Ms. K.W.H.R. Ekanayake  
Ms. E.M.C.C. Menike  
Ms. R.M.R.S. Tilakaratne  
Mr. S.C. Manage  
Ms. A.G.A.M. Aluvihare  
Ms. C.R. Dias  
Mr. A.N. Sirimanne  
Ms. P. Chandravarman  
Ms. T.M.S.N. Thennakoon  
Ms. K.P.D.A. Pathirage  
Ms. J.A.T.P.J. Sooriyanayake  
Mr. M.A. Kumara  
Ms. B.G.S. Jayarathna  
Ms. G.M.S.K. Ranathunga  
Ms. D.S.W. Rajapaksha  
Ms. D.V.S. Senevirathne  
Ms. P.A.Y. Pradeepika  
Ms. P.H.S.A.Dayarathna  
Mr. L.A.B. Lekamge  
Ms. T.M. Jayasinghe  
Ms. H.M.S.L. Herath  
Mr. K.D.K.K. Dissanayake

### B/S in Agric. Economics

Mr. S.Komahan  
Ms. M.L.R.P. Munasingha  
Ms. A.M.S.B. Athapaththu  
Ms. H.M.U. Iranjani  
Ms. B.D.S. Sampath  
Mr. A.P. A. Isurudewa  
Mr. M.G.S. Dayananda  
Mr. G.K.T.P. Bandara  
Mr. A.M.S.L. Bandara  
Ms. S. Sheromiha



## SOCIAL EVENTS

### PASA HELPS FLASH FLOOD VICTIMS AT NIVITHIGALA DS DIVISION

Postgraduate Agricultural Students Association (PASA) collected many items with the support of the students and staff of the PGIA and donated these items to the flood victims of the Nivithigala DS Division in collaboration with the Nivithigala Municipal Office on 8th June (Poson Poya Day). Further, PASA also conducted a full day programme for these people and their children organizing a Psychology programme and a medical clinic at Watapotha Vidyala of Nivithigala with the support of Arts and Medical students of the University of Peradeniya.

PASA also made donations to 16 flood victim undergraduates of the Faculty of Agriculture in the presence of the Director/PGIA, Dean, Faculty of Agriculture and Students Welfare Officers of the Faculty.



### PASA ORGANIZE BLOOD DONATION CAMP



Postgraduate Agriculture Students Association (PASA) organized a blood donation camp in June with the assistance of the Blood Unit of the Teaching Hospital, Peradeniya. The PGIA sponsored this campaign at which 92 persons donated blood.