

Nineteenth Annual Research Forum

**Sri Lanka Agricultural Economics Association
(SAEA)**

***“Innovations and Transitions: Driving Agricultural Change for
Economic Growth and Stability”***

Proceedings

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Presidential Speech

Innovations and Transitions: Driving Agricultural Change for Economic Growth and Stability

Dr Shamen P Vidanage, President/SAEA

Distinguished guests, esteemed representatives of government and development agencies, respected academics, industry leaders, practitioners, students, and members of the Sri Lanka Agricultural Economics Association (SAEA), it is my honour and privilege to welcome you to the 19th Annual Research Forum of SAEA. I am deeply grateful to each of you who have joined us today to reflect on the pressing challenges and emerging opportunities shaping Sri Lanka's agricultural sector.

The theme of this year's ARF - *"Innovations and Transitions: Driving Agricultural Change for Economic Growth and Stability"* - captures the essence of the moment we now inhabit. We stand at the confluence of multiple global and domestic transitions: environmental, technological, economic, and societal. Each of these transitions presents challenges, but more importantly, they present opportunities - opportunities to rethink, redesign, and reposition Sri Lankan agriculture for greater resilience and prosperity.

Agriculture remains central to Sri Lanka's economy, employing a large share of our labour force, sustaining rural livelihoods, ensuring food security, and contributing significantly to export earnings. Yet, the sector is under increasing pressure from climate vulnerability, rising input costs, land-use conflicts, soil and water degradation, demographic shifts, and persistent market inefficiencies.

The devastation caused across the country by the recent cyclonic storm, *Ditwah*, is not an isolated anomaly; rather, it reflects the emergence of a new climatic reality. Our farmers, who already operate with narrow margins and high uncertainty, now face unprecedented levels of risk. Recovery from cyclone-induced flooding or landslide damage often takes years, not months, and many affected regions struggle to regain their productive capacity.

At the same time, agricultural systems worldwide are undergoing rapid transformation driven by advances in digital technology, biology, engineering, data analytics, and sustainable resource management. This convergence of pressures and possibilities puts Sri Lanka at a defining moment. The question before us is not whether the sector should transform, but how it must transform - and how quickly.

This transformation cannot be incremental. It must be structural, holistic, and strategically coordinated, based on sound research, strong institutions, and long-term policy vision.

Innovation - scientific, technological, managerial, and institutional - is the catalyst of agricultural progress. For Sri Lanka, innovation holds particular promise in multiple dimensions:

1. Raising Productivity and Efficiency

New technologies such as precision farming, improved seed varieties, biotechnology applications, protected agriculture, digital advisory systems, and mechanisation offer pathways to significantly enhance resource-use efficiency and output.

2. Strengthening Value Chains

Post-harvest losses, weak market linkages, inadequate storage, and inconsistent quality continue to limit sectoral performance. Innovation in logistics, processing, cold chains, contractual arrangements, and traceability can add value, improve market competitiveness, and open new export opportunities.

3. Advancing Climate Resilience

Climate-smart agriculture practices—such as water-efficient technologies, agroforestry models, drought-tolerant varieties, sustainable soil management, and integrated pest management - are essential for protecting both livelihoods and natural resources.

4. Fostering Data-Driven Decision-Making

As agricultural economists, we recognize the importance of timely, reliable data in shaping policy and investment decisions. Improved data systems, modelling tools, and economic analyses enable better forecasting, risk assessment, and evidence-based policymaking.

5. Empowering Youth, Women, and Rural Entrepreneurs

Innovation can expand opportunities for entrepreneurship, promote inclusive participation, and create employment pathways in value addition, digital agriculture, and green technology.

Innovation is not the destination - it is the enabler of a broader transition towards sustainable, market-responsive, and competitive agriculture.

Transitions for Stability, Sustainability, and Equity

Agricultural transformation must foster not only growth but also stability - for farmers, markets, and the wider economy.

Strengthened market information systems, risk-transfer tools such as insurance, and predictable trade and pricing policies are critical for reducing volatility and building investor confidence.

Managing land, soil, water, and biodiversity sustainably is essential to the long-term viability of the sector. Sri Lanka's fragile ecosystems require careful stewardship, particularly in the face of climate change.

Effective extension systems, research institutions, regulatory frameworks, and financial services must evolve to support a new generation of agricultural producers.

Transitions must be just and inclusive, ensuring that smallholders—who form the backbone of our sector - benefit equitably from the opportunities innovation brings.

Strengthening SAEA's Contribution

The Sri Lanka Agricultural Economics Association continues to play an important role in strengthening research, policy dialogue, and professional development in the field of agricultural economics.

This year, we take further steps to expand our impact:

- We introduce Postgraduate Research Awards to complement our longstanding recognition of undergraduate research excellence in Agricultural Economics.
- We advance institutional reforms through revisions to the SAEA Constitution, reflecting our commitment to good governance and professional integrity.
- We have initiated the process of establishing SAEA under an Act of Parliament, a development that will strengthen the Association's stature, ensure continuity, and enhance its contribution to national policy discourse.
- We continue to deepen our partnerships with national and international institutions, recognising that agricultural transformation requires knowledge sharing and coordination across sectors.

I take this opportunity to acknowledge the invaluable contributions of our past Presidents, whose leadership has shaped the Association's vision and strengthened its foundations.

As we convene for this Annual Research Forum, I invite you to approach our discussions with a shared sense of purpose. The transformation we aspire to

will require: Bold policy choices, strategic investments, collaborative partnerships, and a commitment to evidence-based decision-making.

Agriculture must be positioned not merely as a sector to be protected, but as a dynamic engine of economic recovery, food security, and sustainable development.

Let us therefore use this Forum to articulate the pathways through which innovation can drive the transitions needed for agricultural change, economic growth, and national stability.

Let us reaffirm our collective responsibility to shape policies and programmes that uplift our farmers, protect our natural resources, and secure a resilient economic future.

And let us move forward with confidence, analytical rigour, and a long-term vision for Sri Lanka's agricultural sector.

Distinguished guests, colleagues, and friends,

I wish the 19th Annual Research Forum every success. May the insights and discussions that emerge today provide a strong foundation for the transformative journey ahead.

Thank you.

Keynote Speech

Unlocking innovations for inclusive and sustainable agriculture growth

*Dr Filipe Dizon, Senior Economist, Agriculture and Food Global Practice,
World Bank Group*

Unlocking innovations for inclusive and sustainable agricultural growth is essential for Sri Lanka's future. Growth in agriculture and food systems is foundational to prosperity - it drives jobs and reduces poverty, especially among the most vulnerable. Innovation is a central driver of agriculture growth, and while Total Factor Productivity (TFP) growth has helped reduce poverty and boost Sri Lanka's agricultural output, efficiency gains remain too weak to sustain strong productivity growth compared to regional peers. To truly accelerate progress, Sri Lanka needs to invest in innovation, while focusing on including the marginalized and on protecting natural resources. Supporting smallholder commercialization and fostering a healthy ecosystem for private sector innovation are crucial steps toward building a more competitive, inclusive, and sustainable agrifood system.

(1) Growth in agriculture and food systems is foundational to prosperity - it is central to jobs and to poverty reduction.

Agrifood system transformation is central to national development, driving prosperity and improving lives-especially for the poor. The agrifood sector goes beyond farming, encompassing processing and distribution, and in Sri Lanka, it delivers 25% of GDP and employs 42% of the workforce. Growth in agriculture reduces poverty more than growth elsewhere in an economy. A one percent increase in Agricultural Gross Domestic Product (GDP) per worker yields double the reduction in extreme poverty as a comparable increase in labor productivity in industry or services. Boosting agricultural productivity drives higher incomes, creates non-farm jobs, and supports urbanization. In countries with growing rural populations, innovation in agriculture absorbs youth into the workforce and raises wages. As such, strategic investments and policies in agriculture are essential for accelerating poverty reduction and inclusive growth.

(2) Innovation is a key driver of agricultural growth.

Globally, over the past five decades there has been a major shift in agriculture from resource-led growth to productivity-led growth. Instead of using more land, water, or inputs, most growth in agriculture now comes from making better use of resources. Total Factor Productivity (TFP) - or the application of new ideas - is about using new technology and smarter ways of working to get more output from the same factors of production. From 2001 to 2015, improvements in TFP made up over two-thirds of global agricultural growth, and nearly 60% in developing countries.

A key driver of TFP is the invention, adaptation, and dissemination of new technologies to farmers and firms. Sustained agricultural productivity relies on farmers regularly adopting new practices and technologies to boost yields, use inputs efficiently, diversify crops, improve quality, and protect natural resources. Such innovations must suit local conditions and adapt as environments change. Strengthening national agricultural R&D is crucial, as local capacity helps to ensure that solutions are tailored. Barriers such as limited information, lack of insurance and capital, high costs, and policy biases can slow the spread of new technologies.

Government must lead the way by funding public agricultural R&D and by enabling private sector to invest in R&D and drive innovation. Investments in agricultural R&D deliver big returns. Across developing countries, social rates of return to agricultural R&D are over 40 percent per year. But because of significant “knowledge spillovers” from R&D, the incentives for private sector to invest in technology development is often dampened necessitating smart regulation to ensure that the private sector has the right incentives to invest in innovation.

In Sri Lanka, while TFP growth has supported agriculture’s contribution to poverty reduction and economic output, the efficiency gains have not been strong enough to sustain robust productivity growth comparable to regional peers. The drivers of Sri Lanka’s agricultural growth has shifted over time. From 1961-1980, expansion of farmland and irrigation drove growth. Between 1981-2000, increased use of inputs like fertilizers and improved crop varieties boosted output. More recently, since 2001 to today, TFP has dominated agricultural growth in Sri Lanka. But average annual TFP growth is still just 0.28%, far below the global average 0.74% and South Asian average 1.44%. To boost future growth, the country must tackle challenges in research, extension services, and input efficiency.

(3) Public investment in R&D and digitization, and policies to enable private sector R&D will drive competition and innovation in agriculture.

Sri Lanka's government spent an average of LKR 170 billion per year on agriculture and food from 2017 to 2022, focusing heavily on irrigation and fertilizer. Agricultural spending was on average about 7.6 percent of the total government budget, higher than Asian and global averages. Most agriculture spending went to irrigation, estimated at 89% of total support. Fertilizer subsidies dominated producer support, making up 67% of the producer support estimate and 80 - 90% of input subsidies - but these subsidies are regressive, inefficient, and hinder competitiveness.

Agricultural R&D spending in Sri Lanka rose in nominal terms since 2019 but fell in real terms after 2021. R&D remains a major part of the budget, with significant investment in technology transfer and extension. Seed research takes the largest share (about 30%), followed by extension services (20%), and then R&D on other field crops (15%). Despite the focus on seeds, certified seed requirements are not often met, and farmers use older seeds, leading to low replacement rates and slower productivity growth. Restrictive seed policies and costly permit procedures further hinder private sector investment and delay revised seed regulations.

More broadly, Sri Lanka's agricultural innovation system is fragmented, with weak coordination between public and private actors. Decentralization has weakened an already fragmented system, and its effectiveness will depend on collaboration around a shared vision. To drive economic growth, research and extension must shift from a supply-driven to a market-driven approach—focusing less on productivity and more on profitability, technology, and market opportunities.

Digitizing public systems is crucial for speeding up efficiency and innovation, and Sri Lanka's Government Agriculture Enterprise Architecture is a promising step forward. Despite ranking 95th in the UN e-Government Readiness Survey from 2022, most ministries engaged in agriculture and food ministries have embarked on some digital transformation. However, these efforts often lacked an integrated approach, resulting in siloed systems and major integration challenges. The Enterprise Architecture, a Whole-of-Government approach, aims to break down these barriers by considering all stakeholders and fostering cross-sector collaboration.

Innovation is taking off in Sri Lanka's Ag Tech sector, and the government must support a strong ecosystem so private innovators can keep driving progress. SenzAgro is one of 40+ Ag Techs leading the way, by building smart food systems powered by data, AI, and remote sensing-delivering real solutions for smallholders particularly in the lagging Northern Province. Their tech boosts pre-harvest productivity and slashes post-harvest waste, creating an efficient, end-to-end value chain. From soil-specific crop advice and precise input recommendations to real-time weather alerts and smart logistics, SenzAgro's platform empowers 14,500 farmers across 15 crops with yield forecasts, waste reduction, and transparent supply chains.

(4) Innovations should prioritize the *inclusion of smallholders, women, youth, and lagging regions to yield dividends for growth that secures the social fabric.*

Supporting innovations centered on the commercialization of agrifood smallholders is crucial, and there are promising models of success in Sri Lanka. The Agriculture Sector Modernization Project helped smallholder farmers become more competitive and market-focused through training, new technologies, and better infrastructure. The 72 Agriculture Technology Demonstration Parks were established and benefited nearly 40,000 farmers-including over 14,000 women-across 12 districts. These parks introduced new modern technologies for 13 crops, registered 65 new farmer companies, and increased agricultural sales by 44%.

Closing the gaps for women and youth is urgent for Sri Lanka's economic future. Boosting female labor force participation could raise GDP by up to 39%, yet female labor force participation rates have stalled at 31-35% for decades-far below those of men. Youth unemployment is alarmingly high at 28%, with many young people not in education, employment, or training. The country also faces significant out-migration and a workforce where 70% are in informal jobs, often with limited prospects, especially for women in low-wage sectors. Micro and small enterprises are key to creating productive opportunities, but growth is held back by weak business skills, restrictive social norms, poor access to finance, and fragmented institutional support at the local level. Tackling these barriers to the economic inclusion of women and youth is essential to unlock Sri Lanka's full potential through

Addressing the needs of the Northern and Eastern provinces is essential for inclusive growth. Sri Lanka's economic geography shows stark regional

disparities: the Western Province, highly urbanized, contributes 44% of national GDP, while the less industrialized Northern and Eastern Provinces account for only 4% and 5%, respectively. Decades of conflict have left these regions behind, with slow economic growth and low private sector participation. Agriculture and fisheries are the backbone of local economies, employing about 30% of the workforce and providing livelihoods for 65% of the population. The Eastern Province produces 25% of Sri Lanka's national paddy output, and the Northern Province has strong potential for high-value crops. Despite their importance, these regions have not received proportionally higher support. Public spending remains focused on infrastructure, with limited investment in market access, extension, or diversification. This highlights the need for transparent, data-driven resource allocation to address regional disparities and promote inclusive development.

(5) Innovation should *protect* natural resources to deliver growth that is sustainable and resilient.

A recent study of the Kala Oya and Yan Oya River Basins-two of Sri Lanka's most environmentally fragile and economically important regions-reveals alarming trends. Forest loss, expanding agriculture, and worsening land degradation are accelerating. By 2050, degraded land in Kala Oya is expected to jump from 18% to 29%, and in Yan Oya from 29% to 47%. Biomass productivity could drop by 35%, threatening food and fodder supplies. In small tank cascade catchments, land degradation is reducing water storage due to siltation from erosion. Deep-rooted issues like fragmented institutions, insecure land tenure, and limited stakeholder involvement undermine sustainable land management. Although climate-smart practices like agroforestry offer high returns (up to 63 LKR for every 1 LKR invested), adoption remains low (at about 20%) because of tenure insecurity, weak extension services, and limited financing.

Tackling biodiversity loss, climate change, food insecurity, and poverty would require more than the fragmented, sector-by-sector solutions. Integrated Landscape Management (ILM), based on joint decision-making, can connect social and economic development with conservation and climate goals, while managing trade-offs. Restoring traditional water systems like tank-cascades is key for Dry Zone resilience-these efforts, when combined with ILM, could increase rice yields by 35%, add \$9.7 billion to annual GDP, and cut human-wildlife conflict by 40%. To make ILM work, Sri Lanka needs to empower

Cascade Management Committees, align zoning and land tenure, streamline restoration using science-based investment prioritization, and expand climate-smart agriculture through adequate incentives.

Conclusion

In summary, unlocking innovations for inclusive and sustainable agricultural growth is vital for Sri Lanka's prosperity and poverty reduction. But realizing this potential requires overcoming challenges in productivity, research, and equity. There are some models of success around technology adoption and commercialization of smallholders, and scaling these models will be key. Gaps remain in supporting women, youth, and lagging regions, as well as in protecting natural resources from ongoing degradation. To secure a resilient and competitive agrifood system, Sri Lanka must intensify investments in research and development, foster public-private coordination, embrace the digital transformation, and ensure that innovation benefits all segments of society. Now is the time to build a future where agriculture drives broad-based growth and lasting social and environmental well-being.

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Panel Discussion “From Margins to Mainstream: Agriculture, Innovation, and Economic Growth”

Panelists:

1. Prof. Jeevika Weerahewa, Professor of Agricultural Economics, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya
2. Dr. Rajendra Adhikari, Senior Lecturer in Agribusiness, School of Agriculture and Food Sustainability, The University of Queensland
3. Dr. Athula Senaratne, Senior Agriculture Specialist, World Bank
4. Dr. Vipula Wickramarachchi, Additional Director, Economic Research Department, Central Bank of Sri Lanka

Moderator: Dr. Asanka Wijesinghe, Research Fellow, Institute of Policy Studies of Sri Lanka

Background & Rationale:

Is there a role for agriculture in economic growth?¹ Although the agriculture sector was regarded as a backward and stagnant industry with limited growth potential, as in Lewis two-sector model², a recent body of literature shows the positive impact of agricultural productivity on economic growth. A positive link between technological advancements, such as the adoption of high-yield varieties, and macroeconomic growth is causally established.³ An unfinished structural transformation, stagnant macroeconomic growth, and climate change incentivise Sri Lanka to reimagine the role of agriculture in economic development.

Labour productivity in the agricultural sector in Sri Lanka remains low, with about a quarter of the labour force employed, yet it contributes 7.5% to the

¹ The direction of the effect of agricultural productivity depends on whether economies are closed or open. See: Matsuyama, K. (1992). Agricultural productivity, comparative advantage, and economic growth. *Journal of Economic Theory*, 58(2), 317-334.

² Lewis, W. A., 1951. Principles of economic planning.

³ Gollin, D., Hansen, C. W., & Wingender, A. M. (2021). Two blades of grass: The impact of the green revolution. *Journal of Political Economy*, 129(8), 2344-2384.

GDP in 2024.⁴ Improving productivity in agriculture is essential for the much-needed structural transformation. The sector entraps resources, including labour, water, and land, mainly in water-intensive and less productive crops. Climate change is expected to reduce rice yield. Evidence shows that climate change has decreased the average yield by 0.20% to 4.99% in the *Yala* season.⁵ Water usage for rice cultivation in Sri Lanka ranges from 1,200 to 1,800 mm, with a water productivity of only 0.7 kg/m³.^{6,7} While labour mobilisation away from agriculture is necessary for long-term economic growth, the efficient utilisation of water and land in farming is crucial for the sector's sustainability.

Although sector-specific policy measures are essential for transforming agriculture, broader reforms such as land policies, tariff policies, and increasing resource use efficiency are also necessary to enhance agriculture's role in Sri Lanka's economy. Distortionary price supports, subsidies, land-use restrictions, and trade policies continue to prop up an unproductive agricultural sector. In 2024, Sri Lanka allocated 0.6% of its government revenue to agrarian support programmes, with 90% of that funding going to fertiliser subsidies.⁸ There are restrictions on land ownership, and market-oriented land reforms have been halted. These policies keep labour and land resources within the agricultural sector while reducing its resilience to growing challenges from climate change. Therefore, a dual policy goal exists: to induce structural transformation through broad policy changes and to improve sector productivity through innovation, research and development, and technology adoption.

⁴ According to the Labour Force Survey data, in the last quarter of 2024, 26.8% of the labour force was employed in the agriculture sector. In the second quarter of 2025, it was 25.7%.

⁵ Estimates vary by the model type. See: Karunaratne, A.S., Chaogejilatu & Iizumi, T. A climate impact attribution of historical rice yields in Sri Lanka using three crop models. *Sci Rep* **15**, 15360 (2025). <https://doi.org/10.1038/s41598-025-00262-5>

⁶ Salman, M., et al. (2023). The status of water use efficiency and productivity with a focus on paddy rice in Sri Lanka. Rome: FAO. <https://doi.org/10.4060/cc5097e>

⁷ The water productivity of rice is higher than in countries like Vietnam and Thailand in Sri Lanka. However, China and Bangladesh have higher water productivity. In Areas like Nanchang, China, water productivity is 1.84 kg/m³, while in Punjab, India, it is 1.37-1.17 kg/m³. See Foley, D. J., Thenkabail, P. S., Anece, I. P., Teluguntla, P. G., & Oliphant, A. J. (2020). A meta-analysis of global crop water productivity of three leading world crops (wheat, corn, and rice) in the irrigated areas over three decades. *International Journal of Digital Earth*, *13*(8), 939–975. <https://doi.org/10.1080/17538947.2019.1651912>

⁸ Calculated using data from the Ministry of Finance. The estimated revenue for 2024 was LKR 4,127 Bn, while the allocation for fertiliser subsidy was LKR 23 Bn.

Agricultural innovations, climate-smart technologies, and artificial intelligence can enhance labour productivity in farming, freeing up a significant portion of the workforce for other industries and services. Emerging technologies and greater computing power enable the analysis of large data sets, helping farmers make informed decisions, optimise inputs, and reduce risks. However, Sri Lanka must establish the foundations for widespread technology adoption by investing in research and development, modernising data collection-including weather data-and developing data centres. Effective agriculture extension programs are also necessary to bridge the gap between innovation and adoption. Given that allocating additional funds is not realistic due to the current limited fiscal space, Sri Lanka will need to repurpose the allocated funds to new areas by increasing the efficiency of expenditure and targeting.

Panel Objectives:

1. To examine the role of agricultural productivity in driving economic growth and structural transformation in Sri Lanka.
2. To evaluate the challenges and opportunities in enhancing resource efficiency and climate resilience within the agricultural sector.
3. To identify policy reforms and innovations necessary for repositioning agriculture as a catalyst for sustainable development in Sri Lanka.

Invited Speech

Agricultural landscapes for biodiversity conservation: Piloting Other Effective Area-based Conservation Measures (OECMs) in Sri Lanka

J.P.J Manamperi, S.A.S.J Senanayake, S de A. Goonatilake, S.J Perera
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Sri Lanka, together with India's Western Ghats, delimits a global biodiversity hotspot for their exceptional species richness, endemism, and increasing threats to their natural habitats. Although with numerous conservation initiatives, Sri Lanka continues to face pressures from development, habitat loss, and climate change. Although 29% of its land is protected, many critical habitats harbouring threatened and endemic species lie outside and remain unprotected. To meet Target 3 of the Kunming–Montreal Global Biodiversity Framework (conserving 30% of land globally by 2030), Sri Lanka can make a significant contribution by conservation beyond Protected Areas (PAs). Given limited land availability and competing development needs that impair PA expansion, the country must integrate Other Effective Area-based Conservation Measures (OECMs) into its national conservation strategy. State or privately managed areas that support endemic or threatened biodiversity, including plantations, tourism sites, and lands with cultural, spiritual, or religious significance carry the potential for OECMs, upon long term conservation commitments. Among these, the plantation sector plays a major role, harbouring a significant biodiversity across approximately 20% of Sri Lanka's wet zone. Here we assess the Halgolla Estate, managed by Kelani Valley Plantations PLC in Kegalle District, against IUCN's eight OECM criteria, to be recognised as the first privately managed Conserved Area. Covering 1,196 ha outside the PA network, it supports a rich diversity of flora and fauna respectively with 329 species (34% endemics; 29% threatened) and 413 species (37% endemics as well as threatened) respectively. With clear boundaries, long-standing sustainability practices, and a comprehensive estate management plan, Halgolla stands strong as a potential OECM. Free, Prior and Informed Consent (FPIC) is being secured from relevant stakeholders, to position the estate as a candidate OECM. Once OECMs are formally integrated into Sri Lanka's national conservation strategies, Halgolla can be reported to the World Database on OECMs (WD-OECM) under the Protected Planet Database (UNEP-WCMC). Such global recognition would bring

tangible benefits to the estate and highlight its role as a production landscape delivering globally significant biodiversity outcomes.

Keywords: Conserved Areas, Sustainability, Plantation, 30x30 Target

ARF Contributory Paper Session

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Perceptions of Coconut Growers on the Impacts of Climate Change Dimensions on the Coconut Industry in Sri Lanka: Evidence from the Coconut Triangle

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Climate change is severely affecting global food production and food security, with Sri Lanka's coconut sector particularly vulnerable, leading to income and well-being losses for grower communities. Addressing these impacts requires scientific assessments of farmers' perceptions and adaptation strategies, which are crucial for informed decision-making. In this context, this study was focused to identify the coconut growers' perceptions on impacts of climate change dimensions in the coconut triangle of Sri Lanka [i.e. Kurunegala (KUR), Gampaha (GAM), and Puttalam (PUT) districts]. It adopted a stratified, multi-stage sampling design following the Lemeshow and Levy Method to select 400 households involved with growing coconut (KUR=160; GAM=100; PUT=140). The pre-piloted semi-structured questionnaire-based personal interviews were carried out to elicit information related to socio-demographic characteristics and growers' perceptions on a Likert-scale. The outcome of analysis show that the growers from KUR, GAM and PUT (respectively with percentages) had perceived "Climate change influences agricultural yields negatively (82, 85, 77)"; "Climate change poses threats to food security" (83, 81, 76)", and "Climate change is really happening (88, 86, 85)". Yet, the levels of perceptions were 'very low' with respect to "Climate change has no any serious cause for economic depression to our country (14, 21, 06)". Further, the growers from GAM had highly perceived (>80%) with regard to "Decline in coconut yield during last 5-10 years; Yellowing and drooping of more number of coconut fronds during dry periods; Wilting and drying of more number of coconut fronds during dry periods; Falling of more number of button nuts during dry periods over the last 5 years; Lowering of the ground water level over the last 5-10 years, and Any increase of pest and disease infestations on coconut during last 5 years due to climate change" compared other two districts. Spearman's Rank-order Correlation Coefficients were calculated to examine the relationships between coconut growers' perceptions and several explanatory variables, including Age, Landholding size, Education, Farming experience, Land ownership, and Agricultural extension contact. Results show that the education level and agriculture extension contact were positively and significantly related with growers' perceptions in KUR and PUT, except GAM, and farming experience was also positively and significantly correlated with the growers' perceptions in KUR and GAM districts at 5% significance level. Outcome of the analysis suggests, overall, that the growers in KUR and PUT have 'lower perceptions' on impacts of climate change compared GAM, which disclose the importance of creating grower-oriented extension and awareness campaigns targeting capacity development of growers about the risks and uncertainties associated with different climate change scenarios.

Keywords: Adaptations; Awareness campaigns; Climate change; Coconut industry in Sri Lanka; Coconut grower perceptions

Economic and Welfare Implications of Rice Market Reforms in Sri Lanka: A CGE Analysis of Productivity, Trade and Price Policies

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Rice plays a pivotal role in Sri Lanka's food system, providing nearly 45% of national calorie intake and supporting the livelihoods of more than 1.8 million farmers. Although the country has achieved near self-sufficiency, periodic price volatility, seasonal supply shortages, and inconsistent policy measures continue to disrupt market stability. Recent challenges including fertilizer policy disruptions, adverse weather conditions, and administrative interventions such as Maximum Retail Price (MRP) controls and import restrictions have intensified concerns over food security and economic resilience. This study evaluates the macroeconomic and welfare effects of alternative rice market interventions in Sri Lanka, focusing on the individual and combined impacts of paddy productivity improvement, rice import quota expansion, and MRP reduction. A Computable General Equilibrium (CGE) framework was employed using the Global Trade Analysis Project (GTAP 10) model to capture direct and indirect transmission effects across sectors and institutions. The GTAP database was aggregated into ten regions, ten sectors, and five production factors to simulate four policy scenarios: (1) a Rice Mix Policy (RMM) combining a 10% increase in paddy productivity, a 10% expansion of rice import quotas, and a 10% MRP reduction; (2) a Rice Productivity Policy (RMP) focusing solely on productivity growth; (3) a Rice Ceiling Price Policy (RMC) applying only an MRP reduction; and (4) a Rice Market Import Policy (RMI) emphasizing import license expansion. Simulation results reveal that all interventions generate positive macroeconomic effects, though with differing magnitudes. The RMM scenario yields the highest gains, raising GDP by US\$ 390.59 million and aggregate welfare by US\$ 403.03 million. Productivity enhancement alone (RMP) also produces significant welfare gains (US\$ 147.95 million), underscoring the centrality of supply side efficiency. Welfare decomposition indicates that technical efficiency, allocative efficiency, and endowment effects are key contributors to overall welfare improvements. The findings align with international evidence that integrated policy packages combining productivity growth with moderate trade and price interventions yield the most sustainable and equitable outcomes. The study concludes that a coordinated policy mix linking paddy productivity enhancement, selective import liberalization, and time-bound price regulation offers the most effective path toward stable, inclusive, and resilient rice market development in Sri Lanka.

Keywords: GTAP, Import quota, Liberalization, Maximum Retail Price, Sri Lanka

Economic Evaluation of the Private Costs of Chronic Kidney Disease in Medawachchiya, Sri Lanka: A Cost of Illness Approach

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Over the past two decades, Chronic Kidney Disease of Unknown etiology (CKD) has emerged as a significant health problem in dry zone Sri Lanka. Despite substantial socioeconomic impact, few studies have quantified the financial burden on patients. This study primarily aimed to estimate the private cost for CKD patients using cost of illness approach (COI) while exploring their socio-demographic characteristics and calculating the disease burden using Disability Adjusted Life Years (DALYs) and Quality Adjusted Life Years (QALYs). A cross-sectional survey was conducted at *Medawachchiya* Base Hospital, from November 2021 to February 2022 enrolling 50 CKD patients (excluding transplant recipients). The questionnaire captured both direct and indirect costs such as inpatient and outpatient visits, dialysis, diagnostics, clinic visits, purchasing drugs, consultation, monthly income, drinking water, special diets, and house modifications. Each cost component was calculated by considering private expenditures with mean values expressed in LKR per month. The results indicated that the mean monthly direct cost was LKR 8,491 and mean indirect cost was LKR 6,580 with total house expenditure per patient averaged LKR 11,987 with dialysis representing the single largest cost component. The mean age of a patient was 67±11 years; men were diagnosed slightly earlier (57±9) than women (59±8). Among male patients 75% were farmers and 25% were labourers while 91% of females were unemployed and 9% were farmers. Monthly household income declined significantly after diagnosis from LKR 30,800±2648 to LKR 24,220±3167. Regarding medical care, 80% of patients required inpatient treatment, 100% attended clinics, 74% had OPD visits, 42% were recommended for dialysis, 14% were undergoing dialysis, 44% used private diagnostics, 14% sought private consultations, 88% received CKD allowance, and 90% consuming purified drinking water. The average DALY was 32.85 for deceased patients, and 22.8 for living (life expectancy=75years & disability weight=0.571) with a Quality Adjusted Life Expectancy of 4 years. This study highlights a considerable private financial burden on CKD households in *Medawachchiya* with dialysis as the main primary cost driver. The decline in household income, high unemployment among women and dependence on farming underscore the vulnerability of rural livelihoods. These findings emphasized the importance of preventive strategies and long-term policy interventions rather managing complications in isolation.

Keywords: Burden of Disease, Health economics, Household expenditure, Quality of life, Rural health

Enhancing Home Garden Coconut Production and its Implications for Coconut Kernel - Based Industries in Sri Lanka

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Coconut is a major plantation crop in Sri Lanka, supporting the livelihoods of many and contributing significantly to national food security after rice. However, fluctuations in domestic production have created challenges for household consumption and the coconut-based industry. This study aimed to identify strategies to enhance coconut production in home gardens, assess factors influencing productivity, estimate yield variability, and examine its impact on the coconut-based industry. Primary data were collected through two questionnaire surveys: one administered for the fifty-coconut kernel-based industries registered with Coconut Development Authority, and another to 384 households with home gardens of less than 40 perches located in the Gampaha, Kurunegala, and Puttalam districts. Data was analyzed using SPSS. The results revealed that small home gardens in Puttalam showed a high potential for expanding coconut cultivation. Tall coconut varieties dominated, and many trees over 30 years old were found to be low yielding. Opportunities were also identified for utilizing vacant spaces within gardens to increase production. Key challenges included pest and disease damage, limited access to quality seedlings, poor water management, and inadequate knowledge of fertilizer application. Additionally, high quality fertilizers and plant protection materials were often not available in sufficient quantities. The study highlights the importance of training programs, workshops, and media campaigns to strengthen garden management practices. Enhancing linkages between suppliers and farmers and ensuring access to quality inputs at affordable prices are essential for sustainable production. Addressing these constraints along with promoting value-added coconut products can increase national production and support the coconut-based industry. The study further outlines major limitations and proposes strategies for improving productivity and long-term sustainability.

Keywords: Climatic variations, Coconut-based industry, Household consumption, National production, Yield variability.

Spice Tourism and Sustainable Livelihood Development: Evidence from Spice Gardens in Matale, Sri Lanka

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Spice tourism represents a significant agritourism sub-sector with considerable potential to enhance rural livelihoods in Sri Lanka. This study examines the development of spice gardens as tourism destinations and evaluates their contribution to income diversification and livelihood improvement among farming communities. The Matale district- well known for its spice cultivation, agricultural heritage and tourism activities- was selected as the primary research area. A mixed method approach was employed, incorporating structured questionnaire surveys, key informant interviews, focus group discussions, and case studies. Data were collected from purposively selected 42 spice garden owners and operators purposively selected by insights from non-tourism farmers and tourist visitors. Geographic Information System mapping and participatory rural appraisal tools were used to identify opportunities and constraints. The findings reveal that spice gardens have successfully diversified traditional agriculture into profitable tourism enterprises. Most respondents (73%) have been engaged in agritourism for over five years, and 45% earn monthly incomes exceeding Rs. 200,000. The gardens attract more than 100 tourists per month primarily from China (25%), Germany (20%), and France (18%), with 91% registered under Sri Lanka Tourist Board. Core activities include farm tours and farmers' markets/stalls (96%), supported by multilingual tour guides (72%). However, key challenges persist, including regulatory barriers (32%), financial constraints (29%), and marketing difficulties (18%). Tourist dissatisfaction is mainly to high product prices (65%) and transport limitations (22%). Notably 64% of farmers not currently engaged in tourism express willingness to participate, if provided with training and support. Overall, the study demonstrates that spice tourism generates significant income, creates employment, and strengthens community linkages through supply networks. Targeted interventions such as financial assistance, policy support, infrastructure improvement and capacity building can further accelerate growth in this sector and promote inclusive, sustainable livelihood for rural farming communities.

Keywords: Agricultural diversification, Agritourism, Rural livelihoods, Spice gardens, Sustainable development.

Community-driven Carbon Trading: Rubber Cultivation as a Climate Solution in Sri Lanka

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Carbon trading serves as a financial mechanism that enables organizations to offset their greenhouse gas (GHG) emissions by supporting other entities in reducing GHG emissions. Rubber trees, recognized for their long-term carbon sequestration capacity, are classified under plantation forestry. As such, new rubber plantations are eligible for carbon trading within the Afforestation, Reforestation, and Revegetation category, provided they meet key requirements of additionality and sustainability. Importantly, community participation plays a central role in these initiatives, offering added benefits to smallholder rubber farmers. Under the Smallholder Tea and Rubber Revitalization Project and the Rubber Development Department of Sri Lanka, around 3,000 hectares of degraded land in the Uva and Eastern Provinces were newly planted with rubber between 2017 and 2021, involving nearly 5,000 smallholders. These plantations underpin a voluntary carbon market initiative jointly advanced by the Rubber Research Institute of Sri Lanka and Proclime Lanka (Pvt) Ltd., acting as project proponents. The Project Description Document has been submitted, and the project is now listed in the Verra Registry. Further, validation report has been submitted by an accredited third-party auditor for formal project registration. The first verification cycle is planned for 2026, with the expectation of utilizing a part of the verified carbon credits to offset the carbon footprint of rubber-related government institutions, aligning with Sri Lanka's Nationally Determined Contributions (NDCs) toward Net Zero. The remaining credits will be traded according to market demand, with revenues directed toward improving the livelihoods of rubber smallholders within the project area and supporting the expansion of rubber cultivation in nontraditional regions of the country. The project is expected to achieve a total emission reduction of 1.83 million tCO_{2e}, averaging approximately 46,000 tCO_{2e} annually. Key lessons and critical considerations emerging from this initiative highlight the potential of rubber cultivation as a foundation for future carbon trading projects.

Keywords: Carbon in setting, Community benefits, Rubber smallholders

Leveraging Circular Agricultural Transformation in Sri Lanka through SEEA-based Natural Capital Assessment and Planning

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Sri Lanka's economy is deeply dependent on natural capital, particularly through its agriculture sector, which relies on healthy soils, functioning watersheds, biodiversity, and healthy atmosphere. However, the value of these natural assets has historically been excluded from the conventional System of National Accounts (SNA) and agricultural planning, limiting the ability of policymakers to recognize ecosystem contributions to productivity, resilience, and long-term growth. The System of Environmental-Economic Accounting (SEEA) offers a globally accepted statistical accounting framework to integrate natural capital into economic decision-making by linking environmental assets with economic accounts. Although implementation of SEEA in Sri Lanka is still at an early but steadily advancing stage, national institutions and policymakers are increasingly recognizing its importance for policy coherence, green economic transition, circular economy and climate-resilient inclusive development. This study examines how SEEA-Ecosystem Accounting can be incorporated into Sri Lanka's national agricultural planning to strengthen evidence-based policies and promote more sustainable resource use. SEEA supports decision-making at multiple governance levels by assigning measurable values to ecosystem stocks and flows such as water regulation, soil fertility, pollination and carbon storage. SEEA helps measure the true value and cost of natural resources, enabling policymakers to understand how farming practices impact ecosystems. For example, SEEA can highlight the benefits of organic farming, while also revealing the hidden damage costs of chemical-intensive agriculture and unsustainable land use. SEEA also captures the value of biodiversity supported by extensive cultivation systems and home gardens, which enhance resilience to climate and market shocks. Through such integrated insights and accurate ecosystem valuation, SEEA supports sustainability-focused agricultural policies to guide efficient resource allocation shaping production choices, consumption patterns, and investment priorities while making interlinkages across the economy visible. The framework also highlights opportunities to use nature-based instruments such as Payments for Ecosystem Services (PES), enabling farmer communities and landholders to be rewarded for conserving critical natural capital that benefits multiple sectors. Failure to account for natural capital results in distorted price signals, hidden environmental liabilities, and long-term economic losses. By demonstrating the economic value of ecosystems, SEEA can support the design of incentives for circular agriculture, sustainable land management, and climate-smart investments in the agriculture sector.

Keywords: Agricultural governance, Ecosystem services, Natural Capital Accounting, SEEA

Postgraduate Research Competition

Coordinator of the Postgraduate Research Competition

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Evaluation Panel of the Postgraduate Research Competition

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Prof. Thilak Mallawaarachchi, Honorary Associate Professor, The University of Queensland, Australia

Dr Rajendra Adhikari, Senior Lecturer, The University of Queensland, Australia.

Enhancing the Performance of Agricultural R&D Institutes: Strategic Use of KPIs to Create a Sustainable Agri-Food Innovation Ecosystem in Sri Lanka

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Building a resilient and sustainable agri-food sector is central to Sri Lanka's economic recovery, and the performance of its agricultural research and development (R&D) institutes plays a pivotal role in this transformation. However, existing performance measurement approaches in these institutes rely largely on narrow, output-focused metrics that fail to capture the broader value of innovation, collaboration, technology integration, and long-term societal impact. This study examines how strategically designed Key Performance Indicators (KPIs), supported by Key Performance Drivers (KPDs), can enhance the performance of agricultural R&D institutes and contribute to a sustainable agri-food innovation ecosystem in Sri Lanka. Adopting a mixed-method design, the study first conducted a systematic review of global KPI frameworks relevant to R&D management, followed by in-depth interviews with 32 senior administrators and research leaders from major agricultural research institutes. Thematic Analysis using MAXQDA identified five core dimensions of R&D performance: research commercialization, research collaboration, research for society, institutional management, and technology-integrated systems. These themes highlight persistent gaps in Sri Lanka's current performance management systems, including fragmented KPI practices, weak digitalization, and misalignment between organizational priorities and stakeholder expectations. The study proposes several practically applicable models: an Integrated Performance Management Model for commercial agriculture, a virtual KPI-driven performance management system, a "smart lab bubble" concept for connected research, and a KPI Index for benchmarking institutional performance. A key insight is that commercialization and collaboration must be treated as interdependent KPIs, as improving one without strengthening the other limits innovation outcomes in resource-constrained environments. Policy implications are substantial. Strategic KPI governance can strengthen resource allocation, improve industry linkages, accelerate commercialization, and enhance contributions to national food security. The frameworks presented offer a harmonized pathway for modernizing performance management across institutes and advancing Sri Lanka's transition toward a more sustainable, innovation-driven agri-food system.

Keywords: Agriculture Research, Commercial Agriculture, Key Performance Indicators, Performance Management System, Sustainable Agri-Food Systems

Understanding Climate Change Adaptation Behaviour and Adaptive Capacities of Dairy Farmers in Sri Lanka's Dry-Zone Cascades

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Dairy farming is highly vulnerable to climatic variations due to its strong dependence on natural resources. Despite this sensitivity, dairy farming has received comparatively limited attention within climate change research, particularly in smallholder production contexts. This study addresses this gap by examining how resource-poor dairy farmers in Sri Lanka's dry-zone tank cascade systems respond to climate change (CC), while also highlighting the potential role of common-pool resources in reducing their vulnerability. The research investigates farmers' perceptions of CC, their adaptive capacities (AC), the extent to which feasible adaptation measures are adopted, and the key socio-economic and institutional determinants shaping adaptation decisions. Understanding farmers' responses to both short- and long-term climatic variations is crucial for designing robust and context-specific interventions that enhance system-level climate resilience. Data were collected from the *Siwalakulama* and *Thirappane* cascade systems, where dairy farming constitutes a primary livelihood activity. A sample of 200 dairy farmers was randomly selected, and information was gathered using pre-tested structured questionnaires. Levels of CC adaptation and AC were quantified using the Activity-based Adaptation Index (AAI) and the Adaptive Capacity Index (ACI). Determinants of adaptation behaviour were analysed using an ordered logistic regression model. Farmers commonly perceived reductions in milk yield, growth retardation of animals, and shortages of pasture and water as the most significant impacts of CC. Most respondents adopted low-cost adaptation strategies requiring minimal technical knowledge or financial investment. Gender, dependency ratio, access to credit, access to extension services, and perceptions of CC impacts significantly influenced adaptation levels, while AC moderated the relationship between climate perceptions and adaptation behaviour. Overall, the findings underscore the need for targeted interventions that strengthen linkages between dairy and other production systems, improve access to social and financial capital, and support the development of integrated climate-resilient strategies for smallholder dairy farmers in dry-zone cascade systems.

Keywords: Adaptation index, Adaptive capacity, Cascade system, Dairy farmers, Smallholders

Consumer Preferences and Willingness to Pay for Dried Fish in Galle District of Sri Lanka

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The dried fish industry serves as an essential livelihood strategy for coastal fishing communities in Sri Lanka, particularly during periods of low or zero catch. At the national level, dried fish also plays a significant role in household food consumption, accounting for approximately 4% of the average monthly food expenditure. However, local dried fish producers claim that they face challenges in marketing products and receive a low price. A key gap identified in the literature is the limited consumer analysis for dried fish market and how their preferences influence product quality, marketability, and value chain performance. This study aimed to estimate consumers' willingness to pay (WTP) for key attributes considered when purchasing dried fish. The findings were further used to generate recommendations to upgrade the dried fish value chain. The study incorporated a consumer survey of 180 households; 60 households from each representing urban, rural and estate sectors in Galle district of Sri Lanka. A choice experimental approach was utilized, followed by questions on consumer preference and knowledge related to dried fish. Ten dried fish producers were also interviewed using semi-structured questionnaires and informal interviews. Results revealed that the smell and appearance were the most considered organoleptic properties by consumers. Consumer knowledge on quality and nutrition was notably low; only 11% of the total sample aware about the shelf life of high-quality dried fish and 22% recognized dried fish as a comparatively rich protein source in Sri Lanka. Choice experiment revealed that consumers prefer locally produced, sun-dried and quality-certified dried fish. And the urban and rural consumers willing to pay a premium of 374.21 and 325.89 Sri Lankan Rupees, respectively for 100 g of quality-certified dried fish. The results of the value chain analysis revealed that 70% of producers sell their products to the wholesalers who visit to the processing site, limiting the flow of market information to producers. Based on consumer insights, study recommends encouraging producers to obtain quality certifications by facilitating them with knowledge and technical assistance to enhance the value chain performance.

Keywords: Choice experiment, quality certifications, value chain

Management of Marine Recreational Resources and Trade-offs: Case Study of Hikkaduwa, Pigeon Island National Parks and Bar Reef Kalpitiya.

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Hikkaduwa National Park (HNP), Pigeon Island National Park (PINP), and Bar Reef Marine Sanctuary (BRMS) are three coral-rich Marine Protected Areas (MPAs) in Sri Lanka that provide diverse ecosystem services. Many ecosystem services are public goods, making them prone to free-riding at different levels. A major challenge is the trade-off between provisioning and cultural services. Overcrowded beaches, illegal fishing practices, and accumulation of non-biodegradable garbage are other common problems. Main objective of this study is to address the problem of managing common resources with trade-offs in these ecosystems and to examine how ecosystem service valuation can inform MPA management. Visitor Carrying Capacity (VCC) has also been estimated to identify the optimal visitor numbers. The Choice Experiment Method (CEM) was applied to calculate Marginal Willingness to Pay (MWTP) values. Attributes were identified through Focus Group Discussions (FGD) and Key Informant Interviews (KII), followed by surveys of 200 visitors at each site. VCC was estimated using a normative approach. Results show that in HNP, total MWTP is LKR 1266.62, with an extrapolated annual value of LKR 22.1million and an estimated VCC of 20 visitors. In BRMS, MWTP is LKR 1127.22, with an extrapolated value of LKR 8.6 million. In PINP, MWTP is LKR 1530.33, with an extrapolated value of LKR 76.6 million and a VCC of 31 visitors. Plastic pollution is a pressing issue, and a refundable deposit system is proposed. In HNP, the deposit should be LKR 343.47, reflecting MWTP for a clean beach. In BRMS, it should be LKR 549.19, corresponding to MWTP for a 50% reduction in plastic pollution. In PINP, the deposit should be LKR 564.55, also linked to a 50% reduction. To address illegal fishing gear, fishermen at PINP could be charged LKR 568.35 annually in addition to boat insurance premiums, reflecting MWTP for a 50% reduction in illegal nets. This study demonstrates that ecosystem service valuation and VCC estimates provide practical tools for designing policies to balance trade-offs and ensure sustainable management of Sri Lanka's MPAs.

Keywords: Marine Protected Areas, Choice Experiment Method, Public goods, Willingness to Pay.

Merit Certificates for Postgraduate Research Competition

MPhil/PhD thesis category: Dr. P. C. Abeysiriwardana, Director, Ministry of Science and Technology, Sri Lanka.

Master's thesis category: R.D.A.K. Ranasinghe, PhD Candidate, Deakin University Australia.

Undergraduate Research Competition

Coordinator of the Undergraduate Research Competition

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Evaluation Panel of the Undergraduate Research Competition

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Dr. Montse Costa Font, Senior Lecturer, Rural Economy Environment and Society, Rural Development & Food Marketing, Food Security Challenge Centre, Scotland's Rural College.

Dr. Shashika D. Rathnayaka, Lecturer, the Natural Resources Institute (NRI), University of Greenwich, UK.

Abstracts of the Undergraduate Research Competition (Oral Session)

Remittances, Intrahousehold Decision Making and Food Security in Sri Lanka

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Food insecurity remains one of the most pressing challenges in developing countries, underscoring the need for rigorous research to strengthen food security. This study investigates the impact of migrant remittances and intrahousehold decision-making on food security in Sri Lanka, using data from the Household Income and Expenditure Survey (2019). To address endogeneity bias, Propensity Score Matching technique was employed, complemented by Probit and Multiple Linear Regression models to validate results and enhance accuracy. Food security (access) was measured through a nutrition-based approach, using daily per capita calorie intake relative to the recommended dietary requirement of 2,030 kcal per person per day, and assessed via the Food Security Index (FSI). The findings reveal no significant relationship between total remittance-receiving households and food security, nor between households receiving internal remittances and food security. However, a significant negative relationship was observed between international remittance-receiving households and food security. This outcome may reflect remittance use patterns, with higher allocations to investment, housing, health, and education, and relatively lower spending on food, alongside limited attention to nutritional quality and increased consumption of processed or junk foods. Furthermore, no significant gender-based differences were found in the relationship between remittance receipt and food security. These results provide important insights for policymakers, highlighting the complex interplay between remittances, household decision-making, and food security, and pointing to the need for targeted interventions to mitigate food insecurity in Sri Lanka.

Keywords: Food security, Intrahousehold decision making, Propensity score matching technique, Remittances, Sri Lanka

Evaluating the Economic Effects of a Uniform Tariff on Rice Imports in Sri Lanka: A Partial Equilibrium Analysis

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Frequent and unpredictable policy shifts have become the norm in many agricultural markets in Sri Lanka. These discourage investment and limit growth potential and expansion of the sector. Against this backdrop, the present study seeks to assess the economic effects of rice import liberalization through a uniform ad valorem tariff. It documents the existing framework of price controls and various trade policies, and employs a partial equilibrium model to simulate the effects of a uniform tariff at three different rates (0%, 15%, and 25%). A series of calibrated models was developed to capture market equilibria over the period from April 2020 to December 2024, taking into account diverse policy instruments, including Maximum Retail Price (MRP) regulations on rice, Guaranteed Prices (GP) for paddy, the Special Commodity Levy (SCL) on imports, temporary import suspensions, and Import Control Licenses. The simulation results indicate that implementing a uniform tariff of 15% reduces retail prices by 4.48%, thereby benefiting consumers, and enhances social welfare by 1.54% compared to the business-as-usual (BAU) scenario. This social welfare gain is driven by both higher consumer surplus and increased government revenue. Even though a 0% tariff increases social welfare by 1.68%, it leads to a sharp decline in farm-gate prices of paddy, rendering cultivation unprofitable across most rain-fed districts and threatening the sustainability of smallholder farming. In contrast, 25% tariff safeguards producer incomes but delivers the lowest overall welfare gains due to higher consumer prices. By comparison, a 15% tariff leads to a moderate reduction in farm-gate prices of 18.65%, while sustaining profitability across nearly all irrigated areas and most rain-fed regions. This outcome represents a more balanced compromise among the interests of farmers, consumers, and the government. This study recommends a uniform tariff of 15% in place of multiple distortionary measures in rice and paddy markets in Sri Lanka as the first step in a reform process.

Keywords: Government revenue, Policy simulation, Price control mechanisms, Social welfare, Trade policy

Environmental and Economic Trade-Offs of Smallholder Dairy Feeding Strategies in Sri Lanka: An LCA-LCC Approach

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The dairy sector in Sri Lanka plays a crucial role in meeting nutritional needs, with smallholder farmers contributing significantly to national milk production. However, this sector is also a considerable source of greenhouse gas (GHG) emissions, making the identification of sustainable feeding strategies essential for enhancing productivity and climate resilience. This study applies a Life Cycle Assessment (LCA) alongside Life Cycle Costing (LCC) to evaluate the environmental and economic implications of two semi-intensive feeding strategies employed by smallholders in the North Western Province, which accounts for approximately 18–22% of the country's milk output. Feeding Strategy 1 (FS1) includes cultivated Guinea grass, coconut poonac, and commercial cattle feed, while Feeding Strategy 2 (FS2) relies on natural pasture grazing supplemented with commercial feed. A cradle-to-gate approach was adopted, with 10 Liters of raw cow milk as the functional unit. Results show that FS2 generates 474.13 kg CO₂ eq. per 10 Liters of milk, nearly four times higher than FS1 at 120.62 kg CO₂ eq. Additionally, FS2 exhibits higher ammonia volatilization and nitrate leaching, increasing eutrophication potential. Economic assessment indicates that FS2 incurs substantially greater emission-related costs compared to FS1. These differences are largely driven by variations in feed composition, nutrient utilization efficiency, and manure management practices. The findings emphasize that optimized feed use, cultivation of high-quality fodder, and improved manure and land management can reduce both emissions and production costs in smallholder systems. Although FS1 demands more input resources, it demonstrates superior environmental performance and aligns more effectively with climate-smart agriculture principles. By integrating environmental and economic perspectives, this study underscores the need to evaluate feeding strategies not only for milk output but also for their broader sustainability implications. The results offer practical guidance for policymakers and extension officers to promote low-emission, cost-effective feeding systems, supporting Sri Lanka's transition toward a more climate-resilient dairy sector.

Keywords: Climate resilience, Dairy sustainability, Emission cost analysis, Nutrient utilisation, Smallholder systems

**Impact of Human Wildlife Conflict on Farmer Households:
A Study in the North Central Province of Sri Lanka**
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Human-Wildlife Conflict (HWC) refers to the adverse interaction between humans and wildlife which is an escalating burden to the farmer community and wildlife conservation in Sri Lanka. This study aims to assess farmer preferences and willingness-to-pay (WTP) for HWC mitigation measures and to estimate the household-level damage costs resulting from HWC in the North Central Province, a hotspot for HWC. Data were collected from 310 farmer households in North Central province through face-to-face interviews using a semi-structured questionnaire and choice cards. Results show that 94.1% of respondents engage in agricultural activities primarily, and 88.3% of respondents have experienced wildlife conflicts. The total economic loss was estimated by aggregating both direct and indirect costs, including crop damage, grain loss, livestock damage, property loss, mitigation costs, human injury, and fatality costs, estimated using the Value of Statistical Life (VSL). The average total household damage cost was Rs. 478,069 per season, with human fatalities accounting for over 75% (Rs. 362,049) of the cost. A Choice Experiment (CE) was conducted to elicit farmers' Willingness-to-Pay (WTP) for HWC mitigation options, and responses were analysed through Stata 17 according to both Conditional Logit (CL) and Random Parameter Logit (RPL) models. Model estimations revealed that farmers significantly valued compensation-based strategies. The highest marginal WTP values were observed for 75% additional compensation for death or injury (Rs. 933.37) and 25% relief for crop loss (Rs. 798.35), indicating support for relief measures. Farmers prefer to financially support the mitigation effort, as evidenced by the total monthly MWTP of Rs. 1,989 per household. These findings offer critical direction for policymakers in designing farmer-favoured and cost-effective HWC mitigation programs. Supported by total cost estimates, the choice experiment confirms the practical relevance of community preferences, underscoring the need for inclusive, species-specific, and location-based, well-compensated mitigation programs that align with coexistence for rural, vulnerable communities.

Keywords: Choice experiment, Compensation, Damage cost, Mitigation, Willingness-to-pay -pay

Short-Run Profit Response to Input Prices in Sri Lanka's Paddy Sector: An Economic Evaluation

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This study investigates the short-run profit responsiveness of Sri Lanka's paddy sector to variations in input prices, with attention to both rainfed and irrigated cultivation systems. It analyzes own-price and cross-price elasticities of input demand and output supply through a restricted translog profit function framework, drawing on nationally representative data spanning 2000–2024. The analysis employs a restricted normalized translog profit function, estimated under the theoretical constraints of symmetry and homogeneity. The analysis employed a Seemingly Unrelated Regression (SUR) framework to derive own and cross-price elasticities of input demand and output supply, offering empirical insights into how paddy farmers adjust their production decisions in response to changing economic conditions. The results reveal that the profit of paddy farming responds positively but inelastically to fluctuations in output prices, with irrigated farmers demonstrating greater responsiveness compared to rainfed farmers. Both labor and fertilizer costs stood out as the key limiting factors for rainfed systems, while machinery costs considerably influenced profitability in irrigated systems. Verification of limited substitution among inputs, specifically labor and machinery, emphasizes structural constraints in input allocation, whereas some estimated elasticities, particularly seed and machinery, yielded exaggerated magnitudes. The results further suggest the necessity for targeted fiscal assistance for labor and fertilizer in rainfed spheres, influenced access to financially feasible mechanization in irrigated areas, and mechanized approaches for border price stabilization and stable output price mechanisms to safeguard farm incomes. Moreover, policies fostering border price stabilization and guaranteed baseline prices could bolster farm income stability and inspire sustained production. These insights serve as a basis for guidance for policymakers seeking to influence efficiency, sustainability, and durability in Sri Lanka's paddy production.

Keywords: Agricultural policy, Input demand elasticity, Output supply response, Price fluctuations, Profit function, Rainfed cultivation

Impact of Income Tax Policy Changes on Household Welfare: A Computable General Equilibrium (CGE) Analysis

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This research focuses on understanding how the recent changes made to Sri Lanka's income tax laws have affected household welfare. To study this, a Computable General Equilibrium (CGE) model was developed using the General Algebraic Modelling System (GAMS), based on data from the 2021 Social Accounting Matrix (SAM). The model captures the relationships among key economic players, households, the government, and major production sectors such as services, agriculture, and food manufacturing. Using the CGE framework made it possible to examine not only the overall economic impacts of tax rate changes but also their effects on household level welfare. Between 2021 and 2023, the Sri Lankan government introduced several fiscal reforms, increasing the average income tax rate from 18% to 36%. These reforms were mainly aimed at strengthening government revenue and addressing the country's budget deficits. However, according to the simulation results, while these measures did help achieve short-term fiscal targets, they also led to noticeable negative consequences for households. In particular, disposable income levels declined especially among lower and middle income families, which in turn reduced their spending capacity. As a result, sectors like agriculture, food processing, and services, which rely heavily on domestic demand, experienced drops in both output and employment. Overall, the findings suggest that the recent tax reforms have had regressive effects, disproportionately burdening more vulnerable groups. Although government revenue improved, the broader outcomes raise important concerns about fairness and the long-term sustainability of such fiscal strategies. Therefore, this study emphasizes the need to integrate welfare considerations into the process of tax policy design. By assessing how income tax changes influence income distribution, the research provides valuable insights for developing fairer and more sustainable fiscal policies. Ultimately, these findings can guide policymakers in creating progressive tax systems that promote both social equity and economic stability as Sri Lanka continues its path toward recovery.

Keywords: CGE model, GAMS, Household welfare, Income tax, Social accounting matrix

**Abstracts of the Undergraduate Research Competition
(Poster Session)**

Modeling Price Volatility and Inter-Market Linkages of Key Fresh Fish Commodities in Sri Lanka: Evidence from a Multivariate GARCH Model

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This study analyzes price volatility dynamics and market interdependencies in Sri Lanka's fresh fish sector using advanced multivariate GARCH methodology. Weekly retail price data from January 2008 to May 2025 cover nine commodities; Salaya, Hurulla, Balaya, Kelawalla, Thora, Paraw, Mora, Shrimps, and Thalapath across fourteen regional markets, including Colombo, Kandy, Anuradhapura, Matara, Galle, and others. Commodities are grouped into small fish (Salaya, Hurulla) and large fish (the remaining seven species) based on biological and market characteristics. Preliminary testing with Augmented Dickey-Fuller, Phillips-Perron, and KPSS unit root tests, alongside ARCH-LM, Box-Ljung, and BDS diagnostics, confirms pervasive non-stationarity and volatility clustering, requiring logarithmic transformation. Seasonal volatility patterns are evident, particularly during monsoon periods and festive seasons. The core analysis employs a BEKK-GARCH framework, capturing both spatial transmission and cross-species interdependencies. Results reveal a clear dichotomy: small fish display contained, market-specific volatility (Colombo: ARCH=0.30, GARCH=0.88) with limited spillovers, while large fish exhibit strong cross-market transmission, notably along the Colombo–Kandy corridor ($A_{12}=0.024$, $p<0.05$). Asymmetric interdependencies emerge, including substitution between Salaya and Hurulla ($A_{21}=-0.123$, $p<0.001$) and competitive interactions among large fish, with Kelawalla identified as a volatility epicenter. Large fish also show persistent own-volatility and significant coastal-to-inland spillover effects, while Colombo demonstrates the strongest volatility persistence. Policy implications are substantial: small fish require localized stabilization measures, whereas large fish demand integrated supply chain management to mitigate transmission effects. For market participants, findings highlight commodity-specific volatility drivers, substitution dynamics, and spatial spillovers, offering valuable insights for risk management in Sri Lanka's dynamic fresh fish markets.

Keywords: Fish commodities, Market linkages, Multivariate GARCH model, Price volatility, Risk management strategies

Analysis of Coconut Shell Activated Carbon Exports from Sri Lanka

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Sri Lanka is recognised as the world's third-largest exporter of coconut shell activated carbon (CSAC), accounting for 16.9% of global exports while contributing nearly 17% to the nation's total coconut export earnings. Given the strategic role of CSAC in both the international market and the domestic economy, this study investigates the long-term export performance of Sri Lanka by analysing trends, comparative advantage, and trade directions from 1976–77 to 2022–23. The research adopts a quantitative approach, relying on secondary data sourced from the Coconut Development Authority (CDA), the Asian and Pacific Coconut Community (APCC), and the UN Comtrade database. Analytical techniques applied include trend analysis, Revealed Comparative Advantage (RCA), and Markov Chain Analysis, conducted through R software and MS Excel. Findings reveal that a quadratic model with an R-squared of 0.9407 best represents the non-linear growth trajectory of CSAC exports, confirming a sustained upward trend with an average annual increment of 980.1 MT. The RCA values, consistently above 1, indicate that Sri Lanka holds a strong comparative advantage in CSAC exports, though India and the Philippines record even higher competitiveness levels. The trade direction analysis highlights major export destinations. In the Americas, the United States (90.78%) and Canada (76.1%) dominate as long-standing markets, with Brazil emerging as a promising future destination. In Africa, South Africa (98.4%) and Ghana (69.1%) serve as stable partners. European demand is concentrated in the United Kingdom (89.4%), Germany (61%), and Italy (51.4%), while France and Turkey appear as emerging markets. In Asia, Japan (43.5%) and China (34.4%) are dominant, and Hong Kong shows potential as a new growth hub. Overall, the Sri Lankan CSAC industry demonstrates strong resilience and growth prospects, underscored by its established comparative advantage and expanding market opportunities. The study concludes that CSAC remains a high-value export commodity capable of further strengthening Sri Lanka's foreign exchange earnings. Therefore, policymakers and industry stakeholders should prioritise diversification of markets, value addition, and sustainability practices to ensure the long-term competitiveness of the sector.

Keywords: Coconut export earnings, Comparative advantages, Trend analysis, Trade direction, UN Comtrade database.

Quantifying the Ripple Effects of Climate-Induced Agricultural Shocks on Sri Lanka's Economy: A CGE-Based Analysis

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The agriculture sector in Sri Lanka is central to its economy, making a significant contribution to GDP, employment and rural livelihoods. However, the national economy faces significant challenges as a result of the adverse effects of climate change on agricultural productivity. Previous climate change studies in Sri Lanka have focused on specific crops or regions using partial equilibrium models which failed to capture the economy-wide impacts. However, the broader macroeconomic and sectoral impacts of climate change have been assessed globally, especially in agriculture-dependent economies. A Computable General Equilibrium (CGE) model calibrated to a 2021 Social Accounting Matrix (SAM) is used in the study to assess the economy-wide implications of climate change on Sri Lanka's agriculture sector. Prices, exports, household income and consumption, welfare, factor prices, and GDP composition were captured endogenously within the model through a set of behavioural and market clearing equations. Two distinct climate shock scenarios were simulated in the study as 5%, 10% and 20% productivity shocks across the agriculture sector in the first case and paddy-specific shocks of 5%, 18%, and 31% in the second case. The results show a considerable decline in exports, GDP contribution, welfare and household income with larger consequences resulting from stronger shocks. Vegetable exports reduced by 47.2% and welfare by 1.08% in the high shock (20%) scenario. The non-agricultural sectors show minimal effects, while food manufacturing showed slight gains due to forward linkages. Labour prices drop more than capital prices, highlighting the labour intensity of the agricultural sector. Similarly, targeted shocks to paddy showed notable declines in welfare, income, and GDP. A quantitative foundation is offered in this study to understand sectoral and macroeconomic consequences of climate induced productivity shocks in agriculture, offering crucial insights to promote long term economic sustainability through the development of targeted, climate resilient policy measures.

Keywords: Agricultural Productivity, Climate Change, GAMS, General Equilibrium, Social Accounting Matrix

Assessing Socio-Economic and Environmental Implications of Household Food Waste in Sri Lanka Using an Index-Based Approach

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Food waste is one of the most critical challenges undermining food security, environmental sustainability, and household well-being in Sri Lanka. Despite global efforts to halve food waste by 2030, excessive disposal of edible food at the household level continues to threaten the achievement of several Sustainable Development Goals (SDGs). This study developed a novel Household Food Waste Index (FWI) to quantify food waste across Sri Lanka, linking it to SDGs 2, 12 and 13. Using Principal Component Analysis (PCA) on data from 1,010 households in 25 districts (2021–2025), it identified key drivers, informed targeted policies, and offered actionable insights for sustainable consumption. This nationwide quantitative cross-sectional survey measured household food waste across all the 25 districts. Using a structured questionnaire administered by enumerators, data from 1,010 households captured demographic, socio-economic, and behavioral factors. Analysis applied PCA (KMO = 0.62, significant Bartlett's test) with min–max normalization, varimax rotation, and evidence-based weighting to build a composite Household Food Waste Index aligned with SDGs 2, 12, 13. The method identified key waste drivers, produced district-level indices, and generated policy-relevant, generalizable insights for targeted interventions and tracking progress over time. The FWI analysis revealed substantial inter-district disparities: Hambanthota, Kegalle, Matale, Nuwara Eliya, and Polonnaruwa excelled in SDG 2; Monaragala, Rathnapura, and Trincomalee in SDG 12; and Gampaha, Galle, Hambanthota, Nuwara Eliya, and Rathnapura in SDG 13. Key facilitators included household gardens, effective leftover use, systematic meal planning, heightened environmental awareness, and higher education of food decision-makers. Major barriers comprised expiry-date misinterpretation, inadequate storage practices, higher waste in large households with children, limited awareness of climate–waste linkages, and poor purchasing and consumption planning. The Food Waste Index provided a linkage for accessing the impact of the sub-indicators for the SDGs and that will be an actionable insight for policymakers, households, and communities as a practical benchmark to reduce household food waste. It will be a powerful and achievable step in paving the way for the successful realization of these SDGs by 2030.

Keywords: Environmental factors, Household Food Waste, Household Food Waste Index, Socio-economic factors, Sustainable Development Goals

Winners of the Undergraduate Research Competition

- **Gold Medal for the Best Undergraduate Research in Agricultural Economics in Sri Lanka:**

W.M.C.S. Senevirathne, Department of Agribusiness Management, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka.

“Impact of Human Wildlife Conflict on Farmer Households:
A Study in the North Central Province of Sri Lanka”

- **Silver Medal for the Second-Best Undergraduate Research in Agricultural Economics in Sri Lanka:**

D.P.S. Siriwardhana, Department of Export Agriculture, Faculty of Animal Science and Export Agriculture, Uva Wellassa University of Sri Lanka.

“Short-Run Profit Response to Input Prices in Sri Lanka’s Paddy Sector:
An Economic Evaluation”

- **Bronze Medal for the Third Best Undergraduate Research in Agricultural Economics in Sri Lanka:**

G.G.N.V. Gunasena, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya.

“Evaluating the Economic Effects of a Uniform Tariff on Rice Imports in Sri Lanka: A Partial Equilibrium Analysis”

Programme Agenda

Sri Lanka Agricultural Economics Association (SAEA)

Nineteenth Annual Research Forum (19th ARF)

“Innovations and Transitions: Driving Agricultural Change for Economic Growth and Stability”

12th December 2025

Delivered in collaboration with

Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI), DIMO Agribusinesses (Platinum Sponsor) and IUCN (Gold Sponsor)

08.30 - 09.00 am	Registration and Refreshments
09.00 - 11.45 am	Inaugural Session at Mahinda Silva Auditorium
09.00 - 09.05 am	Lighting of the Traditional Oil Lamp
09.05 - 09.10 am	National Anthem
09.10 - 09.20 am	Presidential Address – Dr. Shamen Vidanage, President, SAEA
09.20 - 09.30 am	Address by the Chief Guest – Prof. A. L. Sandika, Director / Chief Executive Officer, HARTI
09.30 - 10.00 am	Keynote Speech – Dr. Filipe Dizon, Senior Economist, Agriculture and Food Global Practice, World Bank Group
10.00 - 11.00 am	Panel Discussion <i>“From Margins to Mainstream: Agriculture, Innovation, and Economic Growth”</i>
11.00 - 11.15 am	Agricultural production landscapes for biodiversity conservation: Other Effective Area-based Conservation Measures (OECMs) – Mr. Prince Manamperi, Programme Officer, IUCN
11.15 - 11.25 am	Presentation of SAEA Undergraduate Research Competition Awards
11.25 - 11.35 am	Presentation of SAEA Postgraduate Research Awards
11.35 - 11.50 am	Felicitation of Prof L M Abeywickrama, the 1 st SAEA life member elected to the Parliament of Sri Lanka
11.50 - 11.55 am	Vote of thanks - Ms Pradeepa Dembatapitiya, Secretary, SAEA
11.55 - 12.00 noon	Group Photo
12.00 - 01.00 pm	Annual General Meeting of SAEA <i>(SAEA members only)</i>
12.30 - 01.45 pm	Lunch
01.45 - 3.45	Contributory Paper Presentations
	Undergraduate Research Presentations
03.45 - 04.15 pm	Closure of the ARF 2025 with Tea

Contributory Paper Session

Chairperson: Dr. Parakrama Weligamage, University of Peradeniya.

Panel Members: Prof. Sisira Rajapakshe, Rajarata University of Sri Lanka.

Session Coordinator: Prof. Nilantha De Silva, University of Ruhuna.

Time	Presentation
01.45-02.00 pm	Perceptions of Coconut Growers on the Impacts of Climate Change on the Coconut Industry in Sri Lanka: Evidence from the Coconut Triangle <i>Ruvani S. W. Godage*, B. Gajanayake and U. K. Jayasinghe-Mudalige</i>
02.00-02.15 pm	Economic and Welfare Implications of Rice Market Reforms in Sri Lanka: A CGE Analysis of Productivity, Trade and Price Policies <i>U. Namalgama*, J. Weerahewa and S. Dissanayake</i>
02.15-02.30 pm	Economic Evaluation of the Private Costs Chronic Kidney Disease in Medawachchiya, Sri Lanka: A Cost of Illness Approach <i>Y. M. S. T Yapabandara</i>
02.30-02.45 pm	Enhancing Home Garden Coconut Production and its Implications for Coconut Kernel–Based Industries in Sri Lanka <i>G.V. Norica Aiome *, A. D. J. K. Aluthge, P. C. J. De Silva and S. P. Fernando</i>
02.45-03.00 pm	Spice Tourism and Sustainable Livelihood Development: Evidence from Spice Gardens in Matale, Sri Lanka <i>G.V. Norcia Aiome*, H.M.S.J.M. Hitihamu, G.G.A. Sandamali and A.D.J.K. Aluthge</i>
03.00-03.15 pm	Community-driven Carbon Trading: Rubber Cultivation as a Climate Solution in Sri Lanka <i>E. S. Munasinghe* and V.H.L.Rodrigo</i>
03.15-03.30 pm	Leveraging Circular Agricultural Transformation in Sri Lanka through SEEA-based Natural Capital Assessment and Planning <i>Menuka Udugama*, Sisira Rajapakshe and Prasanthi Gunawardena</i>

Undergraduate Research Presentations

Chairperson: Dr. K. N. Nadeeshani Silva, Dept of Agricultural Economics and Agribusiness, Faculty of Agriculture, University of Ruhuna

Panel Members:

1. Dr. S. N. S. L. P. Neelawala, Dept of Animal Science, Faculty of Animal Science and Export Agriculture, Uva Wellassa University.
2. Dr. Sumali N. Dissanayake, University of Peradeniya.

Session Coordinator:

Dr Sampath Dharmadasa, Uva Wellassa University

Time	Presentation
01.45-02.00 pm	Remittances, Intrahousehold Decision Making and Food Security in Sri Lanka <i>R.A.J.P. Rupasinghe* and R.A.P.I.S. Dharmadasa</i>
02.00-02.15 pm	Evaluating the Economic Effects of a Uniform Tariff on Rice Imports in Sri Lanka: A Partial Equilibrium Analysis <i>U.G.G.N.V. Gunasena</i>
02.15-02.30 pm	Environmental and Economic Trade-Offs of Smallholder Dairy Feeding Strategies in Sri Lanka: An LCA-LCC Approach <i>Y. K.G.A.L.S. Kulasekara*, J.M.M. Udugama, D.M.W.S.H. Dissanayake and M.A. Gunawardena</i>
02.30-02.45 pm	Impact of Human Wildlife Conflict on Farmer Households: A Study in the North Central Province of Sri Lanka <i>W.M.C.S. Senevirathne* and J.M.M. Udugama</i>
02.45-03.00 pm	Short-Run Profit Response to Input Prices in Sri Lanka's Paddy Sector: An Economic Evaluation <i>D.P.S. Siriwardhana* and C. S. Wijetunga</i>
03.00-03.15 pm	Impact of Income Tax Policy Changes on Household Welfare: A Computable General Equilibrium (CGE) Analysis <i>N.Y.N. Silva*, S.D.D.M. Madhumali and J.C. Edirisinghe</i>