TEA DIALOGUE

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WHERE IDEA STEEP AND CONNECTIONS BREW

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From Bondage to Dignity: A Review of Sri Lanka's Plantation Workers: Past and Present

Sri Lanka's plantation sector, rooted in the legacy of British colonization, has long been a paradox of prosperity and neglect. While the agrarian elite reaped the rewards of tea and rubber exports by investing in banks, railways, and industrial infrastructure, the estate labourers remained bound to a feudal hierarchy that prioritized profit over people. Their contributions powered the island's economic transformation, yet their own lives were marked by deprivation. Healthcare, housing, and education were offered only in skeletal form, just enough to sustain productivity. Ceylon tea gained global acclaim, but the hands that plucked its leaves remained invisible.

By the time privatisation swept through the sector in 1992, the conditions on the estates had deteriorated to their lowest ebb. It was in this context that the Plantation Human Development Trust (PHDT) emerged not as a mere administrative body, but as a transformative facilitator of social welfare. PHDT's arrival marked a turning point in the narrative of plantation communities, opening new pathways for empowerment, dignity, and sustainable development.

Today, the plantation sector tells a different story. The bond between workers and management has evolved from one of hierarchy to one of collaboration. Community-based awareness has flourished, and estate families now participate actively in shaping their futures. Under PHDT's community awareness and guidance with the Health ministry support, health indicators have improved such as low birth weight and child malnutrition have declined, sanitation facilities have expanded, and financial literacy has led to increased savings among workers.

Perhaps most inspiring is the cultural shift: plantation families now speak of dignity not as a distant hope, but as a lived reality. Child abuse and gender-based violence have significantly reduced, thanks to the rise of women's groups, water committees, and parent-led development councils. These grassroots structures, nurtured by PHDT, have become engines of sustainability and social cohesion.

Education, once a luxury, is now a beacon. The sight of an estate worker's child entering university is no longer rare it is a proud testament to what inclusive development can achieve. The plantation sector, once synonymous with exploitation, is now a space where dreams are not only born but realised.

This review honours the resilience of Sri Lanka's plantation communities and the quiet revolution led by PHDT. It is a story of transformation from bonded labour to empowered citizens, from survival to dignity, and from isolation to integration. The journey continues, but the direction is clear: forward, together.

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A Sector in Decline: Labour Shortages and Social Disengagement

Social Change in the Sri Lankan Plantation Sector: Beyond Business, Toward Community Empowerment

Continuation 1st Quarter....

L.R. Perera

Social transformation is a gradual, deliberate process, one that demands vision, collaboration, and unwavering commitment. In Sri Lanka's plantation sector, this transformation has taken root not through sweeping reforms or sudden revolutions, but through persistent efforts to uplift communities long marginalized by economic structures. At the heart of this change lies a quiet but powerful movement: the evolution of early childhood care from rudimentary crèches to holistic Child Development Centres (CDCs).

This essay explores how these developments, spearheaded by the Plantation Human Development Trust (PHDT) and supported by global partners like WB/ UNICEF, have redefined the plantation sector, not merely as a site of production, but as a space for empowerment and social equity.

Historical foundations: labour, legacy, and the need for reform

Sri Lanka's tea industry has historically relied on the labour of economically disadvantaged communities, particularly women. These workers, often descendants of Indian Tamil labours brought during colonial times, have faced generations of hardship low wages, poor housing, limited access to education and healthcare, and minimal upward mobility. For decades, the plantation sector operated with a singular focus on productivity, sidelining the social needs of its workforce.

However, the seeds of change were sown during the Janatha Estate Development Board (JEDB) and Sri Lanka State Plantation Corporation (SLSPC) era between 1979 and 1992. During this period, the concept of creches was introduced not as a luxury, but as a necessity.

These early childcare facilities were designed to support working mothers and safeguard young children from the hazards of estate life.

Creches: A response to urgent social needs

The establishment of crèches marked a pivotal shift in plantation policy. These facilities served multiple purposes. With women forming a significant portion of the labour force, crèches allowed mothers to work without compromising their children's safety. are Child Safety and Supervision is important as plantations were dangerous environments for unsupervised children. Crèches provided protection from accidents, exposure to chemicals, and other risks. Though rudimentary, these centers offered nutrition, hygiene, and early stimulation, laying the foundation for better health and educational outcomes. Initially, crèches were modest in scale and scope. Yet their presence signaled a growing recognition that economic development must be accompanied by social responsibility.

Institutional support and the role of PHDT

The transformation of crèches into Child Development Centres (CDCs) was catalyzed by the Plantation Human Development Trust (PHDT), a tripartite organization involving the government, plantation companies, and trade unions during the last 30 years.

With support from international partners such as the World Bank and UNICEF, PHDT began upgrading these facilities to meet higher standards of care. One notable initiative was the renovation of pullemadu, traditional estate buildings repurposed to accommodate infants and toddlers. These upgraded CDCs provided structured environments where children could receive care while their parents worked. The impact was profound:

a. Dual Income Empowerment: With reliable childcare, both parents could contribute to household income, enhancing economic stability.

b. Women's Empowerment: Mothers gained autonomy and a stronger voice in family decision making.

c. Community Well Being: CDCs became hubs of social support, promoting health, education, and cohesion.

Picture of a crèche

UNICEF's transformative Intervention

UNICEF's involvement brought global expertise and resources to the plantation sector's childcare efforts during this period but unfortunately they could not continue. Training Caregivers: Staff were educated in child development, hygiene, and nutrition, ensuring professional standards of care.

But by now most of them have retired no suitable training programmes continued UNICEF funded improvements such as clean water access, sanitation facilities, feeding areas, and safe play areas. Programmes introduced breastfeeding support, nutritional monitoring and basic healthcare to combat malnutrition and disease.

UNICEF's work influenced national standards for early childhood development and broader social protection policies. High Female Labour Participation: Long work hours left infants in unsafe conditions or with elderly caregivers. Poverty, malnutrition, and limited access to services were widespread. Creches lacked structure, stimulation, and hygiene, leading to developmental delays. By improving early childhood care, these programmes aimed to break the cycle of disadvantage.

Long term impact: A blueprint for inclusive development

The evolution of crèches into CDCs has yielded lasting benefits:

Children now enter school with stronger health and developmental foundations. Reliable childcare allows women to work consistently and participate more fully in community life.

The success of this initiative has inspired similar programmes in underserved regions across Sri Lanka. Moreover, the plantation sector's childcare transformation serves as a model for inclusive development one that integrates economic goals with human dignity. It demonstrates that social change is not a by product of development, but a prerequisite for it.

Toward a more equitable future:

The journey of Sri Lanka's then Ceylon plantation sector which started during the colonial era from labour exploitation to community empowerment offers valuable lessons for policymakers, development practitioners, and civil society. It underscores the importance of investing in people, especially in their earliest years. Through the leadership of PHDT and its partners, the sector is being re-imagined not just as a site of production, but as a space where families thrive, women lead, and children grow with hope. Social change may be slow, but it is unstoppable when rooted in compassion, collaboration, and vision. The transformation of early childhood care in Sri Lanka's plantations is proof that even in the most challenging environments, progress is possible and that every child deserves a safe, nurturing start in life.

Enhancing child development in the post colonial Era: The renovation of pulle madu centres

In the post-colonial era, child development has emerged as a critical focus in rebuilding and empowering communities, particularly in plantation regions. One significant step in this direction has been the renovation and upgrading of Pulle Madu, traditional community spaces, into modern **Child Development Centers**. These centers have been redesigned to provide inclusive access for infants and toddlers, ensuring that even the youngest members of plantation families receive early childhood care and stimulation. The revitalized Child Development Centers are poised to significantly improve the quality of life for families working in plantation areas.

By offering a safe, nurturing, and developmentally appropriate environment for young children during work hours, these centres alleviate the burden of childcare from parents, especially mothers.

This initiative enables both parents to actively participate in the workforce, thereby enhancing household income and economic stability.

Beyond economic benefits, the project carries profound social implications. It empowers women by allowing them to engage in paid employment without compromising their children's wellbeing. With reliable childcare support, women gain greater autonomy and a more influential role in family decision-making. This shift contributes to gender equity and strengthens the social change of plantation communities.

Ultimately, the transformation of Pulle Madu into Child Development Centers reflects a broader commitment to inclusive development, social justice, and the long-term wellbeing of future generations. It marks a meaningful stride toward dismantling colonial legacies and building resilient, empowered communities. Policy Objective was to improve the quality of life for plantation workers by providing safe, accessible, and developmentally appropriate childcare facilities, thereby enabling greater workforce participation and promoting gender equity.

Historically, there was no formal government policy regarding preschool, early childhood education, or childcare , apart from basic colonial-era welfare obligations. This lack of structured support posed a major challenge in motivating parents to collaborate with estate management toward a sustainable approach to child development. In response, the estate management, together with the Plantation Human Development Trust (PHDT), took proactive steps to develop community based solutions. These efforts aimed to uplift the living standards of estate workers and promote holistic human development through education and care initiatives.

Picture of a Child development center.

Nationalisation and childcare in Sri Lanka's Plantation sector

Beginning in the 1970s, Sri Lanka initiated the nationalization of large plantations which were owned by the British companies, transferring ownership and management from private entities to state-run organizations such as the State Plantations Corporation and the Janatha Estate Development Board. This shift brought the welfare of plantation communities including childcare, education, and health under direct government responsibility.

As a result, there was a noticeable rise in social welfare and education policies as part of the state's broader development agenda. The government began to standardize services across the plantation sector, aiming to reduce disparities and improve living conditions.

Crèches and day care centres continued to operate, now with increased oversight and regulation, reflecting a more structured and accountable approach to early childhood care.

Importantly, these changes did not occur in isolation. Global discourses on child welfare and early childhood education, emphasizing the importance of the early years in shaping lifelong outcomes that influenced domestic policy thinking. International development frameworks and rights based approaches helped shape Sri Lanka's evolving commitment to the well being of plantation children, embedding local reforms within a wider global movement for equitable and inclusive early childhood development.

Transforming Early Childhood Development in Sri Lanka's Plantation Sector: A post privatisation journey

The landscape of welfare provision in Sri Lanka's plantation sector has undergone significant transformation since the early 1990s. Following the 1992 privatization, the state relinquished direct management of many plantation estates, leading to a more fragmented welfare system. In this new era, private companies and the Plantation Human Development Trust (PHDT) emerged as key players in delivering social services to estate communities.

From Crèches to Child Development Centres (CDCs)

One of the most notable shifts in plantation welfare has been the evolution of child care facilities. Traditional crèches, which primarily served as child minding spaces, gradually transformed into Child Development Centers (CDCs).

These centers adopted a more holistic approach to early childhood care, catering to children aged 6 months to 5 and focusing not just on supervision but on developmental stimulation, nutrition, and health.

This transition marked the beginning of Sri Lanka's Early Childhood Development (ECD) era within the plantation sector. The shift was driven by changing government policies and the influence of international donors, particularly the World Bank, which emphasized the importance of structured early learning environments.

Professionalising childcare: The rise of child development officers

With the transformation of crèches into CDCs came a professionalisation of the workforce. Crèche attendants were replaced by trained Child Development Officers (CDOs), who were required to have formal qualifications,at least an Ordinary Level (O-Level) education followed by specialized training or a diploma in child development. This upgrade in staffing reflected a broader recognition of the importance of early childhood education and care

National push for quality standards.

The concept of Early Childhood Development gained traction nationwide, with increasing emphasis on stimulating learning, promoting health, and ensuring proper nutrition. The government, in collaboration with donors such as the World Bank, initiated efforts to strengthen CDCs across plantation estates. These efforts included the development of national quality standards for ECD and the construction or upgrading of CDC facilities to meet these benchmarks.

By 2016, Sri Lanka had established new national quality standards for ECD. As of 2023, many CDCs in plantation regions had been upgraded to comply with these standards, reflecting a significant improvement in infrastructure and service delivery.

Expanding support services

Beyond infrastructure and staffing, plantation CDCs began to offer additional support services aimed at enhancing child well-being. Morning meal programs were introduced to address nutritional needs, and vegetable gardens were cultivated to promote food security and hands-on learning. Training programmes for teacher assistants and CDOs were also expanded to ensure consistent quality across centres.

Policy milestones and institutional support

Around 2017, the National Child Protection Authority approved National Guidelines for Child Day Care Centers, providing a regulatory framework for operations and safety. Renovation programs targeting day care centres in the plantation sector were launched, further reinforcing the government's commitment to improving early childhood services.In 2023, the government took a decisive step toward formalizing the role of preschool teachers by introducing structured training programs and providing salaries. This move signaled a growing recognition of preschool educators as essential contributors to national development and child welfare. Sri Lanka's journey in transforming early childhood care in the plantation sector reflects a broader commitment to inclusive development.

From fragmented welfare systems post-privatization to a structured, quality-driven ECD framework, the country has made significant strides. With continued support from government bodies, private stakeholders, and international donors, the future of early childhood development in plantation communities looks increasingly promising.

Picture of a newly build ECCD center

Beyond development: Confronting the crisis in Sri Lanka's Plantation sector

Over the past three decades, Sri Lanka has made commendable strides in transforming early childhood care in the plantation sector. From fragmented welfare systems post privatization to a structured, quality driven Early Childhood Development (ECD) framework, the country has invested in infrastructure, training, and policy. Yet, beneath this surface of progress lies a growing disconnect between development efforts and the lived realities of plantation communities.

A Sector in Decline: Labor shortages and social disengagement

Despite improvements in child care and welfare, the plantation sector is experiencing a severe labour shortage. Studies show that between 2011 and 2018, the number of registered tea estate workers dropped by nearly 33%. In some regions, annual labour decline rates exceed 5%, with productivity falling and cost of production rising. Employers now insist that parents register their children in estate CDCs not as a service, but as a strategy to retain families and secure future labour.

This reveals a deeper issue: people are rejecting the system, not because of a lack of services, but because of a lack of dignity, opportunity, and autonomy. The plantation model remains rooted in colonial-era structures, where workers are expected to live, work, and raise families within estate boundaries often with limited mobility, representation, or political voice.

The political and cultural disconnect

Plantation communities are increasingly politically alienated and socially demanding, not out of defiance, but out of frustration. They are no longer passive recipients of welfare , they are active agents seeking change. Yet, the system continues to respond reactively, waiting for demands rather than proactively reshaping the future. Why are we still asking how long this can go on? Why are we still treating registration and retention as remedies? These are not solutions they are symptoms of a deeper crisis.

Toward a New Chapter: Rethinking the Plantation Future
If Sri Lanka truly seeks inclusive development, it must move beyond welfare and toward empowerment. This means:

- Redesigning estate life to offer mobility, choice, and integration with broader society.
- Investing in youth and education not just to retain labour, but to create leaders.
- Recognizing plantation communities as citizens, not just workers.
- Creating political platforms for estate voices to shape policy, not just respond to it.

The transformation of early childhood care is a start, but it cannot be the end. **How can Sri Lanka build systems that reflect those aspirations?**

To be continued..

Nutritional interventions in the plantation communities: "How to combat malnutrition while reducing NCD risk"

Prof. Pujitha Wickramasinghe

Malnutrition is a significant nutritional problem faced by children of Sri Lanka. Undernutrition characterized by stunting and wasting decreased since independence. However, it has plateaued over the last 25 years with hardly any improvement. Overweight and obesity have emerged as new nutrition problems. All forms of malnutrition lead to many health as well as socio-economic issues.

Under nutrition would lead to many health disadvantages such as poor physical growth, low brain growth and development, recurrent infections. Poor physical growth would lead to poor organ growth, which are prone to many illnesses leading to the development of hypertension, diabetes, heart attacks and strokes later in life. They would also be physically weak with poor muscle and bone growth. May not attain good physical build leading to poor personality and weak physique. Poor brain growth associated with poor school attendance due to recurrent infections would lead to low academic achievements leading to poor intellect affecting earning capacity later in life. Further an undernourished girl child would be a small young adult, and when she embarks on a pregnancy, it will affect the outcome of the pregnancy. Most of the time a small mother gives birth to a small baby. The effects of it are long-lasting and have shown that non-communicable risk later in later life is high in those offsprings who are born with a low birth weight (less than 2.5kg).

The first thousand days concept, from the day of conception (270 days of gestation period) to completion of second birthday (730 days during first two years of life), determines the future wellbeing of an adult from the perspective of health, wellness, economic capacity, and well-being.

We do see a major increase in the non-communicable diseases (NCDs) among Sri Lankan adults. More than 80% of deaths are due to major NCDs such as cardiovascular disease (heart attacks and strokes), diabetes mellitus, cancers,liver disease and respiratory illnesses. Obesity is a significant contributor to the origin of such illnesses. According to World Health 2019 data. in Sri Lanka an individual between 30-70 years are having a 13.2% risk of dying of an NCD (CVD, cancer, diabetes, or chronic renal disease) prematurely. This means that a further larger portion of the workforce would be suffering from NCDs affecting their productivity.

Another interesting fact is although the estimated life expectancy at birth in Sri Lanka is 73.8 years for males, 79.8 years for females and 76.9 years for both sexes, the Healthy Life Expectancy at birth is much lower with 65.1years and 69.0 years for males and females respectively and 67 years for both sexes, which shows almost 10 years of life is spend without optimum health.

Roots of malnutrition spans to intra uterine life. A small mother would give birth to a small baby (low birth weight, <2.5kg) thus increasing the risk of becoming under nourished with its related complications or developing NCDs later in life. Therefore, to nurture a baby during pregnancy a girl should embark on a pregnancy with a good nutritional status. A small built girl embarks on a pregnancy would not have a sound nutritional status as well as enough space in her body to let a baby grow well. Therefore, one of the most important periods of a girl child's growth is pubertal period. Providing her with good nutrition and adequate exercise will help her to grow well and attain good health with adequate physique.

All potential mothers should be well prepared before they embark on a pregnancy. If they have any underlying illness, they should be well controlled and shift to medications that would not harm the fetus and optimize nutritional status by having an appropriate BMI. Both undernutrition as well as obesity/overweight increase the risk in the offspring to develop NCD later in life. Therefore, it is important a female have an appropriate prepregnancy BMI of 18.5 -23.0 kg/m2. Start on pre-pregnancy folic acid supplementation. Further, during gestation period the prescribed vitamin (folic acid) and mineral supplements (calcium, iron) or multiple micronutrient supplements should be taken with close monitoring of gestational weight gain. Further, creating a stress free conducive environment is as important as providing medical support during pregnancy.

The newborn baby should be nourished well, and there is no match for breast milk. Breast feeding must be encouraged by providing the necessary support and facilities. Ensuring the maternal nutrition as well as providing adequate maternity leave for the working mother strengthens breast feeding and care of the newborn. fooding and maintaining good variety will help to prevent growth faltering.

Environment of the working mother could be improved to help breast feeding/expressing breast milk. Provide areas to keep children during working hours where she could room in and feed the baby. Provide adequate privacy to express milk as well as facilities to store them hygienically. Timely introduction of complimentary.
Food security is a major issue. However, most of the food security problems in Sri Lanka could be circumvented by acting judiciously. A country with optimum rainfall and sunlight throughout the year and a sea around the country, and more than three thousand inland water tanks with good harvest of both marine and freshwater fish, the people of Sri Lanka should have minimum issues of food insecurity. However, the main issue is that many people are choosy with preconceived ideas such as expensive food are more nutritious, various kinds of food taboos,
overlooking available food in their own garden are few that have contributed adversely to food security. From a younger age if not from the introduction of complimentary food, a wider food diversity should be there. Primarily there are 8 major food groups: breast milk, grains/roots/tubers, pulses/nuts/seeds, dairy milk and products, grains/roots/tubers, pulses/nuts/seeds, flesh foods (meat, fish, poultry, organ meats), eggs, vitamin A-rich fruits and vegetables, and other fruits and vegetables. It is expected at least 5 items out of 8 should be included in the diet.
High price of food commodities is a negative factor to achieve a good diet diversity score. Price of food is determined by many factors, such as production (agriculture sector), transport, processing, retailing etc.

During these processors, a lot of food wasting takes place at different levels, and all adds to the final price of the food item that the consumer must pay. Therefore, a consorted effort should be taken from both sides, the producer/supplier providing it at areasonable price, while consumers also breaking the habit of selecting food driven by taste rather than nutrient content and seasonality. Prices are driven by demand and supply and not by the nutrient content. Therefore, food during season will be less costly while off season costs more.

WASH (water, sanitation and hygiene) concept covers four major areas: safe disposal of child and adult excreta, hand washing with soap at critical times, disinfecting drinking water for children and creating clean play space for children.

Providing nutrition alone is not sufficient to ensure adequate growth and health. Securing a conducive, less stressful socio-political culture and ensuring a secure future is important. An important factor is maintaining a happy preschool environment, thus ensuring happy schooling and education system. Providing an adequate environment for physical activity is a must to keep children physically and mentally healthy. Many preschools and parents do not encourage physical activity, further aggravated by reduced ground space.

This also leads to a child to be unhappy and unhealthy. Schools also having same adverse environment which aggravates the situation.

A WHO has recognized ten Adverse Child Effects (ACEs) that contribute to child's stress which in turn contributes to child malnutrition. It is identified under three broad areas, abuse (physical, emotional and sexual), neglect (physical and emotional) and household (mental illness, mother treated violently and divorce). All these events lead to increased stress and anxiety in children which affects the growth and development the child. Therefore, in the backdrop of such conditions, providing nutrition alone is not sufficient to have optimum growth.

Physical activity is one of the most important aspects in human health. When addressing physical activity, it is important to look at 24-hour movement behaviour which covers sleep, physical activity and sedentariness. Sleep is a component that is neglected largely by the community.

Despite children should sleep for longer hours and most importantly between 10pm and 4 am, many go to sleep late at night and wake up late in the morning. This not only leads to a lot of physical stress but also may be missing meals as well as engage in wrong dietary habits.

Most of the children do not engage in adequate physical activity. Busy school curriculum, extra classes, and addiction to screens have made children to be increasingly sedentary.

Age appropriate adequate sleep and restriction of screen devices (ideally to 1-2 hours a day) would help children to be physically active at all other times.

While being physically active most of the time during the day, they should engage in vigorous physical activity at least one to two hours a day. The health benefits of physical activity are that it improves physical growth, strengthens bones and muscles, burns excess calories and fat in the body and improves mental functions. Physical activity is as important as food. Therefore, it is important to create active societies, environments, people and systems.

There are many stakeholders such as society, schools, local governments, provincial councils and central government and its ministries (Education, Health, Sports, Transport, Urban development & Housing, Finance and law & order). To achieve a high level of physical activity it is important to popularize sports. However, it is important to create a safe environment both physically and psychologically and eliminate social barriers. Develop the infrastructure that is conducive and safe to engage in physical activity.

Combating malnutrition is not mere providing food, there are many factors that directly and indirectly influence growth of a child, which helps to prevent malnutrition. Effects of malnutrition are not short term, but long term and one of the main factors contributing to development of NCD, which has a negative impact not only on individuals and families, but society at large. Therefore parents, society, and governments have the responsibility of providing a favorable environment to combat childhood malnutrition which in return helps to build a healthy population that would benefit society at micro and macro level.

Tapping into Tomorrow: Empowering Rubber Plantation Industry in Sri Lanka through Digital Transformation.

Diluk Priyantha

The present Sri Lankan rubber industry largely relies on traditional, manual systems across cultivation, harvesting, processing, and marketing. This lack of digital integration and modern infrastructure has led to inefficiencies, reduced transparency, and lower productivity, especially among smallholders. As a result, the industry struggles to meet the growing demands of global markets and to remain competitive in terms of quality, traceability, and sustainability.

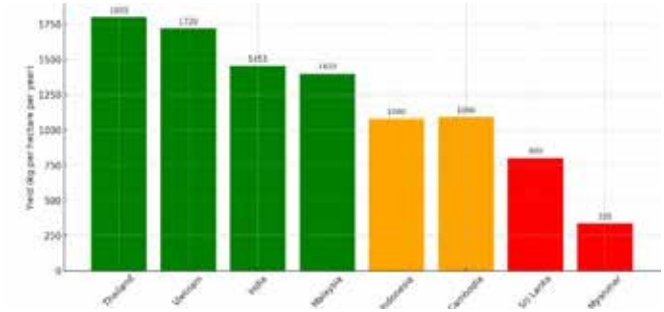

Figure 01: Comparative Rubber yield by country (kg/ha/Year)
Source: Compiled from RRISL, ERIA (Economic Research Institute for ASEAN and East Asia), and FAO reports (2020–2024).

(Figure 01 shows is a visual comparison of rubber plantation productivity across key producing countries.) The chart highlights how:

- **Thailand and Vietnam** lead with yields above 1,700 kg/ha/Year.
- **India and Malaysia** follow in the mid-range (1,400 –1,500 kg/ha/Year).
- **Sri Lanka**, despite its long history in rubber cultivation, shows significantly lower yields (800 kg/ha/Year).
- **Myanmar** lags far behind due to outdated practices and limited modernization.

This gap emphasizes the urgent need for productivity improvement in the rubber plantation industry in Sri Lanka and need to focus on digital transformation, replanting programs, and smart investment schemes as through the proposed Rubber Development Trust Fund (RDTF) to boost Sri Lanka's productivity to global standards.

Digitalization holds immense potential to revolutionize the rubber plantation industry in Sri Lanka, especially for smallholders who often lack access to critical information and resources. The key is to implement solutions that are affordable, user-friendly, culturally appropriate, and directly address their pain points.

In this article, I propose a series of attractive and practical strategies to digitalize the rubber plantation industry in Sri Lanka, with a special focus on empowering smallholders.

The suggestions are structured around five key pillars that collectively aim to modernize the sector, enhance productivity, and increase global competitiveness. These pillars are:

1. Foundational Digital Infrastructure & Ecosystem establishing the necessary digital backbone and platforms;
2. Precision Agriculture & Smart Farming introducing data-driven cultivation techniques;
3. Digital Supply Chain & Market Linkages – improving traceability, logistics, and market access;
4. Digital Financial Inclusion – enabling better access to financial services for growers;
5. Capacity Building & Support–equipping stakeholders with the knowledge and tools to adopt and sustain digital transformation.

Each section explores innovative approaches, technologies, and implementation pathways tailored to the unique needs and challenges of Sri Lanka's rubber sector.

Foundational Digital Infrastructure & Ecosystem

1."Rubber-Go" Mobile App (All-in-One Platform)
Develop a comprehensive, multi lingual (Sinhala, Tamil, English) mobile application that serves as a central hub for all digital services. This app should be designed with a very intuitive, visually driven interface, minimizing text for low literacy users.

Features:

Market Price Alerts: Real time updates on daily raw rubber (RSS, crepe, latex, scrap) prices from different markets/buyers such as Domestic Rubber Buyers, Export Market Buyers, Colombo Rubber Auction (Ceylon Rubber Traders' Association - CRTA).

Weather Forecasts: Hyper local, accurate weather information (rainfall, temperature, humidity) specifically for rubber-growing areas, with short term alerts and seasonal forecasts.

Agronomic Advisory

Disease & Pest Diagnosis: AI powered image recognition (e.g., upload a photo of a diseased leaf) for instant diagnosis of common rubber diseases (e.g., Pestalotiopsis) and pest infestations, with recommended interventions.

Fertilizer Application/Recommendations: fertilizer application cycle management and site-specific fertilizer recommendations based on soil tests (potentially integrated with a digital soil testing service) and tree age management.

Tapping Schedules & Best Practices: Digital guidelines on optimal tapping techniques, frequency (e.g., d/2, d/3), and latex collection for different clones and conditions.

Intercropping Guidance: Information on suitable intercrops, planting calendars, and market trends / opportunities for diversified income.

Government Schemes & Subsidies: Easy access to information on available subsidies, grants, and application procedures, with digital application submission capabilities.

Grower/Smallholder Registration & Profile Management: Enables farmers to easily register their personal details, land size,

rubber clones, and cultivation history to unlock personalized advice, access to subsidies, and streamlined market linkages.

"Ask an Expert" Chat/Voice Function: Connect farmers directly with RRI extension officers or agricultural experts via text or voice messages for personalized advice.

- Training Modules: Short, engaging video tutorials and animated guides that smallholders can access to learn about best agricultural practices, new technologies, tapping techniques, disease management, safety and sustainable farming methods.

- Community Forum: A platform for growers to share experiences, ask questions, and learn from each other.
- Market place. (see below): Intergration for selling their produce.
- Financial Services (see below): Linkages to digital payments, loans, and insurance.

2. Robust Connectivity & Device Access:

- Subsidized Smartphones/Tablets: Partner with telecommunication companies and banks to offer subsidized smartphones or basic tablets with pre-loaded "Rubber-Go" apps and affordable data packages to smallholders.

- Community Wi-Fi Hotspots: Establish community Wi-Fi hotspots in rural rubber growing areas, possibly at co-operative centers or common collection points, to ensure access for those without personal internet.

- "Digital Mitra" Program: Train and equip local youth (e.g., from farming families) as "Digital Mitras" (digital friends/ambassadors) who can assist smallholders with using the app, troubleshooting, and accessing digital services. They can be paid a small fee per service, creating youth employment.

Precision Agriculture & Smart Farming

1. IoT Sensors for Microclimates & Soil:

- Localized Weather Stations: Deploy low cost IoT enabled weather stations in key rubber growing areas to collect real time data on temperature, humidity, rainfall, and wind speed. This data can feed into the "Rubber-Go" app for hyper local forecasts and disease risk warnings.

- Soil Moisture & Nutrient Sensors: For larger smallholdings or clusters, deploy basic soil moisture sensors to optimize irrigation (especially for intercrops or during dry spells) and nutrient levels.

2. Drone Technology for Monitoring & Spraying:

- Aerial Surveys for Plantation Health: Use drones equipped with multispectral cameras to conduct regular surveys of rubber plantations. This can identify stressed trees, areas affected by pests/ diseases (e.g., Pestalotiopsis leaf fall), and nutrient deficiencies much earlier than manual inspection.

- Precision Spraying: Drones can be used for targeted and efficient spraying of fungicides or pesticides, reducing chemical usage and labor costs, particularly in difficult terrain.

- Land Management & Replanting Planning: Drones can generate accurate maps for land demarcation, replanting planning, and assessing stand density.

- "Drone as a Service" Model: Establish local drone service providers (either private or cooperative based) that smallholders can hire on a per-acre basis, making the technology accessible without large upfront investment.

3. AI & Machine Learning for Predictive Analytics:

- Yield Prediction Models: Develop AI models using historical yield data, weather patterns, soil conditions, and clone types to predict future latex yields, helping farmers and processors plan better.

- Disease Outbreak Prediction: AI can analyze sensor data, weather forecasts, and historical disease patterns to predict potential disease outbreaks, enabling proactive prevention measures.

- Tapping Optimization: AI can analyze data on tree health, weather, and previous yields to recommend optimal tapping frequencies and intensities for maximum sustainable latex production.

- Automated Tapping Prototypes: While in early stages, continue research and pilot projects for automated or semi-automated tapping machines, as labor shortage is a critical issue.

Digital Supply Chain & Market Linkages

1. E-Marketplace for Rubber Products

- Direct-to-Buyer Platform: Create an online marketplace within the "Rubber-Go" app or as a separate portal where growers (individually or through co-operatives) can list their raw rubber (and potentially value-added products like rubberwood furniture or rubber bands) for sale directly to buyers/processors. This reduces intermediaries and allows for better price discovery.

- Quality Grading Integration: Incorporate digital quality grading standards (e.g., RSS1, RSS2) into the platform to ensure fair valuation based on quality.

2. Blockchain for Traceability & Trust:

- "Farm-to-Factory" Traceability: Implement a blockchain-based system to record every step of the rubber supply chain, from the smallholder's farm to the processing factory and eventual export. This ensures transparency, authenticity, and sustainability claims for international buyers..

- Certification Verification: Blockchain can verify sustainability certifications (e.g., FSC for rubberwood, various rubber sustainability standards) and organic certifications, adding value to Sri Lankan rubber.

- Digital Contracts & Payments: Facilitate secure digital contracts and smart contracts for transactions, reducing disputes and ensuring timely payments.

3.Digital Logistics & Collection:

- Optimized Collection Routes - Use logistics software to optimize routes for rubber collection vehicles, reducing fuel costs and collection time.

4.Branding "Sri Lankan Rubber":

- Develop and promote a strong national brand for "Sri Lankan Rubber" highlighting its quality and sustainable production practices in global markets. (such as "Ceylon Tea")

5.Input Suppliers:

- Connecting Growers with Essential Input Suppliers To enhance the efficiency and sustainability of the rubber industry, it is crucial to establish strong linkages with various input suppliers. This includes.

- Fertilizer and Pesticide Suppliers: Collaborate with local and international suppliers to provide growers with

access to quality fertilizers and pesticides tailored for rubber cultivation. This partnership can improve crop health and yield.

- Rubber Technology Equipment & tools Suppliers: Integrate providers of advanced rubber processing equipment and tools into the platform, offering growers easy access to the latest technology for improved production efficiency.

- Plant Nurseries: Partner with nurseries to ensure that growers have access to quality planting material, which is vital for sustainable rubber production.

- Chemical Suppliers: Establish relationships with suppliers of necessary chemicals, such as acids used in the rubber processing and coagulation stages, ensuring timely and safe access for growers.

6.Advertising Opportunities and Utilization of Income

Allocating advertising space within the "Rubber-Go" app for input suppliers generates revenue that can be reinvested into app maintenance and improvements.

This cycle of revenue reinvestment supports the fund's goal of sustaining and enhancing digital platforms like "Rubber-Go," ensuring ongoing benefits for growers and suppliers alike.

Digital Financial Inclusion

1.Mobile Wallets & Digital Payments:

- **Direct Payments to Farmers:** Encourage and facilitate direct digital payments from buyers/ processors to farmers' mobile wallets, eliminating cash handling risks and providing a clear transaction record.
- **Financial Literacy Programs:** Offer digital financial literacy training (via the app or in person) to help smallholders manage their mobile wallets, understand digital banking, and access credit.

2."Crop Loan" Digital Platform:

- Micro Loans for Cultivation: Develop a digital platform for smallholders to apply for micro loans for cultivation expenses (fertilizers, labor, replanting) with simplified application processes and faster approval times.

- Digital Credit Scoring: Leverage data from the "Rubber-Go" app (e.g., consistent yield, adherence to best practices, sales records) for digital credit scoring, potentially allowing farmers to access loans without traditional collateral.

3. Parametric Crop Insurance:

- Automated Payouts: Introduce parametric crop insurance policies where payouts are automatically triggered by predefined weather events (e.g., excessive rainfall, drought) detected by IoT sensors or satellite data, eliminating lengthy claims processes.

- Affordable Premiums: Partner with insurance providers and potentially government subsidies to offer affordable premiums for smallholders.

Capacity Building & Support

1. Digital Literacy Training Programs:

- Hands-on Workshops: Conduct regular, practical workshops in local communities to train smallholders and tappers on using smartphones, the "Rubber-Go" app, and other digital tools.

- Visual & Experiential Learning: Focus on visual aids, demonstrations, and hands on practice, recognizing varying literacy levels.

- Local Language Support: All training materials and app interfaces must be available in Sinhala and Tamil.

2.Collaboration with Telcos & Tech Startups:

- Public Private Partnerships: Foster strong partnerships between the Rubber Research Institute (RRI), Rubber Development Department (RDD), telecommunication companies (Dialog, Mobitel, SLT), local tech startups, and universities.

- Innovation Challenges: Launch innovation challenges or hackathons to encourage tech startups to develop tailored digital solutions for the rubber industry.

3.Data Privacy & Security:

Robust Data Protection:

Ensure all digital platforms and data collection adhere to strict data privacy and security protocols to build trust among farmers.

Farmer Data Ownership:

Clearly communicate how farmer data will be used and ensure farmers retain ownership and control over their data.

Integrating these forward-thinking initiatives under the umbrella of the proposed Rubber Development Trust Fund (Proposed in my previous article which was published in "Tea Dialogue" magazine, Volume - 01 under the title of "Securing the Future of Sri Lanka's Rubber Sector Through Innovation and Investment" (Issue Number 2025/01 – Page No 51) , we can showcase a comprehensive strategy to modernize and elevate the Sri Lankan rubber industry, fostering growth and sustainability in alignment with broader economic and environmental goals.

By adopting these attractive and valuable digital solutions, Sri Lanka's rubber industry can enhance productivity, improve efficiency, empower smallholders with critical information, improve market access, and ultimately contribute to a more resilient and prosperous rubber sector.

Child Well-being through Alcohol Reduction: A Community-Based Intervention in Sri Lanka's Plantation Sector

A.C.Raheem

Introduction :

In an effort to address the impact of alcohol consumption on child wellbeing, the Alcohol and Drug Information Centre (ADIC) partnered with Horana Plantations PLC to implement a targeted alcohol prevention programme. Conducted across five selected estates, the initiative placed particular focus on the Lower Cruden Division of the Stockholm Estate, where efforts centered on reducing alcohol use among parents to directly enhance the lives of their children.

This programme emerged from community discussions that revealed a pressing need: improving children's wellbeing by tackling parental alcohol use. The intervention, therefore, adopted a holistic approach, integrating child focused development with household level alcohol reduction strategies.

Objective :

The primary objective of the initiative was to improve children's education, health, protection, and nutrition by minimizing alcohol use within households. By supporting both children and parents through structured activities and awareness, the programme aimed to create a healthier, more supportive family and community environment.

Methodologies

Skill Development Activities :

A comprehensive Skill Development Programme was introduced for children in the division to foster growth in personal, social, and academic domains. Key components included:

Cultural Events: Celebrated heritage and promoted creative expression.Child-Run Markets: Instilled leadership qualities, teamwork, and financial literacy.Interpersonal Skill Development Sessions: Enhanced children's ability to communicate and build positive social connections.

Competitions: Encouraged participation, built confidence, and showcased talents.Special Literacy Classes: Focused on academic improvement and reading skills.These activities not only promoted development but also served as a platform for children to engage in constructive, alcohol free environments.

The Unwanted Expenditure Calendar :

A notable feature of the intervention was the introduction of the Unwanted Expenditure Calendar. This simple yet impactful tool helped families monitor their monthly spending on alcohol and other non-essential items. At the end of each month, alcohol users were encouraged to reduce their expenditure in the coming month.
By making financial losses visible, families became more conscious of their budgeting habits. This approach empowered households to reallocate funds toward more productive and supportive uses, including child education, savings, and household improvements.

The Healthy Day Plate: Structuring children's lives

To promote balanced daily routines among children, the programme introduced the Healthy Day Plate. This visual guide helped families structure children's daily activities, encouraging a holistic balance between:

I. Education
II. Time with family and friends
III. Hobbies and entertainment
IV. Play and physical activity
V. Spiritual and personal wellbeing

The "plate" was updated monthly to reflect individual progress and was used differently by age: younger children's plates were monitored by parents, while older children managed them independently. As of the latest report, 78 out of 90 children were actively using the Healthy Day Plate demonstrating its strong uptake and motivational impact.

Home Visits: Strengthening Family Connections,

To reinforce the impact of the programme within households, regular home visits were conducted. These visits allowed programme facilitators to understand each family's unique environment, offer tailored guidance, and maintain a supportive relationship with both parents and children.
The personal touch of these visits helped build trust and ensured that interventions were context-sensitive and responsive to the real needs of each household.

Empowering Parents: Skills and Motivation : Recognizing that parents play a critical role in shaping child wellbeing, the programme also included:
Parental Skill Development Sessions: Aimed at improving parenting practices and child guidance strategies.

Motivational Programmes:

Encouraged parents to reflect on alcohol's impact and inspired them to take proactive steps toward reducing consumption and supporting their children's development.

These sessions helped parents recognize their role in shaping a safer, more nurturing home environment and strengthened their commitment to change.

Key Outcomes

Transforming Lives Through Reduction of Alcohol Use

The programme recorded significant outcomes across various dimensions of family and child wellbeing:
Educational Improvements of 8 school dropouts, 7 returned to school.5 children showed notable academic improvement.16 children demonstrated strong leadership by voluntarily conducting awareness campaigns.Violence Reduction and Emotional Well beingAlcohol-related violence ended in 15 households.In 2 homes, children who previously expressed anger toward their parents no longer did so, reflecting improved emotional health.

Reduced Alcohol Use

- 35 of 90 fathers reduced their alcohol consumption.
- 2 fathers completely stopped drinking.
- Improved Household Financial Management
- Alcohol spending was reduced in 35 households.
- Saved money was reinvested in:
- Small self-employment ventures
- Health, Hygiene, and Nutrition
- Hygiene improved in 40 children.
- Home gardening resumed in 38 households, enhancing nutrition and family bonding.
- Increased Parental Awareness
- Even in homes where alcohol use continued, parents took steps to protect children from the influence and harm of the alcohol industry.

Enhancing Protection Against Alcohol-Related Harm
The programme also placed an emphasis on educating both children and parents about personal safety and awareness. As a result:
65 children and 58 mothers enhanced their understanding of the dangers posed by alcohol users.
They gained awareness on how to recognize manipulation, harassment, and violence related to alcohol use.
The sessions helped families build resilience against social and domestic exploitation.

Key Learnings

One of the most critical lessons from the programme was the effectiveness of integrating alcohol prevention into broader development activities. By aligning alcohol reduction with goals like education, safety, nutrition, and financial empowerment, the initiative gained community buy in and relevance.Perhaps most powerfully, when parents saw tangible improvements in their children's behavior and well being, they were more motivated to address their own habits. This visibility of change created a positive feedback loopchildren inspired parents, and parents' efforts reinforced their children's growth.

Conclusion

The "Child Well-being through Alcohol Reduction" initiative stands as a compelling example of how community level collaboration and holistic planning can address deep rooted social challenges. By focusing on both prevention and empowerment, and by fostering positive child-parent dynamics, the programme succeeded in laying the groundwork for sustainable transformation.

Acknowledgement

The Alcohol and Drug Information Centre (ADIC) gratefully acknowledges the vital support of Horana Plantations PLC and the Plantation Human Development Trust (PHDT). Their collaboration has been instrumental in implementing this impactful programme and nurturing positive change within plantation communities.

"Clinically Proven Health Benefits of Ceylon Tea in Modern Scientific Research"

Dr. Paba Palihawadana

Ancient Wisdom in Every Sip

1. Tea has been revered for centuries—not just as a comforting beverage, but as a healing ritual. Dating back to the **3rd century AD,** tea has woven itself into the fabric of human wellness.Imagine your ancestors, gathered by a fire, gently simmering black tea leaves not yet aware of the science, but intuitively creating a drink that would calm, restore, and protect. Today, modern science is confirming what they instinctively knew: tea heals.
2. From the **sun-kissed highlands** of Sri Lanka comes a gift to the world **Ceylon tea.** Famous for its rich aroma, golden hue, and bold taste, Ceylon tea offers much more than flavor: it's a powerhouse of health benefits, rooted in ancient tradition and proven by modern research.

The Power of Ceylon Black Tea: A Natural Ally Against NCDs

A Bold Brew for a Healthier Life

Derived from the Camellia sinensis plant and oxidized to perfection, Ceylon black tea is rich in polyphenols like catechins, theaflavins, and thearubigins. These compounds are responsible for its deep color and its deep impact on health.
Grown in Sri Lanka's rich, mist-draped plantations, Ceylon black tea is derived from the Camellia sinensis plant. Once harvested, the leaves undergo careful oxidation,a process that unlocks potent antioxidants like catechins, theaflavins, and thearubigins. These polyphenols are the secret behind black tea's remarkable health-boosting properties.

Scientifically Proven Health Benefits

The health benefits of black tea are supported by a growing body of scientific research. Here's how it helps improve quality of life and prevent non-communicable diseases (NCDs):

A Natural Shield for Your Body

Brimming with polyphenols, flavonoids, and antioxidant compounds such as myricetin, quercetin, and kaempferol, black tea helps protect your cells from oxidative damage, a factor linked to chronic conditions including heart disease and some forms of cancer. Its natural caffeine and L-theanine offer a gentle lift in alertness, without the jitters.

Ceylon black tea contains:

- **Antioxidants (quercetin,** kaempferol, myricetin)
- **Flavonoids**
- **L-theanine & caffeine**

These compounds protect cells from oxidative stress, a major factor in **heart disease, cancer, and premature aging.** The caffeine-L-theanine blend also enhances focus without causing anxiety or jitteriness.

A Heartfelt Brew: Cardiovascular Protection

Black tea offers remarkable benefits for heart health. The theaflavins it contains help reduce harmful LDL cholesterol and triglycerides, contributing to improved cardiovascular function. Regular consumption may also assist in lowering both systolic and diastolic blood pressure. In addition, drinking three cups daily may reduce the risk of developing type 2 diabetes by up to 42%, as black tea positively influences glycemic control. Its rich antioxidant content further supports artery health and may reduce the risk of atherosclerosis particularly in women.

Glowing from Within Skin & Beauty Benefits.

Black tea can be a natural ally for healthier skin. Its antibacterial properties, combined with caffeine, help combat acne and skin infections. The tea is also rich in skin-friendly nutrients, including vitamins B2, C, and E, along with minerals like zinc and magnesium. These compounds work together to maintain skin elasticity and reduce visible signs of aging, promoting a youthful glow from within.

Mindful Moments

When it comes to mental clarity and focus, black tea provides a balanced boost. The combination of caffeine and L-theanine enhances brain wave activity, improving focus and sustained attention without the jittery spikes associated with coffee. This gentle stimulation can also uplift your mood and reduce anxiety, offering a calm sense of alertness. Furthermore, the antioxidants in black tea may help protect against cognitive decline and reduce the risk of neurodegenerative conditions such as Alzheimer's and Parkinson's disease.

Traditional Remedies, Timeless Relief

Black tea has long been embraced as a natural remedy in traditional wellness practices. One of its most familiar uses is soothing a sore throat. The tannins in black tea have mild astringent properties that can help reduce inflammation in the throat, and when paired with honey, it becomes a comforting and effective home remedy.In addition to its soothing effects, black tea can also serve as a gentle digestive aid. When consumed in moderation, it may help alleviate mild, non-bacterial diarrhea and support overall digestion by calming the gut and promoting a healthy digestive rhythm.

Ceylon black tea offers powerful relief for joint discomfort. It contains epigallocatechin, a potent antioxidant even stronger than vitamins C and E. This natural anti-inflammatory compound helps reduce pain and inflammation associated with arthritis, bringing comfort to stiff joints and aiding in mobility.

Ceylon Green Tea: Gentle, Pure, and Potent

While black tea is the bold warrior of wellness, Ceylon green tea acts as a gentle guardian. Unlike black tea, it is minimally processed and unoxidized, which allows it to retain higher concentrations of delicate, powerful antioxidants. One of its key compounds, epigallocatechin gallate (EGCG), is a strong antioxidant with anti-inflammatory effects. This makes green tea an excellent natural detoxifier that combats oxidative stress a major contributor to aging and chronic disease.

A Heart-Healthy Elixir

Ceylon green tea not only supports detoxification but also benefits heart and metabolic health. It helps lower LDL cholesterol and supports blood sugar regulation, playing a role in diabetes prevention. Additionally, it promotes healthy circulation and boosts overall metabolic function, making it a soothing yet powerful daily health ritual.

- **Lowers LDL cholesterol**
- **Helps regulate blood sugar,** aiding in diabetes prevention

Nature's Detoxifier

Ceylon green tea is especially rich in epigallocatechin gallate (EGCG), a powerful antioxidant with anti-inflammatory properties.

This nutrient-packed tea combats oxidative stress, a major contributor to aging and chronic disease.

A Metabolism Booster

Green tea catechins gently stimulate fat burning and metabolism particularly when combined with regular physical activity making it a helpful ally in maintaining a healthy weight.

Brain Boost & Emotional Balance

The blend of caffeine and L-theanine promotes a calm alertness, reduces anxiety, and may help stave off memory loss. Regular consumption is linked to reduced risk of cognitive decline and fewer signs of dementia.

Skin Deep Benefits

Green tea's anti-inflammatory and antibacterial properties help fight acne, reduce sun damage, and preserve skin's youthful texture. It also supports oral health by reducing harmful bacteria, protecting gums, and preventing cavities.

Immune Fortifier

By enhancing T-cell function and inhibiting viral replication, green tea supports a stronger immune responsemaking it a smart choice during cold and flu season.

A Sip Toward Wellness

From ancient firesides to modern mugs, Ceylon tea has stood the test of time not just as a beloved beverage but as a trusted companion in health and healing. Whether you prefer the robust depth of black tea or the delicate purity of green, each cup offers a moment of calm and a multitude of benefits.

- 2–4 cups daily are a healthy range for most individuals.
- Those sensitive to caffeine may opt for decaffeinated varieties or limit intake later in the day.
- Tannins can reduce iron absorption. If you're iron deficient, enjoy your tea between meals rather than with food.
- Whether black or green, Ceylon tea is more than traditionit's a clinically supported choice for long-term well-being. Each cup supports your heart, your brain, your skin, and your peace of mind.

So go ahead, pour yourself a cup of Ceylon tea. Your body, mind, and spirit will thank you.

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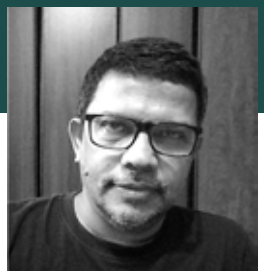
The Crucial Role of Senior and Middle Management in Sri Lanka's Plantation Sector: An Organizational Psychology and Industrial Perspective



Janaka Hewavitharana

Analyzing Human Resource Leadership in a Complex Socio-Economic Landscape

Sri Lanka's plantation sector stands as a pillar of the nation's economy and a testament to its complex historical legacy. Tea, rubber, and coconut plantations have shaped the island's socio-economic trajectory for over a century, providing employment to hundreds of thousands and contributing significantly to foreign exchange earnings (Herath & Ranasinghe, 2009). Yet, beneath the lush canopies and rolling hills lies a sophisticated web of human resource dynamics, where senior and middle management serve as the lynchpins connecting workers, company owners, and government entities.

This article delves into the industrial and organizational psychology (I/O psychology) and business management dimensions of the Sri Lankan plantation sector, emphasizing the pivotal role played by estate CEOs, superintendents, and other senior managers. It analyzes how these leaders not only bridge the gap between labor and ownership but also drive organizational effectiveness, worker wellbeing, and ultimately, sustainable productivity.

Introduction

The management of human resources in Sri Lankan plantations is uniquely challenging. Managers must navigate a landscape characterized by colonial legacies, hierarchical ownership structures, laborintensive operations, and the direct involvement of the government as a landowner. Within this context, the importance of effective senior and middle management specifically estate CEOs, superintendents, and senior executive staff cannot be overstated.

Drawing on peer-reviewed scholarly work and integrating perspectives from industrial/organizational psychology, this article aims to illuminate the multifaceted significance of these roles. The discussion encompasses:

- The historical context and structure of Sri Lanka's plantation sector
- The human resource challenges unique to plantation environments

- The functions and impact of senior and middle management in worker engagement, motivation, and conflict resolution
- The interface between management, company ownership, and government stakeholders
- Implications for policy, practice, and future research.

Historical and Structural Overview of Sri Lanka's Plantation Sector

Sri Lanka's plantation system was formalized during the British colonial period, with vast swathes of land appropriated for commercial agriculture. The structure of the sector remains hierarchical and fragmented, with land technically owned by the government (under the Land Reform Law of 1972) and leased to regional plantation companies (RPCs) often managed by private or semi-private conglomerates (Kumara, 2018).

Management within this sector is typically stratified as follows:

- Upper echelon: Company owners, board of directors, government agencies (e.g., Ministry of Plantation Industries)
- Senior management: CEOs, general managers, and directors of RPCs
- Middle management: Estate superintendents, assistant superintendents, and field officers
- Operational workforce: Supervisors, laborers, and support staff.

This structure creates layers of authority and responsibility, each with distinct challenges and expectations.

Human Resource Challenges in Plantation Environments

The plantation workforce in Sri Lanka is predominantly made up of Tamil-speaking communities who are often socially and economically marginalized (Bastian, 2007). Challenges include:

- Low wages and job insecurity
- Poor living and working conditions
- Lack of social mobility and educational opportunities. Frequent labor disputes and industrial action.

These factors require a nuanced approach to management that goes beyond transactional leadership and demands a deep understanding of motivation, cultural sensitivity, and conflict resolution.

The Role of Senior and Middle Management: An Organizational Psychology Perspective

Organizational psychology highlights the critical role of middle and senior management in shaping workplace culture, mediating between strategic imperatives and operational realities, and fostering employee engagement (Katz & Kahn, 1978; Yukl, 2013). In the context of Sri Lankan plantations, these roles are amplified due to the following factors:

1. Managing Worker Motivation and Engagement

Motivating a workforce that faces systemic disadvantages requires adaptive leadership. Managers must balance extrinsic motivators (such as wages and job security) with intrinsic factors (such as recognition, growth opportunities, and a sense of belonging). Herzberg's Two-Factor Theory (Herzberg, Mausner, & Snyderman, 1959) suggests that hygiene factors alone are insufficient; true engagement arises from meaningful work and recognition.

Senior and middle managers in plantations often serve as role models and mentors, using transformational leadership to inspire commitment and loyalty (Bass & Riggio, 2006). Field studies highlight that plantations with active, empathetic managers' report lower absenteeism, higher morale, and improved productivity (Herath & Ranasinghe, 2009).

2. Conflict Resolution and Industrial Relations

Labor disputes are endemic to the plantation sector, often rooted in deep-seated grievances (de Silva, 2000). Effective management requires not only enforcing company policy but negotiating with trade unions, mediating interpersonal conflicts, and fostering trust. Research underscores that managers who practice participative decision-making and transparent communication are more successful in deescalating tensions (Budhwar & Debrah, 2001).

3. Bridging Strategic and Operational Imperatives

The unique position of senior and middle managers allows them to translate the strategic vision of company owners and governmental policies into actionable plans on the ground. This alignment is crucial for achieving both short-term output targets and long-term sustainability goals. For example, the introduction of sustainable agricultural practices, improvements in worker welfare, and compliance with government regulations all depend on the ability of middle management to operationalize these directives (Kumara, 2018). Their feedback loop to the upper echelons also ensures that policy is informed by practical realities.

4. Navigating Multi-Stakeholder Environments

Sri Lankan plantations are governed by a triangle of interests: the government (as landowner and regulator), private companies (as lessees and managers), and workers (as the operational backbone).
Senior and middle managers are the critical interface between these groups.
At one end, they are accountable to company boards for profitability and compliance; at the other, they are duty-bound to maintain harmonious labor relations and meet statutory obligations on worker welfare. This balancing act requires high levels of emotional intelligence, negotiation skills, and cultural competence (Goleman, 1998).

Case Studies and Evidence from Scholarly Literature

Extensive research corroborates the importance of management in the plantation sector:

- Herath & Ranasinghe (2009) found that estates with proactive and participative management structures

enjoy better productivity and lower labor turnover.

- Buddhapriya (2013) demonstrated that middle managers who build strong relationships with workers can mitigate the effects of systemic disadvantage, leading to higher engagement and loyalty.
- Budhwar & Debrah (2001) highlighted the importance of cross-cultural competence in multiethnic work environments a key feature of Sri Lankan plantations.
- Fernando, Seneviratne & Karunanayake (2016) noted that the professional development of estate management staff is positively correlated with both workforce satisfaction and estate profitability.

Management Practices Driving Organizational Effectiveness

Key management practices identified as drivers of success in the plantation sector include:

- Participative Leadership: Involving workers in decision-making increases buy-in and reduces resistance to change.
- Transparent Communication: Regular, honest updates foster trust and reduce the spread of rumors or misinformation.
- Recognition and Reward Systems: Structured programs that acknowledge outstanding performance contribute to morale and retention.
- Continuous Professional Development: Training programs for both managers and workers enhance skills and prepare the organization for future challenges.
- Wellness and Welfare Initiatives: Addressing not only the professional but also the personal needs of workers have been shown to improve productivity and reduce absenteeism (Herath & Ranasinghe, 2009).

Interfacing with Company Owners and Government Stakeholders

Articulating the Company Vision Downstream

Senior and middle management play a vital role in translating the company's strategic vision into daily practice. They are responsible for implementing key initiatives, such as quality improvement programs, sustainability projects, and new technology adoption.

Upstream Communication and Advocacy

These managers also provide critical feedback to the upper echelon, advocating for necessary resources,

reporting on ground realities, and influencing policy decisions. Their unique vantage point allows them to bridge knowledge gaps between the operational and strategic levels.

Managing Government Relationships

With the government retaining ownership of much of the plantation land, estate CEOs and superintendents must ensure compliance with regulatory frameworks, support audits, and implement government-mandated welfare initiatives. Their ability to manage these relationships can determine the estate's access to incentives, grants, and favorable policy treatment (Kumara, 2018).

Organizational Psychology and the Importance of Middle Management

Organizational psychology literature consistently highlights the significance of middle management in driving organizational change, mediating culture, and maintaining operational stability (Floyd & Wooldridge, 1997; Wooldridge, Schmid & Floyd, 2008)

Sensemaking and Organizational Culture

Middle managers are particularly influential as "sensemakers" they interpret and communicate the meaning of organizational changes to the workforce, reducing uncertainty and resistance (Weick, 1995). In the plantation sector, where changes in wage structures, work processes, or technology adoption can trigger anxiety, effective communication is paramount.

Championing Innovation

Middle management also champions innovation, piloting new approaches at the operational level, gathering feedback, and scaling successful initiatives. Their proximity to the workforce allows them to identify practical challenges early and adapt strategies accordingly.

Well-Being and Psychological Safety

Research by Edmondson (1999) and others underscores the importance of psychological safety for organizational learning and performance. When senior and middle management foster a climate where workers feel valued and safe to voice concerns, productivity and engagement rise.

Challenges Faced by Plantation Managers

Despite their critical importance, plantation managers in Sri Lanka face significant obstacles:

- Resource Constraints: Budget limitations can impact the ability to implement welfare programs or invest in infrastructure.
- Socio-Cultural Barriers: Managers often come from different socio-economic backgrounds than workers, creating gaps in understanding and trust.
- Resistance to Change: Both workers and upper management may resist organizational changes, especially those threatening existing power structures or routines.
- High Stress and Burnout: The demands of balancing multiple stakeholder expectations can lead to stress and burnout among managers (Fernando et al., 2016).

Strategies for Enhancing Management Effectiveness

Peer-reviewed literature offers several strategies for enhancing the effectiveness and well-being of senior and middle managers in plantation contexts:

- Leadership Development: Structured training in transformational and participative leadership models (Bass & Riggio, 2006).
- Cross-Cultural Training: Programs designed to improve cultural competence and communication skills.
- Wellness Programs: Initiatives to support manager mental health, reduce stress, and prevent burnout.
- Succession Planning: Developing a pipeline of future leaders from within the organization to ensure continuity and resilience.

Conclusion: The Indispensable Role of Senior and Middle Management.

The senior and middle management of Sri Lanka's plantation sector estate CEOs, superintendents, and executive staff occupy a uniquely pivotal position in a complex organizational and socioeconomic ecosystem. Their effectiveness determines not only the operational and financial success of the estates but also the well-being and empowerment of a historically marginalized workforce.

From an industrial/business and organizational psychology standpoint, empowering and investing in these managers is not merely a matter of corporate interest, but a socio-economic imperative for the nation. They are the fulcrum balancing the aspirations of company owners, the directives of government, and the hopes of workers. It is through their skill, empathy, and leadership that Sri Lanka's plantation sector can aspire to both sustained competitiveness and greater social equity.

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Protecting the Future of Sri Lankan Agriculture: The Case for a National Agricultural Insurance Scheme

Lalin I De Silva

As Sri Lanka faces worsening climate uncertainty, rising input costs, and falling farmer confidence, the time has come for bold action to secure the future of its agriculture. One of the most effective tools available is agricultural insurance—a safety net that protects both farmers and the national economy from the shocks of climate change, market volatility, and production failures.

Across the tropical world in 2025, agricultural insurance schemes have evolved into essential components of rural development policy. From India and the Philippines to Kenya and Brazil, governments have recognized that traditional relief after disaster is no longer sufficient. Instead, they are moving toward proactive, insured farming systems that promote resilience, reduce dependence on emergency funds, and encourage continuous investment in cultivation.

The Indian example stands out for its scale and scope. Under the Pradhan Mantri Fasal Bima Yojana (PMFBY), over 2 million farmers are insured annually, with the government covering up to 90% of the premium in rain-fed areas. In 2025, India further expanded the Restructured Weather Based Crop Insurance Scheme (RWBCIS) to include key plantation crops such as tea, coffee, rubber, and coconut. Using weather indices like rainfall and temperature to trigger payouts, these schemes ensure income stability for long-term crop growers exactly the kind of protection Sri Lanka's tea and rubber smallholders need.

Thailand's Rice Insurance Program, operated through a government-private partnership, provides rice farmers with up to $418 per hectare in compensation, while the Philippines' PCIC program has integrated satellite-based yield indices to streamline claims processing for rice, corn, and high-value crops. In Cambodia, a pilot program offered drought insurance with premiums as low as $10 per hectare and payouts up to $100—designed specifically to match the average profit margins of rice farmers. Meanwhile, in Kenya, mobile-based platforms like "SeeItGrow" enable farmers to submit crop photos and receive rapid payouts of up to $40 per acre, with premiums as low as $1.60.

These programs share common design features: they rely on weather or yield indices to avoid costly field surveys, pool risk across geographical units, and heavily subsidize premiums typically covering 50–90% through public funds. Most importantly, they are tailored to smallholders.

Technologies like satellite imaging, mobile reporting, and digital payments have slashed administrative costs and reduced fraud, making insurance viable even for farmers with less than 1 hectare. Sri Lanka currently lacks a comparable system. While we have a strong plantation sector, a growing high-value fruit and vegetable market, and a vast community of rain-fed paddy farmers, they remain largely exposed to unmitigated risks. The cost of inaction is visible: loss of livelihood, food insecurity, and long-term declines in productivity as farmers abandon cultivation. Post-disaster relief is expensive, slow, and unsustainable. The only logical alternative is a structured, proactive crop insurance framework.

The inclusion of perennial crops in these insurance models is critical. While annual crops like paddy and maize can be replanted each season, perennials such as tea, rubber, coconut, and fruit trees require years of investment. A single climatic event such as prolonged drought, high wind, or pest infestation can erase years of farmer income. India, Vietnam, and Uzbekistan have already demonstrated that it is possible to design indexed insurance products for perennials, calibrated to climate zones and historical production data. These models can and should be adapted for Sri Lanka.

The motivations behind these global insurance schemes are clear and shared across nations:

- Financial resilience: Farmers receive payouts when crops fail, allowing them to replant or repay loans.
- Cultivation encouragement: Farmers are more likely to stay in agriculture if risks are partially covered.
- Credit access: Banks are more willing to lend when insured crops serve as collateral.
- Technology adoption: Insurance is often bundled with climate-resilient practices, input support, and advisories.
- Climate adaptation: Insurance cushions the economic impact of droughts, floods, and pests now increasingly frequent.

Sri Lanka should take urgent steps to legislate and implement a National Agricultural Insurance Scheme covering both annual and perennial crops, starting with pilot districts in each province. The government can partner with private insurers, use satellite and meteorological data to define risk zones, and structure premiums similar to India's capped 2–5% contribution by farmers. Compensation levels can reflect actual production costs, with payouts of $300–700 per hectare for high-value crops like tea and rubber.

In conclusion, agriculture is the backbone of our economy and a key pillar of our national identity. Protecting it is not just about helping farmers it is about safeguarding food security, sustaining exports, and achieving economic stability. Agricultural insurance is a tested and scalable solution. Sri Lanka must act now not after the next drought, not after the next flood, but today to institutionalize agricultural insurance as a national priority.

Let us shift from reactive relief to proactive protection. Let us build a climate-resilient, insured agriculture sector that empowers our farmers, strengthens our plantations, and protects our future.

The Impact of Organic Fertilizer Policy on Sri Lanka's Tea Smallholder Sector

Saman Dissanayake

Historical Context

The plantation economy in Sri Lanka (then Ceylon) was firmly established during British colonial rule in the 19th century. The colonial administration introduced fiscal incentives and structural reforms to promote commercialization and a minimal state, laying the foundation for a capitalist economy (Kurian & Jayawardena, 2014). These reforms catalyzed the growth of the tea industry, which flourished on large estates and generated substantial profits. However, over the past five decades, a significant transformation has occurred. As Moore (1989:179) notes, "one of the significant features of Sri Lankan rural history has been a partial transfer of tea and rubber production from the plantation sector to the smallholder."

Today, over 70% of Sri Lanka's tea output is produced by smallholders—farmers cultivating less than 10 acres of land, often relying on informal labor and family involvement (ILO, 2018).

Smallholder Realities

From personal experience within a tea smallholder family, it is evident that direct family labor is most common on plots under two acres. Larger holdings typically depend on informal labor sourced from nearby villages. This grassroots workforce forms the backbone of Sri Lanka's rural economy and contributes significantly to national export earnings.

Fertilizer Policy Shift and Its Consequences

On May 6, 2021, the Sri Lankan government abruptly banned the import of chemical fertilizers, citing health and environmental concerns. The policy aimed to save approximately US$400 million annually in foreign exchange (Economy-Next, 2021). However, the transition to organic fertilizer was poorly planned and executed, triggering widespread disruption.The abrupt shift in 2021 from chemical to organic fertilizers, followed by inconsistent policy reversals, has led to confusion, reduced yields, and declining interest in fertilizer use.

In a partial reversal, the Sri Lanka Tea Board later announced that chemical fertilizers would be reintroduced under a licensing and monitoring system, emphasizing that this would be a temporary measure (Daily Mirror, 2021). Despite this, the damage had already begun to unfold.

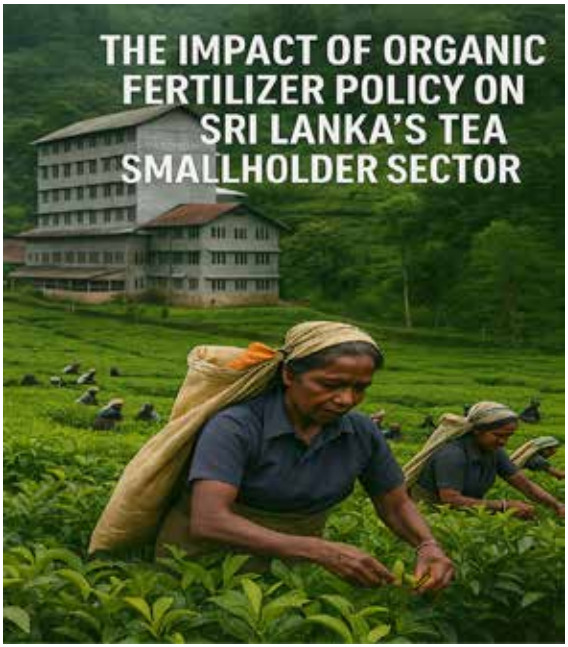
Technical Challenges

Tea cultivation is highly dependent on nutrient-rich soil. Chemical fertilizers especially nitrogen, phosphate, and potash have long been essential to maintaining productivity. The sudden shift to organic alternatives,

which often contain only 2% nitrogen, proved inadequate for sustaining yields.

Smallholders reported that:

- Organic compost was expensive (Rs. 900 per 40kg bag), requiring up to Rs. 7,200 per acre, compared to Rs. 4,500 for chemical fertilizer.
- Compost quality was inconsistent and often failed to meet Tea Research Institute (TRI) standards.
- Fertilizer quotas were tied to leaf output, creating a vicious cycle of declining yields and reduced access to inputs.



Economic Impact

The supply chain comprising farmers, pluckers, intermediaries, and factories has been severely affected. Interviews with workers and smallholders reveal: Crops have declined by about 50%. We used to work every five days, now it's every 10–12 days. Our income has halved."-Worker, Matara (18 August 2021)

The tea bushes are yellow. They produce single leaves. The taste and quality are gone. Tea is our livelihood. Fertilizer shortages hurt us more than Covid."
Smallholder, Matara (05 September 2021)

The ripple effects include:

- Reduced plucking frequency and lower wages for laborers
- Declining factory throughput and profitability
- Erosion of smallholder capacity to maintain tea lands

By 2025, 225 tea factories shut down due to insufficient leaf supply and rising costs.

Social Vulnerability

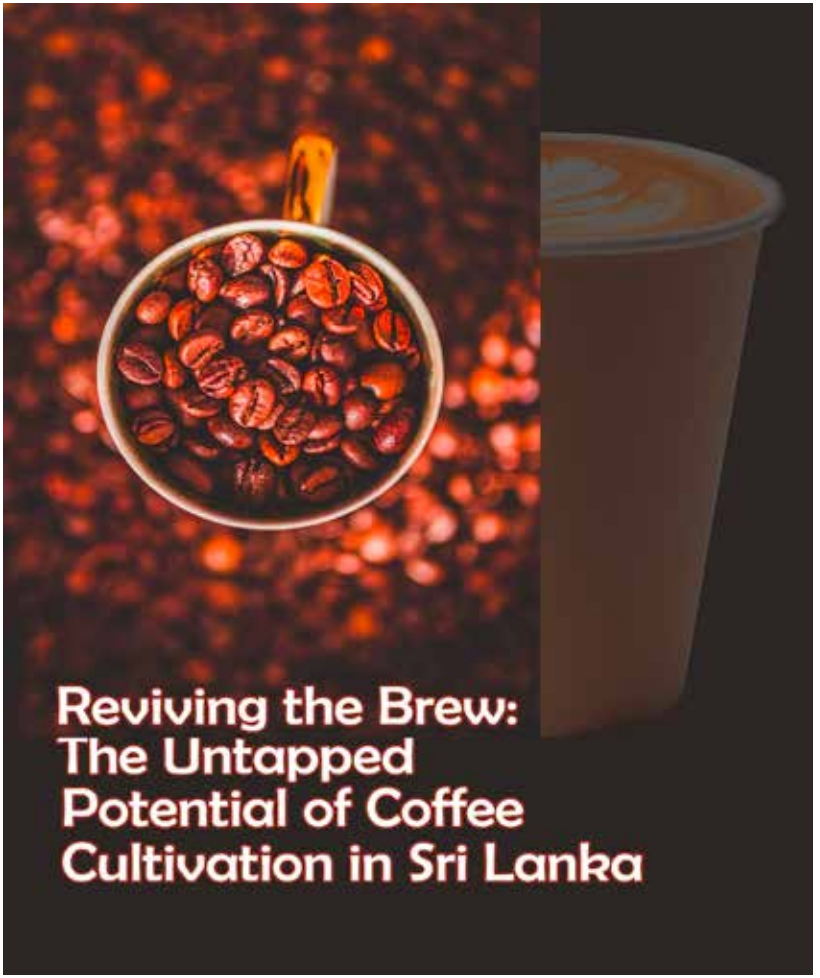
The collapse of the rural tea economy has intensified social and economic vulnerability:

- Families dependent on tea income face food insecurity and debt
- Migration from rural areas is increasing
- Informal laborers are losing stable employment

Recommendations

To stabilize the sector and restore confidence:

- Gradual transition to organic practices with TRI-certified inputs
- Subsidies and price controls to make fertilizer affordable
- Training programs for smallholders on soil health and composting
- Transparent distribution systems to prevent black-market exploitation
- Monitoring and feedback loops to assess policy impact.



Asitha De Costa

A Global Beverage with Deep Roots

Coffee is the most widely consumed beverages in the world, second only to water. With a rich global history dating back to the 15th century in Ethiopia and Yemen, it has evolved into a multibillion-dollar industry, commanding influence across continents.

Today, coffee is not just a drink; it's a global culture, a livelihood for millions, and a rapidly expanding investment opportunity.

Sri Lanka's Forgotten Coffee Legacy

Few remember that before tea made Ceylon famous, coffee was the country's leading export. Introduced by the Dutch and later expanded under British rule, Sri Lanka's central highlands thrived with Arabica coffee plantations. At its peak in the mid-1800s, the island was one of the world's largest coffee exporters & have had more than 110,000 Ha. in bearing. However, the outbreak of the devastating coffee leaf rust (Hemileia vastatrix) in the 1870s decimated plantations. Lacking resistant varieties and technical knowledge, the British pivoted to tea cultivation, a decision that reshaped the island's agricultural future. But now, over a century later, coffee is reemerging with renewed promise.

Coffee Varieties and Agro Climatic Needs

- Grows best in high elevations (above 1000m), with cooler climates and rich soil conditions ideally found in Sri Lanka's upcountry regions such as Nuwara Eliya, Badulla, Kandy, and Matale.

Arabica vs. Robusta: A Comprehensive Comparison		
Feature	**Coffea arabica (Arabica)**	**Coffea canephora (Robusta)**
Altitude & Climate Requirements	Grows best at high elevations (1,000–2,200 meters above sea level). Prefers cool temperatures (15–24°C), consistent rainfall, and rich, well-drained volcanic or loamy soil.	Thrives in lower altitudes (0–800 meters), tolerates higher temperatures (24–30°C), and can grow in harsher, more humid environments with less soil quality.
Bean Shape & Appearance	Oval-shaped beans with a curved crease. Generally larger and flatter with a more refined appearance.	Rounder, smaller beans with a straight crease. Denser and more robust in physical structure.
Taste & Flavor Profile	Known for its complex flavor, mild acidity, smooth body, and aromatic nuances. Often described as sweet, fruity, floral, chocolaty, or winey, depending on terroir and processing.	Offers a bolder, more bitter taste with earthy, woody, and nutty notes. Lacks acidity and subtle aroma, often perceived as more astringent or harsh.
Caffeine Content	Contains about 0.8% to 1.4% caffeine per bean. Lower caffeine contributes to its smoother, more refined taste.	Contains about 1.7% to 2.7% caffeine per bean—almost twice that of Arabica. This gives Robusta its stronger, more bitter taste and natural pest resistance.
Disease & Pest Resistance	More susceptible to pests, fungal infections (e.g., coffee leaf rust), and environmental stresses. Requires attentive cultivation and ideal conditions.	Highly resistant to pests and diseases, especially coffee leaf rust. More tolerant of drought and temperature variations.
Global Market Share	Accounts for around 60–70% of global coffee production. Sought after by specialty roasters and premium brands.	Makes up 30–40% of global production. Commonly used in instant coffee, espresso blends, and mass-market roasts.

Summery

Arabica is the gold standard in the specialty coffee industry valued for its superior flavor, delicate aromas, and smooth finish. It is best suited for high-end markets, cafés, and roasters that emphasize terroir and origin traceability. Therefore, over **60% of the global coffee market** is dominated by Arabica, making it the prime candidate for Sri Lanka's revival efforts in suitable terrain.

Current Global Demand and Market Trends

As of 2024, global coffee consumption exceeds 10 million metric tons annually, valued at over USD 120 billion, and continues to grow steadily. With rising interest in premium, single-origin, and sustainably farmed coffees, small-origin producers like Sri Lanka are gaining attention. Trends indicate:

- Increased demand for Arabica specialty coffees.
- Rising per capita consumption in Asia-Pacific and Middle East.
- Growth in organic and traceable coffee exports.
- Expansion of boutique coffee brands and artisanal roasters.

Sri Lanka's Positioning:

Sri Lanka's central highlands (e.g., Nuwara Eliya, Badulla, Matale, Kandy) provide ideal conditions for cultivating high-quality Arabica, enabling the country to compete in niche, high-value markets.
Robusta, while not a national focus due to elevation constraints, may still be suitable for select lowland regions or intercropping systems.

Comparative Advantage:

Cost and Climate
From an investor's viewpoint, coffee offers compelling advantages over most of the plantation crops:

- Lower establishment costs than tea
- Lower ongoing cost of production, with fewer labour inputs
- Faster gestation (first harvest from 2- to 3 years, full bearing from 5 years onward)
- Suitable for intercropping, enhancing land-use efficiency
- Requires less frequent pruning and plucking cycles than tea.

Moreover, many upcountry tea lands, especially those with declining productivity or steep terrain, are better suited for coffee cultivation, particularly Arabica, given the similar elevation and soil conditions.

Current Coffee Cultivation in Sri Lanka

Today, Sri Lanka cultivates approximately 4,000–5,000 Ha. of Arabica coffee, mostly under smallholder systems. However, there's renewed interest among Regional Plantation Companies (RPCs) and private investors. Notable companies involved include:

- Hatton Plantations PLC
- Kelani Valley Plantations Plc
- Elpitiya Plantations Plc
- Horana Plantations Plc
- Kahawatte Plantations Plc
- Maskeliya Plantations plc
- White & Co- owners of Merigold estate- Ragala
- Temple Grounds Coffee

Department of Export Agricultures' Role in Coffee Cultivation in Sri lanka

In Sri Lanka, the Department of Export Agriculture (DEA) plays a pivotal and multifaceted role in revitalizing and supporting the coffee sector.

Through its structured programs and field-level interventions, the DEA acts as a catalyst for sustainable growth in coffee cultivation.

Key areas of support include:

- Provision of High-Quality Planting Material:
- The DEA ensures the availability and distribution of improved coffee varieties that are both high-yielding and resistant to leaf rust and other common diseases. This helps enhance productivity while reducing the risk of crop failure.
- Capacity Building and Field Advisory Services:
- Farmers receive continuous technical guidance through training sessions, demonstrations, and on-site advisory services. These efforts are aimed at improving agronomic practices, pest and disease management, and post-harvest handling techniques.
- Financial Assistance and Incentives:
- To encourage replanting and area expansion, the DEA facilitates access to subsidies and soft loans. This financial support is crucial in reducing the economic burden on growers and stimulating long-term investment in coffee farming.
- Promotion of Sustainable and Export-Compliant Practices:
- In response to increasing global demand for sustainably sourced produce,
- the DEA actively promotes organic cultivation and Good Agricultural Practices (GAP). These initiatives help farmers align with international quality standards, thereby improving market access and export potential.

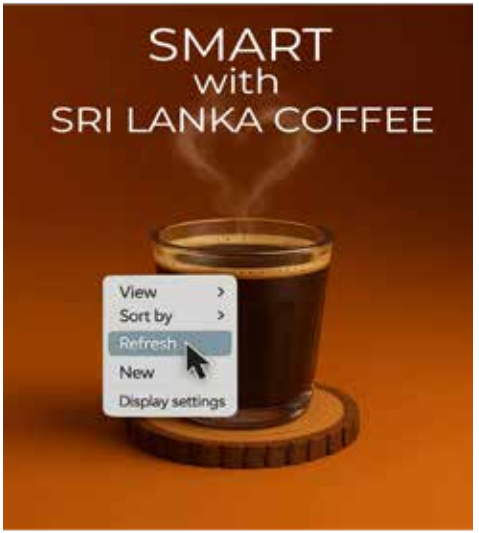
In recent years, several Sri Lankan companies have taken significant strides in the coffee value chain by establishing their own state-of-the-art roasting facilities and launching distinctive Arabica coffee brands. These pioneering enterprises are not only elevating the profile of Sri Lankan coffee but also gaining international recognition for their commitment to quality, sustainability, and the unique terroir of the island's central highlands.

These brands emphasize traceability from farm to cup, uphold ethical sourcing standards, and incorporate refined roasting techniques that highlight the delicate flavor notes of high-grown Arabica beans.

As a result, they are fast becoming ambassadors of Sri Lanka's re-emerging coffee culture on the global stage. Leading Sri Lankan Arabica Brands and Roasters include:

- Temple Grounds Coffee
- Damn Fine Coffee
- Soul Coffee
- Tusker Coffee
- Helanta Coffee
- Abba Coffee roasters
- Uva Mountain Coffee
- Toscana Ceylon Coffee
- Arabica by Thadula
- Ruby Harvest by Whight & Co. Coffee

These brands are helping position Sri Lanka within the specialty coffee segment, where quality, origin story, and sustainability command premium pricing. As demand for boutique, traceable coffees grows globally, these names are defining the new face of Sri Lankan Arabica.



Strategic Importance for Sri Lanka

If cultivated on a mass scale, coffee has the potential to:

- Generate foreign exchange earnings through high-value exports
- Rehabilitate abandoned or underperforming tea lands
- Enhance climate resilience and promote agroforestry systems.
- Provide livelihoods and rural employment, especially for smallholder communities
- Create value-added industries (roasting, packaging, export branding)
- Furthermore, as climate change challenges traditional tea zones, coffee becomes a sustainable, climate smart alternative.

Looking Ahead: The Future of Coffee in Sri Lanka

Over the next 20 to 30 years, global demand for coffee is projected to rise by 30–40%. Specialty coffees, in particular, are expected to dominate growth. If Sri Lanka positions itself effectively, it could become a boutique origin for premium Arabica, much like Ethiopia, Colombia, or Jamaica.

For investors, the opportunities are substantial:

- High-return export potential
- Growing domestic market (especially with rising café culture)
- Low entry barriers compared to perennial crops like rubber or coconut
- Government and institutional support

With the right combination of policy backing, private investment, and agronomic innovation, Sri Lanka can reclaim its lost legacy and write a new chapter as a premium coffee-producing nation.By investing in coffee today, we invest in a sustainable, profitable, and climate-resilient future for Sri Lanka.

Social impact of coffee in Sri Lanka society

A large portion of Sri Lanka's coffee comes from smallholder farmers in rural areas. Investments in sustainable coffee production and the specialty sector directly translate to increased incomes for these farmers, as seen with over 2,400 farmers benefitting from new opportunities and higher earnings.

Foreign Earnings and Economic Stability:

By aligning its coffee sector with international market demands and focusing on value-added products, Sri Lanka can increase foreign earnings, which is crucial for its economic stability, especially considering its alignment with the European Union's market for specialty coffee.

Tourism Linkage:

The thriving coffee sector, with its growing number of cafes and a focus on high-quality products, links to the tourism industry, creating a synergy that benefits both sectors.

Sri Lanka's Road to Carbon Neutrality

Niroshana Ilangaratne

Introduction

As the climate crisis intensifies, countries around the globe are working toward a carbon-neutral future. Sri Lanka has joined this global mission with a bold commitment to achieve **carbon neutrality by 2050,** in line with the **Paris Agreement** and the goal of limiting global warming to **1.5°C.**
This article explores what carbon neutrality means, where Sri Lanka stands today, the technologies supporting this transition such as **pumped storage hydro** and how each of us, as individuals or communities, can contribute meaningfully.

What is Carbon Neutrality?

Carbon neutrality (or net-zero emissions) means balancing the amount of carbon dioxide (CO2) we emit into the atmosphere with an equivalent amount removed or offset through:

- **Natural absorption** (e.g., forests),
- **Technology** (e.g., carbon capture), or
- **Offsets** (e.g., renewable energy projects).

Achieving net-zero is crucial to avoid catastrophic impacts like rising sea levels, extreme weather, and food insecurity.

Sri Lanka's Climate Commitments

In 2021, Sri Lanka updated its Nationally Determined Contributions (NDCs) with the following key targets:

- Reduce GHG emissions by 14.5% below Business As Usual (BAU) by 2030: o4% Unconditional 10.5% Conditional (with international support)
- Achieve 70% renewable electricity generation by 2030
- ncrease forest cover to 32% by 2030
- Reach carbon neutrality by 2050

Explaining the Emission Reduction Target

Let's break down the key commitment:

"14.5% reduction below Business As Usual (BAU), with 4% unconditional and 10.5% conditional on international support."

Term	Meaning
Business As Usual (BAU)	The expected emissions by 2030 if no new climate action is taken.
14.5% Reduction	Sri Lanka aims to cut emissions 14.5% below that BAU level.
4% Unconditional	Sri Lanka will reduce 4% using its own resources and capabilities.
10.5% Conditional	This part depends on international support like finance, technology, and capacity building.

Example:

If projected BAU emissions in 2030 are 50 million tons CO2e:
A 14.5% cut = 7.25 million tons reduction.Of that:

- o2 million tons (4%) will be reduced unconditionally.
- o5.25 million tons (10.5%) can be reduced only if global partners assist.

Where Does Sri Lanka Stand Now?

Progress So Far

- In 2017, GHG emissions were estimated at 38.2 MtCO2e.
- In June 2024, a major Electricity Act was passed to modernize the power sector and attract renewable energy investments
- A 120 MW solar project was launched with Indian assistance.
- Construction is underway for a 600 MW pumped hydro project (Maha Oya).
- Efforts are in place to connect Sri Lanka's grid with India to enhance clean energy trade.

Challenges

- Emissions are still rising; Sri Lanka is not yet on track for a 1.5°C-aligned pathway.
- Political challenges, like the revoked wind power deal in early 2025, slow down momentum.
- Dependence on fossil fuels (especially for transport and thermal power) remains high.
- Climate finance access is limited, affecting large scale renewable rollouts and adaptation.

The Role of Society

Sri Lanka's transition to carbon neutrality needs every sector and citizen to get involved. Here's how:

As Individuals:

- Reduce energy use at home and opt for solar power.
- Use public transport, walk, or cycle.
- Switch to clean cooking stoves and reduce waste.
- Support local, eco-friendly products.

As Communities & Organizations:

- Organize tree-planting drives and clean-up campaigns.
- Promote climate education in schools and workplaces.
- Shift office operations to green practices (digital workflows, less plastic, more efficiency).

As Policy Advocates:

- Support renewable energy and environmental protection laws.
- Hold institutions accountable for sustainability performance.
- Participate in climate dialogues and community consultations.
-

Conclusion

Sri Lanka's carbon neutrality goal by 2050 is both visionary and achievable, but it demands a united national effort rooted in policy, innovation, and collective responsibility.

Progress is visible: reforms are in place, projects are underway, and public interest is growing. Yet, the challenges are real climate change is not waiting.

With stronger implementation, global cooperation, and peoplepowered change, Sri Lanka can lead by example in building a greener, safer future for generations to come.

Concept for TEA KIDS Hybrid Preschool

Achini Weerasinghe

We were delighted to share the exciting news that it had been decided to launch the first preschool at Pedro Estate, a pioneering initiative within the RPC. This bold decision marked a significant step forward in community development and demonstrated a profound commitment to the well-being of employees and their families.

The journey of national development had brought progress to many sectors, yet the plantation community continued to progress at a slower pace. Despite these challenges, there was a growing desire among plantation residents to transform their lives and secure a better future for the next generation.

The Plantation Human Development Trust (PHDT), as the key organization tasked with improving the well-being of these communities, recognizes the critical role that education plays in long-term development.

For many parents, their greatest ambition is to see their children thrive and quality early childhood education is the foundation for that vision.

While the concept of crèches is not new, today's families are seeking modern, nurturing, and affordable learning environments for their young children. In response, PHDT has developed an innovative approach to early childhood care that aligns with contemporary needs and supports the holistic development of children in the plantation sector.

Educational Philosophy and Approach

The preschool catered to children aged 3 to 6 years, offering a nurturing environment designed to support their early learning and development. The centre accommodated up to 40 children, providing age-appropriate learning facilities and services that aligned with the developmental needs of this age group.

The project is funded by the Hemas Outreach Foundation, and the monitoring partners were the Ministry of Plantation and Community Infrastructure and the Ministry of Women and Child Affairs. Implementation and sustainability is the responsibility of the PHDT along with the RPC.

An investment of Rs. 15 million was made under Phase 1 to complete construction and develop the play area as well. The preschool curriculum was developed around theme-based lesson plans that followed the guidelines of Early Childhood Care and Development (ECCD). The focus is on activity-based learning, where children engaged in playful, hands-on experiences that fostered holistic development, including cognitive growth.

Learning through play is the cornerstone of the preschool's educational approach, helping children develop important life skills in a natural and enjoyable way. The centre is also inclusive, welcoming all children living on the estate, including children with special needs as well as those from the surrounding areas. Activities are tailored to suit their unique abilities, ensuring that every child receive the appropriate level of support and engagement throughout their learning journey.
Management responsibilities:

Due to the high cost of maintenance, we are permitting you to build up a revolving fund so that sustainability of this project will not be a burdened to the company. Whenever necessary you could make contribution as this centre would continue to be under your authority

To ensure the long-term sustainability of the project and to minimize the financial burden on the company, approval has been granted to establish a revolving fund. This fund will support the ongoing maintenance and operational costs of the centre. Contributions may be made as needed, enabling the centre to continue functioning effectively under the authority and guidance of the estate management."

Hybrid TEA KIDs Preschool:

Hybrid TEA KIDS Preschools is a unique model, integrating the rich heritage of our tea estate with the innovative approach of early childhood education.

Estate management will play an active and vital role in the preschool's operations, ensuring a harmonious blend of tradition and modernity. The operations will continue with the usual CDC (Child Development Centre) practices, providing comprehensive care and education for infants, toddlers, and preschoolers. With a strong focus on Early Childhood Development (ECD), Hybrid TEA KIDS Preschools will offer a nurturing environment that fosters growth, learning, and exploration.

Management responsibilities:

Preschool teacher and staffing structure: We propose utilizing the existing Child Development Officer (CDO) for the role of preschool teacher at Hybrid TEA KIDS Preschools, provided she is suitable for the position. We will offer additional training to enhance her capabilities. The Regional Plantation Companies (RPC) may consider offering an additional allowance if she proves to be a good fit for the role.

These hybrid centers will require qualified teachers. We believe that assigning the existing CDOs to this role will motivate them and contribute positively to organizational growth. Their salaries will continue to be paid by the estate management. To ensure the smooth operation of the preschool, we recommend hiring two additional assistants to help care for infants and toddlers. This will prevent the teachers from being overwhelmed and ensure that the quality of care for infants and toddlers is maintained. Each assistant will receive proper training, and a recommended salary of around Rs 25,000/-. We will explore the development of a revolving fund to support these initiatives. Additionally, children and teachers were provided with suitable uniforms to create a cohesive and professional environment. The Hybrid TEA KIDS Preschools will continue with the usual Child CDC practices, providing comprehensive care and learning facilities for infants, toddlers, and preschoolers. With a strong focus on Early Childhood Development (ECD), we aim to create a nurturing environment that fosters growth, learning, and exploration.

The Hybrid TEA KIDS Preschools will be staffed by qualified and dedicated educators to ensure the highest standards of early childhood care and education. It is proposed that the existing Child Development Officers (CDOs) be assigned to the role of preschool teachers, as this will both motivate them and contribute positively to organizational growth. Their salaries will continue to be covered by the estate management.

To support smooth day-to-day operations and maintain the quality of care for infants and toddlers, two additional assistants will be recruited. These assistants will receive proper training to equip them with the necessary skills, with a recommended monthly salary of approximately Rs. 25,000/-. A revolving fund will be developed to sustain these initiatives and ensure the long-term viability of the centres.

In addition, both children and teachers will be provided with appropriate uniforms to foster a cohesive, professional, and inclusive environment. Continuing the established Child Development Centre (CDC) practices, the Hybrid TEA KIDS Preschools will offer comprehensive care and education for infants, toddlers, and preschoolers. With a strong focus on Early Childhood Development (ECD), these centres are designed to nurture growth, learning, and exploration within a supportive and engaging setting.

Operations cost:

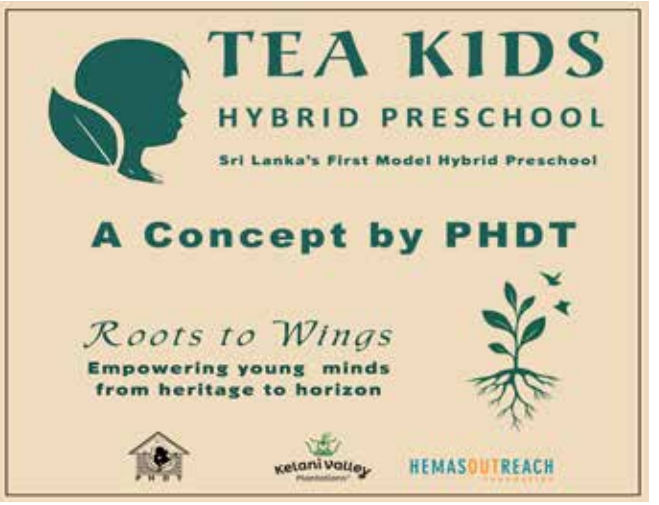
Enhancing Quality Education and Value-Added Services in Plantations, investing in quality education for the children of plantation workers is essential for the industry's future.

Expected out come to the organization:

- Enhanced worker productivity and loyalty.
- Positive reputation and long-term sustainability.
- Access to quality education for workers' children.
- Competitive compensation and recognition for teachers. .
- Increased investment in community development.
- Compliance with CSR regulations and recognition for ethical practices.
- Development of a skilled future workforce.

By offering reasonable school fees and additional allowances for teachers, this initiative aims to increase worker productivity and satisfaction.

1. No Cost Centres: Implementing cost centres are vital for the industry's health and facilitates necessary changes.
2. Value of Quality Education: Parents will appreciate the value of investing in their children's education, which is crucial for community success.
3. Reasonable School Fees: Plantation companies should provide affordable school fees for workers' children, motivating workers to enhance productivity.
4. Nonworkers children could be considered but they need to pay the enrolment fees, deposits and monthly fees as done in any other centres in the island.
5. Additional Allowances for Teachers: Offering extra allowances to teachers ensures the successful operation of educational centres and attracts quality educators.



By implementing this model offers several benefits to the organization is recommended:

- Enhanced Reputation: Demonstrating a commitment to the well-being and education of workers' children can enhance the company's reputation, attracting potential investors and partners.

- Increased Worker Loyalty: Providing valuable services such as education fosters a sense of loyalty and appreciation among workers, reducing turnover rates and associated training costs.

- Higher Productivity: Motivated and satisfied workers are generally more productive, leading to better overall performance and profitability for the company.

- Community Development: Supporting education contributes to the overall development of the community, creating a more stable and supportive environment for the company to operate in.

- Compliance and Recognition: Adopting such initiatives can help the company comply with Corporate Social Responsibility (CSR) regulations and gain recognition for ethical and responsible practices.

- Future Workforce: Investing in the education of workers' children help develop a skilled future workforce that may benefit the company in the long run. These benefits not only improve the immediate working environment but also contribute to the long term sustainability and success of the organization

A sustainability plan will be drawn up through a management committee, with contributions from the Plantation Human Development Trust (PHDT) and you to ensure long-term success and continuous improvement.

A comprehensive sustainability plan will be developed by a management committee, with active contributions from the Plantation Human Development Trust (PHDT) and the RPC, to ensure long-term success and continuous improvement of the project.

Progressive Rehabilitation and Tea Land Sustainability

Dr. Prasad Dharmasena

The tea plant, which is taxonomically identified as "Camellia sinensis", occupies considerable land extent in Sri Lanka as plantations, and its commercial success was legendary, towards the end of the 19th century. A foundation pattern of tea industry in the Island was strategically identical. Large areas of thick forests and jungles at the climactic phase, with soil fertilities and other diversities; were cleared and brought under tea cultivations. This newly introduced plantation model has initiated changes in the natural landscaping system. Consequently there is an immense concern over the sustainability, with current production practices employed and the patterns of resource usage in tea agro-ecosystems such land marginalization and other ecology related issues in tea industry of the Island In view of commercial aims, transformation of natural forests to artificial landscaping system was highly successful within a short span of time. It is evident that tea industry has been playing a significant role in economies of the subcontinent since its establishment. Tea growing area in Sri Lanka is classified in to three major zones based on the different elevation categories called high grown, mid grown, low grown.

Sri Lanka has forged ahead in the world having exported approximately 305 million kg tea per annum, the current foreign exchange earnings from tea sector is approximately USD 1.2billion, which is nearly 14 per cent of the total national foreign exchange income, Earnings from the agriculture sector contributes to about 19.7 per cent of the total GNP, around 70% of which is covered up by tea, while providing approximately 650000 direct job opportunities. Even though, the tea industry has been playing a vital role in the economy in Sri Lanka, the sector has experienced major changes during the last few decades. The issues on tea sector can be broadly divided into the following three categories such as Environment and land degradation, economic and marketing constraints and social and institutional issues which have lead to the productivity declining, economic instability and social/institutional unrest. Environment and land related issues doubled during last few decades due to poor agricultural practices and aging of the plantations As mentioned above, commercial tea plantations were introduced to the region at the end of 19th century where forests and Patna lands were converted to tea estates, thereby stable virgin mountain ecosystem would have been disturbed resulting in sever deterioration of physical, chemical and biological properties of soils. Due to exposure of untouched natural ecosystems to an artificial landscaping system, environmental degradation issues gradually have been developed as results of soil erosion/degradation and soil compaction under tea plantations.

Land degradation has been on the rise in tea plantations during last 150 years in Sri Lanka alike, particularly after the advent of commercial plantation agriculture in mountainous territories planted with tea seeds initially. Soil erosion on tea growing regions is primarily due to non-adoption of proper agricultural practices, poor conservation measures and number of anthropogenic operations since establishment of commercial plantations to the present days.

Further, tea industry of Sri Lanka has lost its' stable agro ecosystem due to large scale degradation of tea lands as well as other productive and protective natural resource bases. It is found that top soils of tea lands are almost denuded and eroded which has resulted in a decline of the productivity of lands. Old seedling tea lands are mainly vulnerable for soil degradation due to water erosion in Sri Lanka. Establishment of favorable soil cover in the vacancies existing in seedling tea fields and diversification with acceptable and suitable species of other land use types in order to mitigate the issue is needed for the long term sustainability of the tea industry in the Island. This damage is aggravated by the natural ambient conditions of particular regions. Tea grown regions are obviously prone to higher precipitation, erodibilty, and having greater slope classes are apparently conducive to detach soil particles by water erosion. The erosive rain storm results in a greater intensity of mean annual metric erosivity index.

Soil erosion is an extensive issue in all tea growing regions in Sri Lanka, but the problem being particularly severe in the mid country where sloping lands have been dominated over by the seedling tea plantations. Number of recent studies discovered that soil erosion/degradation of tea plantations in mid country is fairly higher than in other tea growing regions of the country. This is particularly due to insufficient soil cover. Uva tea growing region is in the most perilous condition and substantially higher abandoned tea lands exist. Mid country as a major tea growing region has been recorded the lowest productivity in the country due to poor condition of tea fields and agro ecological conditions.

The factor affecting the productivity decline and land marginalization is the decline of soil's nutrient status, and is identified as the cumulative effect of soil erosion due to both insufficient soil cover of seedling tea fields and improper land care. There are around 34400 ha of poorly managed seedling tea in mid country elevation category. Soil loss of these lands is estimated as 75tons/ha/yr . These lands would be diversified in to mix cropping systems as a remedial measure to reduce ecological instability and to make the lands economically profitable in order to secure employments opportunities of plantation community inclusive of large and small scales.Agroforestry as a sustainable land management technology to diversify and/ or develop poorly managed tea lands, potentially provides support for minimizing of land related issues through simultaneous production of food, fodder and firewood; as well as mitigation of the impact of soil erosion, climate change and other agro ecological issues . Agroforestry systems can't be referred by a unique definition, design or a specific model for a particular degraded tea land has to be considered according to the situation, depending on the variables. Agroforestry models, particularly for the marginal tea plantations with less soil cover of the mid country of Sri Lanka, is designed to build up an ideal vegetation cover intercropping,

with nitrogen fixing trees for controlling soil erosion and land degradation which in turn help to maintain a stable agro ecosystem in the vicinity. This has to be given priority as the existing soil cover of poorly managed tea plantations are hardly above 40% in the mid country of Sri Lanka. Other land use types of the estates also require immediate rehabilitation actions for mitigating adverse ecological issues. Hence, agroforestry practices in these land use types should be a compulsory remedy in order to maintain stable plantation agro ecosystems and also the economic stability for institutional and social upkeep.

Impacts on tea agro ecosystems through optimally established shade trees in tea plantations are positively high and well organized shade trees practice is recognized as a commercial agroforestry system. It also contributes to enhance the soil fertility through litter falling and mulching with lopped branches; thereby, reducing the erosion wide changing the physical properties of the soils. Main objectives of applying agroforestry systems to other land use types such as barren lands, road side/banks and unutilized lands belonging to tea estates, is for restoration of degraded lands and maintenance of soil fertility on one hand and enhancement of aesthetic values to bring in economic benefits on the other. Establishment of agroforestry systems integrated with nitrogen fixing trees would provide complete soil protection against land degradation, while bringing economic stability and social acceptability. Purposes behind the utilization of marginal tea lands for agroforestry are mainly of two types. Firstly, development of existing low productive lands – Low productive lands can be developed by introducing suitable species (tea, shade tree and/or other suitable export crops) to vacancies prevailing in the fields in order to build up favorable soil cover, while enhancing the socioeconomic potential of the land. Secoundly, diversification of abandoned lands, are suitable for diversifying into appropriate agroforestry Systems/models. Models/structures of diversification would be dependent on the degraded lands' condition such as the gradient, elevation, existing vegetation type, vegetation history.....etc. If the lands are unsuitable to be developed for tea replanting or infilling of vacancies or other seasonal/export agricultural crops due to geographical constraints, requirement of the users and legal barriers....etc. Those lands could also be recommended for commercial or conservation forestry systems. Other degraded lands chosen could be diversified into mix cropping systems, intercropping models on the basis of requirements and suitability of the lands. Home garden systems, live fences/wind break systems are also shown high potential for diversification, thus, on the availability and type of marginalized condition, lands could be diverted in to agro forests as considered suitability.

Agroforestry systems employed in marginal tea lands could be of two designs as mentioned. Any agroforestry system adopted should be able to fulfill the estates' needs by a balance being struck between the productive.

and protective parameters of the land. One of major objectives of agroforestry applications is to provide mulches in order to enrich soil fertility while preventing soil erosion by either development of existing lands or diversification of abandoned lands. Role of nitrogen fixing trees could be enormous in mulch/fodder productions. Practicing of export agricultural crops is to enhance users' economic stability as well as social expectations of the plantations community. Provision of estates' fuel wood requirement is another important benefit from agroforestry systems practiced in tea estates. Aesthetic values and a number of ecological, economic and social/institutional benefits also are met by the application of agroforestry systems in the estates.

Greening the Plantations: Can Payments for Ecosystem Services (PES) Drive Environmental Conservation in Sri Lanka?

Mandakini Amarasinghe

Plantations at a Crossroads

Sri Lanka's plantations tea, rubber, and coconut have long stood as proud pillars of the economy. These green landscapes are not just sources of export revenue; they are also guardians of water, soil, and biodiversity. Yet, beneath their lush appearance lies a more troubling story. Years of intensive monoculture, heavy chemical inputs, and deforestation have led to eroded hillsides, polluted waterways, shrinking wildlife habitats, and degraded catchments. With climate change adding new pressures, the time has come to rethink how plantations can sustain both livelihoods and landscapes. One emerging idea is the use of Payments for Ecosystem Services (PES), a tool that turns conservation into an economic opportunity.

What Exactly is PES?

At its core, PES is simple: those who benefit from nature pay those who manage it.

Ecosystem services such as clean water, fertile soil, carbon storage, and scenic beauty have immense value, yet they are rarely accounted for in financial terms. Plantations, which cover vast areas of Sri Lanka's highlands and lowlands,

play a decisive role in either safeguarding or degrading these services. By introducing PES schemes, plantation owners and workers could be rewarded for adopting environmentally friendly practices. Imagine a scenario where water utilities or hydropower plants compensate estates for protecting forests in upper catchments that regulate river flows. Or picture international buyers paying premiums for tea and rubber grown under biodiversity-friendly conditions. PES transforms good environmental stewardship from a hidden burden into a visible source of income.

The Promise for Plantations

The opportunities for PES in the plantation sector are wide-ranging. Plantations in the hill country are located in fragile catchments that feed rivers like the Mahaweli, Kelani, and Kalu. By maintaining riparian buffers and reforesting degraded slopes, plantations could help ensure steady water supply and reduced sedimentation downstream. In return, downstream industries and municipalities could share the costs through PES arrangements. Similarly, carbon storage potential in rubber and coconut plantations opens doors to global climate finance. Verified carbon credits could provide new income streams while supporting Sri Lanka's commitments under the Paris Agreement.

Biodiversity conservation presents another frontier. Many plantations still harbor patches of natural forest.that shelter endemic species and support pollinators. PES incentives could encourage companies to conserve these areas,

while eco-labeling and certification could strengthen the international reputation of Sri Lankan plantation products.

A Path Forward

Although challenges exist, PES can still emerge as an effective tool for conservation if introduced with careful planning..A practical starting point would be pilot projects in sensitive catchments such as Maskeliya or the Kelani Valley, where plantation practices directly influence downstream water users. Clear guidelines and supportive policies will help create the right environment,

but success will depend largely on collaboration among plantation companies, local communities, private investors, and conservation partners. To ensure fairness, benefits must be shared so that estate workers and smallholder farmers are included alongside estate companies. Financial stability can be achieved by combining resources from different streams such as international climate finance, corporate social responsibility initiatives, and local contributions rather than relying on a single source. At the same time, the use of modern technologies like drones, satellite monitoring, and community-based reporting can reduce costs and improve transparency, building trust among all stakeholders.

Brewing a Greener Future

Ultimately, PES offers a chance to reimagine Sri Lanka's plantations. Instead of being viewed only as extractive, profit-driven landscapes, they could be repositioned as providers of vital ecosystem services delivering clean water, absorbing carbon, protecting biodiversity, and enhancing rural well-being. This would not diminish their economic role but rather elevate it, aligning production with conservation in a way that strengthens both.

The idea is not without risks, but the potential rewards are far greater. If adopted with vision and fairness, PES could transform every cup of Ceylon tea or every sheet of natural rubber into more than just a commodity. They could become symbols of how Sri Lanka chose to balance economy and ecology, ensuring that the green wealth of its plantations continues to serve both people and nature for generations to come.

Conclusion

Payments for Ecosystem Services offer a chance to rewrite the story of Sri Lanka's plantation sector. Instead of being seen only as extractive landscapes, plantations could emerge as eco-service providersdelivering clean water, carbon storage, and biodiversity protection while still producing world-famous tea and rubber. The road is not simple, but with bold policies and inclusive design, PES could turn every cup of Ceylon tea into more than just an export into a symbol of how an island nation balances economy with ecology.

The Future of Farming AI

Jayanath Gamage

Pushed by many obstacles to achieving desired farming productivity limited land holdings, labor shortages, climate change, environmental issues, and diminishing soil fertility, to name a few, the modern agricultural landscape is evolving, branching out in various innovative directions. Farming has certainly come a long way since hand plows or horse-drawn machinery. Each season brings new technologies designed to improve efficiency and capitalize on the harvest. However, both individual farmers and global agribusinesses often miss out on the opportunities that artificial intelligence in agriculture can offer to their farming methods.

I focus have been on developing innovative systems for quality control, traceability, compliance practices, and more. Now, I will hangout deeper into how new technologies can help your farming business move forward.

Benefits of AI in agriculture

Until recently, using the words AI and agriculture in the same sentence may have seemed like a strange combination. After all, agriculture has been the backbone of human civilization for millenniam, providing sustenance as well as contributing to economic development, while even the most primitive AI only emerged several decades ago. However, innovative ideas are being introduced in every industry, and agriculture is no exception. In recent years, the world has witnessed rapid advancements in agricultural technology, revolutionizing farming practices. These innovations are becoming gradually essential as global challenges such as climate change, population growth together with resource scarcity threaten the sustainability of our food system. Introducing AI solves many challenges and helps to diminish many disadvantages of traditional farming.

Data based decisions

The modern world is all about data. Organizations in the agricultural sector use data to obtain meticulous insights into every detail of the farming process, from understanding each acre of a field to monitoring the entire produce supply chain to gaining deep inputs on yields generation process. AI-powered predictive analytics is already paving the way into agribusinesses. Farmers can gather, then process more data in less time with AI. Furthermore, AI can analyze market demand, forecast prices as well as determine optimal times for sowing and harvesting.

Artificial intelligence in agriculture can help explore the soil health to collect insights, monitor weather conditions, and recommend the application of fertilizer and pesticides. Farm management software boosts production together with profitability, enabling farmers to make better decisions at every stage of the crop cultivation process.

Cost savings

Improving farm yields is a constant goal for farmers. Combined with AI, precision agriculture can help farmers grow more crops with more resources. AI in farming combines the best soil management practices, variable rate technology, and the most effective data management practices to maximize yields while minimizing minimize spending.

Application of AI in agriculture provides farmers with real-time crop insights, helping them to identify which areas need irrigation, fertilization, or pesticide treatment. Innovative farming practices such as vertical agriculture can also increase food production while minimizing resource usage. Resulting in reduced use of herbicides, better harvest quality, higher profits alongside significant cost savings.

Optimizing automated Systems

AI algorithms enable autonomous crop management. When combined with IoT (Internet of Things) sensors that monitor soil moisture levels and weather conditions, algorithms can decide in real-time how much water to provide to crops. An autonomous crop irrigation system is designed to conserve water while promoting sustainable agriculture and farming practices. AI in smart greenhouses optimizes plant growth by automatically adjusting temperature, humidity, and light levels based on real-time data.

Detecting leaks or damage to irrigation systems

AI plays a crucial role in detecting leaks in irrigation systems. By analyzing data, algorithms can identify patterns and anomalies that indicate potential leaks. Machine learning (ML) models can be trained to recognize specific signatures of leaks, such as changes in water flow or pressure. Real-time monitoring and analysis enable early detection, preventing water waste together with potential crop damage.

AI also incorporates weather data alongside crop water requirements to identify areas with excessive water usage. By automating leak detection and providing alerts, AI technology enhances water efficiency helping farmers conserve resources.

Crop and soil monitoring

The wrong combination of nutrients in soil can seriously affect the health and growth of crops. Identifying these nutrients and determining their effects on crop yield with AI allows farmers to easily make the necessary adjustments. While human observation is limited in its accuracy, computer vision models can monitor soil conditions to gather accurate data necessary for combatting crop diseases. This plant science data is then used to determine crop health, predict yields while flagging any particular issues. Plants start AI systems through sensors that detect their growth conditions, triggering automated adjustments to the environment.

In practice, AI in agriculture and farming has been able to accurately track the stages of wheat growth and the ripeness of tomatoes with a degree of speed and accuracy no human can match.

Detecting disease and pests

As well as detecting soil quality and crop growth, computer vision can detect the presence of pests or diseases. This works by using AI in agriculture projects to scan images to find mold, rot, insects, or other threats to crop health. In conjunction with alert systems, this helps farmers to act quickly in order to exterminate pests or isolate crops to prevent the spread of disease.

AI technology in agriculture has been used to detect apple black rot with an accuracy of over 90%. It can also identify insects like flies, bees, moths, etc., with the same degree of accuracy. However, researchers first needed to collect images of these insects to have the necessary size of the training data set to train the algorithm.

What is the future of AI in agriculture?

AI is sure to play an increasingly large role in agriculture and food sustainability over the coming years. Technology has always been at the forefront of agriculture, from primitive tools to irrigation to tractors to AI. Each development has increased efficiency while reducing the challenges of farming.

More importantly, the benefits of AI in agriculture are undeniable. Smart farming tools, intelligent automation, and AI-powered products perform repetitive time-consuming tasks so workers can use their time for more strategic operations that require human judgment. Increasingly affordable computer vision alongside agricultural robotics have the potential to accelerate AI advancement in farming. AI has the tools to address the challenges posed by climate change, environmental concerns, and an increasing demand for food. It will revolutionize modern agriculture by improving efficiency, sustainability, resource allocation on top of real-time monitoring for healthier and higher-quality produce.

However, you can't just buy AI and start using it. AI is not something tangible it's a set of technologies that are automated through programming. In essence, an AI algorithm mimics the way people think it learns first, then solves problems based on data. AI-driven transformation of agriculture will require changes in the industry. Farmers need to be educated and trained in how to use AI-powered solutions.

What does this mean for workers in the agricultural industry? AI is likely to change the role of farmers from manual workers to the planners and overseers of smart agricultural systems. An understanding of IT solutions and agribusiness intelligence will potentially become more useful than the ability to use conventional tools or carry out physical labor.

Despite AI and machine learning together with MLOps services having the potential to radically transform farming, they need other technologies to work in sync. To reap all the benefits of AI, farmers first need a technology infrastructure. It could take years to develop that infrastructure, but doing so could result in a robust,

Future proof technology ecosystem. Understanding how AI works and how best to integrate technical knowledge into real-life processes is vital for maximizing its benefits. That's why partnering with an expert software development team is an excellent first step.

Each must consider how can improve tools, address challenges, and clearly convey the measurable benefits of AI and machine learning. If this can be achieved, the future of AI in agriculture is bound to be fruitful.

The success of human society is essentially dependent on the optimization of its agricultural systems. Traditional farming methods are becoming outdated, need for advanced technological solutions. Worldwide, the impact of automation on industries has always been considerable. Digital technology is now playing a huge role in transforming agriculture, and the impact of artificial intelligence in agriculture is set to be vast.

Looking for ways to implement AI in your farming operations? Let's discuss. Get in touch with our agricultural experts and take the next big step towards a sustainable future.

How to use on sri lankan Plantattion sector

The research focuses on developing an AI-driven system to support farmers by enabling early disease detection, automated quality grading, and predictive market price forecasting. By leveraging advanced technologies like computer vision and neural networks, Pepper Mate offers a comprehensive solution to enhance productivity, ensure quality standards, and empower farmers with actionable insights.

This initiative highlights the potential of AI in agriculture, driving innovation and sustainability in one of Sri Lanka's most significant export industries. Future developments aim to expand the system's capabilities, ensuring continued support for sri Lanka agriclture farmers and contributing to the growth of the agricultural sector.

Sri Lanka's plantation sector is vulnerable to the impacts of climate change, including erratic weather patterns, increased temperature, and changing precipitation levels. AI can assist in climate modeling, allowing farmers to adapt and make informed decisions in response to changing conditions. AI-driven predictive analytics can support the selection of climate-resilient crops, optimize irrigation strategies, and mitigate risks associated with extreme weather events.

analyzing chemical compounds and spectral data to identify flavor profiles, predict consumer preferences, and ensure consistent quality through machine learning. For example, AI can analyze the spectral fingerprints of tea to identify aroma and flavor compounds, while other systems use computer vision to detect defects in tea leaves.

Biodiversity management as a business case

Prof. Sirimal Abeyratne

Few Sri Lankans realize that their island is one of the world's 36 biodiversity hotspots a designation not of pride, but of urgency. Coined by Conservation International, the term refers to regions exceptionally rich in endemic species but facing severe habitat loss. To qualify, a region must host at least 1,500 endemic vascular plant species and have lost over 70% of its original natural vegetation. Sri Lanka meets both criteria.

Despite covering just 2.5% of the Earth's land surface, these hotspots shelter over half of the world's endemic plant species, along with countless unique birds, mammals, reptiles, and amphibians. This ecological richness is under threat, and the implications go far beyond environmental concerns they touch the heart of economics, development, and national competitiveness.

Rethinking natural capital

Traditional economics treats natural resources as "land" a static input in production. But today, biodiversity is recognized as dynamic natural capital: the variation in genes, species, and ecosystems that underpin climate regulation, water purification, soil fertility, and food security. As biodiversity erodes, so does the stock of natural capital essential for human survival and sustainable development.

Human activity whether through direct exploitation or indirect externalities has accelerated biodiversity loss. Yet, for decades, governments and businesses treated biodiversity as someone else's problem. Environmental agencies were tasked with managing it, while the private sector saw it as a regulatory burden. This disconnect has led to a global financing gap: the world spends around $143 billion annually on biodiversity, just 17% of the estimated $824 billion needed.

Financing the future

Recognizing this gap, the UNDP launched its global Biodiversity Finance Initiative (BIOFIN) in 2012. Its goal: to mobilize funding from all possible sources not just governments to meet national and global biodiversity targets.

BIOFIN reframes biodiversity spending as investment, not cost. It's about generating returns economic, social, and ecological. Sri Lanka is among 135 countries implementing BIOFIN, alongside regional peers like India, Nepal, Bhutan, Malaysia, Thailand, Philippines and Indonesia.

The initiative promotes four strategic approaches to close the financing gap:

1. Avoiding Future Costs: Investing in biodiversity today reduces future environmental expenditures. For example, integrating sustainability into business models can prevent costly restoration efforts later .
2. .Enhancing Efficiency: Improving the effectiveness and synergy of existing spending can yield better biodiversity outcomes without increasing budgets. Re-aligning Current Expenditure: Redirecting
3. existing funds to reduce negative impacts or enhance positive ones for instance, adjusting agricultural subsidies to support eco-friendly practices.
4. Mobilizing New Resources: Tapping into private capital, green bonds, and blended finance mechanisms to supplement government budgets.

A business case for all

Investing in biodiversity is no longer a niche concern it's a strategic imperative for governments, businesses, communities, and nations.

- For Governments: With limited fiscal space, biodiversity investment bridges the gap between policy ambition and budgetary feasibility. Innovative finance mechanisms ease capacity constraints and unlock co-benefits across sectors.
- For Businesses: Biodiversity is a competitive asset. Firms that embed sustainability into their operations gain access to premium markets, meet international standards, and enhance brand value. It's not just compliance it's profitability.
- For Communities: Biodiversity supports livelihoods, health, and cultural identity. Investing in nature ensures clean air, fertile soil, and resilient ecosystems for current and future generations.

- For the Nation: Biodiversity conservation safeguards Sri Lanka's natural capital, reduces ecological depreciation, and sustains long-term growth. It's a foundation for inclusive development and global relevance.

Sri Lanka's opportunity

As a biodiversity hotspot, Sri Lanka faces both risk and responsibility. The depletion of its natural capital threatens economic resilience, food security, and climate adaptation. But it also presents a unique opportunity to lead in biodiversity finance, policy innovation, and sustainable development.
BIOFIN offers a framework to integrate biodiversity into national planning, fiscal policy, and private sector strategy. It aligns with global trends where consumers demand sustainable products, investors seek green portfolios, and international markets reward environmental stewardship. For Sri Lanka, the path forward lies in mainstreaming biodiversity into its development agenda not as a peripheral concern, but as a central pillar of prosperity.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