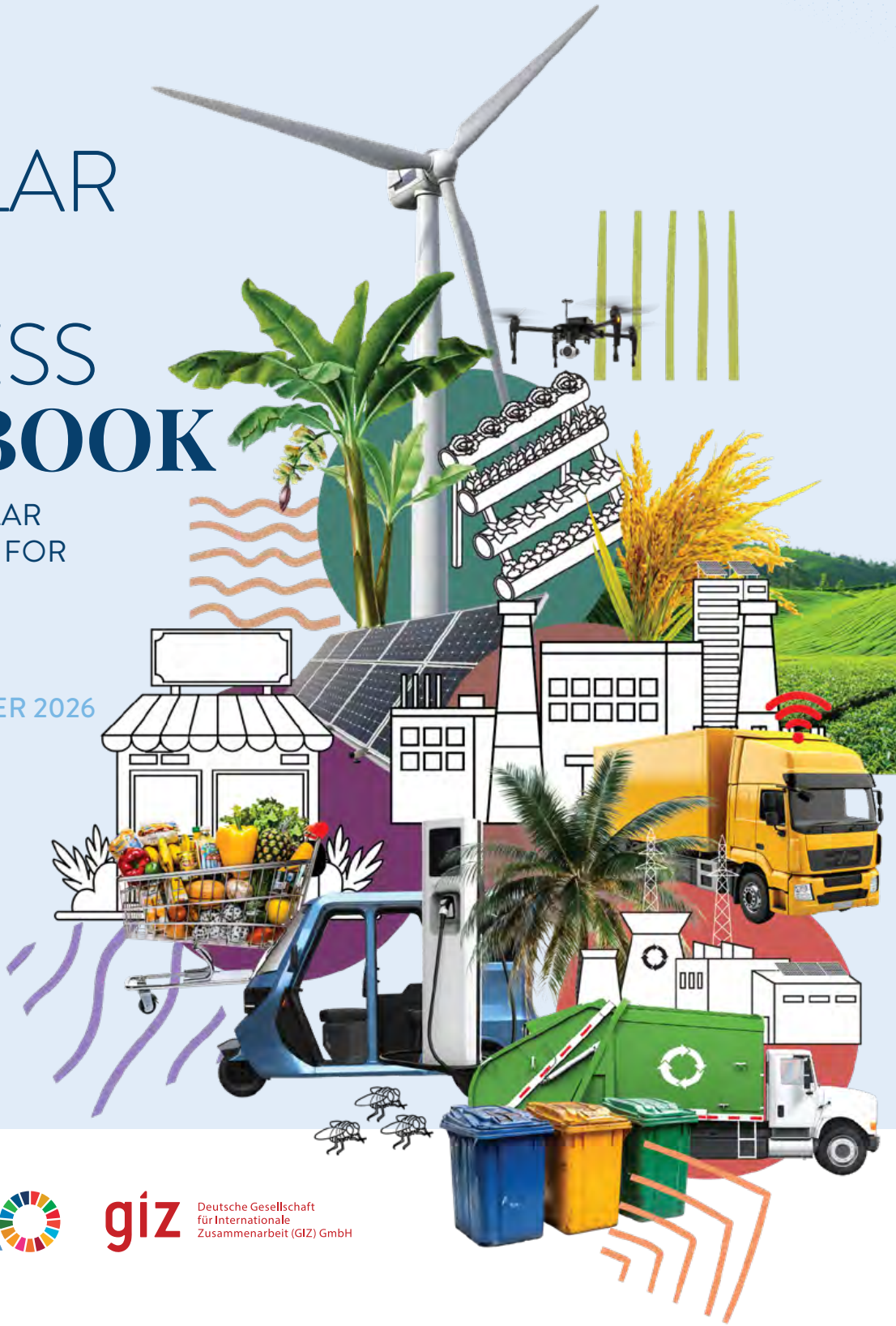
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CIRCULAR FOOD BUSINESS HANDBOOK

REPLICABLE CIRCULAR ECONOMY MODELS FOR PROFITABILITY AND SUSTAINABILITY

SRI LANKA | NOVEMBER 2026



EXPERTISE FRANCE
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About the Handbook

In line with the European Union's commitment to a green transition, the "Circular Economy in the Food Sector (CIRCULAR)" is a three year project funded by the EU and jointly implemented by Expertise France (EF), the Food and Agriculture Organization of the United Nations (FAO) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the latter being partly co-funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). The overall objective of the CIRCULAR project is to promote a Circular Economy approach in the food sector, while increasing resilience to food crises and climate change.

This Handbook was designed as part of Expertise France's contribution under project outcome 2, which aims to promote sustainable production and consumption models, output 2.3 specifically to contribute to MSMEs, startups, social enterprises, cooperatives having increased Access to Finance and Business Development Support related to sustainable and gender sensitive business models and practices.

During the diagnostic conducted by the CIRCULAR project to assess the Sri Lankan Circular Economy financing ecosystem, a consistent pattern emerged across financial institutions. While awareness of sustainability concepts was present, familiarity with commercially viable Circular Economy Business Models was limited and often narrowly interpreted as recycling. This perception significantly hinders capital allocation to commercially sound circular businesses. The absence of practical examples demonstrating profitability, cash-flow performance, asset structures, and scalability further contributes to this perceived risk. This Handbook has been developed to bridge that gap.

The Circular Food Business Handbook presents real examples of 32 Circular food businesses in Sri Lanka through a financial lens. It provides financial institutions, investors, and businesses with insights into operational models, revenue and cost structures, and financing approaches for circular projects. The Handbook aims to build confidence among financiers to identify bankable Circular Economy opportunities across the agri-food value chain, enabling informed decisions on long term, sustainable, and scalable investments.

Methodology

The development of the Circular Food Business Handbook followed a structured, evidence based, and multi stage research methodology designed to ensure practical relevance and applicability within the Sri Lankan food sector.

The study commenced with an extensive review of global and national literature, policy frameworks, sustainability strategies, regulatory mechanisms, and existing research related to Circular Economy implementation within food systems. This review provided the conceptual foundation for the study and informed the development of the research framework.

To understand what investors look for when funding businesses, discussions were held with stakeholders who regularly work with investment and financing decisions. Their feedback helped develop the data collection questionnaire, which was later reviewed and improved by the project team. Potential Circular Economy Business Models across the Sri Lankan food value chain were identified through desk research, organisational websites, industry networks, and sector knowledge. These initiatives were mapped and assessed for relevance. Organisations were then contacted, and case studies were selected based on their willingness to participate, availability of information, and informed consent.

Data collection was conducted between January and May 2026 using a combination of questionnaires, semi-structured interviews, field visits, and document analysis involving participating businesses and other relevant stakeholders. The selected case studies were further assessed based on their alignment with Circular Economy principles, as well as their replicability, scalability, and practical applicability within the Sri Lankan context. Particular consideration was also given to initiatives that contribute to women's empowerment and rural livelihood development, recognising the important role of inclusive and community-driven approaches in advancing sustainable and resilient food systems.

The shortlisted case studies and intervention typologies were subsequently validated through internal technical reviews and external stakeholder consultations to ensure accuracy, credibility, and practical relevance. The findings were then synthesised into a market-informed framework highlighting Circular Economy practices, financing approaches, enabling factors, and key lessons learned from implementation.

Continuous stakeholder engagement throughout the process ensured that the Handbook remained aligned with industry realities, policy priorities, and the evolving needs of businesses, development partners, and financial institutions.



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Acronyms

BMZ	German Federal Ministry for Economic Cooperation and Development
BSFL	Black Soldier Fly Larvae
CAGR	Cumulative Average Growth Rate
CapEx	Capital Expenditure
COGS	Cost of Goods Sold
CRIWMP	Climate Resilience Integrated Water Management Project
DCF	Discounted Cashflow
EBIT	Earnings Before Interest, Tax
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
ESOP	Employee Share Ownership Plan
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HDFSL	Human Development Foundation of Sri Lanka
KPI	Key Performance Indicators
LKR	Sri Lankan Rupees
MSMEs	Micro, Small and Medium Enterprises
NPV	Net Present Value
OBM	Open Book Management
OPEX	Operating Expenditure
PBT	Profit Before Tax
PPE	Property Plant & Equipment
SDGs	Sustainable Development Goals
SSTB	Stripe – Spreading of Tea Bushes
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WACC	Weighted Average Cost of Capital

Reflections from the authors

Many of the Circular Economy initiatives demonstrated in this Handbook are implemented quietly within communities, often without being formally recognised as Circular Economy practices. Our data collection experience suggests that unlike some larger enterprises, community groups were remarkably open in sharing their experiences, data, and methods, reflecting their commitment to collective learning and impact. For them, sharing their experiences in a Handbook like this is a form of recognition for the silent practices they undertake every day. This highlights the importance of recognising and motivating grassroots innovations and entrepreneurs and the significant social value they create alongside environmental and economic benefits.

Contrary to common assumptions, smaller enterprises and community driven initiatives also often adopt circular models more agilely, driven by the pressures of cost and the lack of capital. In contrast, larger enterprises with complex value chains achieve the greatest success through a phased, step-by-step implementation.

Discussions with these enterprises revealed that successful circular initiatives begin with solving real problems faced by businesses, farmers, and communities. The strongest examples demonstrated an ability to simultaneously improve livelihoods, competitiveness, and resource efficiency while benefiting the environment and society. Their experiences reinforce the importance of designing sustainable solutions that are both practical and economically meaningful from the start.

At the same time, we noted many MSMEs face significant challenges in finding capital, obtaining technical expertise, accessing markets, and establishing or transforming their existing operations into circular practices. While many development funding agencies have played an important role in assisting these enterprises, both businesses and supporting organisations continue to encounter difficulties in accessing finance and market opportunities. Addressing these systemic barriers requires greater collaboration and support from a broad range of stakeholders, including government institutions, financial organisations, development partners, and civil society actors.

The financial and banking sector has a particularly important role to play in enabling the circular transition. Financial institutions should be able to identify not only the financial value generated by circular businesses, but also the broader social and environmental impacts they create. This requires moving beyond traditional investment assessment metrics and embracing more sustainability oriented and circularity embedded measures, many of which are presented throughout this Handbook.

Behind every case presented in this Handbook lies a story of persistence, adaptation, and learning. Many of these initiatives were built through trial and error, overcoming financial constraints, market and technical barriers, and behavioural resistance. Their journeys demonstrate that resilience is not merely an outcome of circularity, but often the process through which sustainability is achieved.



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Summary of the Handbook

The transition towards a circular food system in Sri Lanka requires changes across business practices, institutional capacity and the allocation of capital. Persistent challenges such as rising input costs, resource inefficiency and significant post harvest losses create both economic pressures and opportunities for businesses to improve the way resources are used and value is retained. Addressing these challenges requires coordinated action across businesses, financial institutions, and other market actors.

The Circular Food Business Handbook provides a practical reference for this transition by demonstrating how circular approaches can reduce resource losses, strengthen operational resilience and create opportunities for sustainable business growth. The application of Circular Economy Models in emerging markets can be constrained by limited market knowledge, differences in definitions and assessment approaches of financiers, and the perceived risks and costs associated with transitioning from established linear business models.

This Handbook responds to these challenges by contextualising existing Circular Business Models within the Sri Lankan food sector. The 32 case studies documented across the food value chain demonstrate a range of approaches, including renewable energy integration, the conversion of underutilised resources into productive inputs, extending the useful life of products, shared production and logistics systems, and recovery of resources.

Real examples of successfully operating Circular Business Models in Sri Lanka include:

- 15 farmers in Anuradhapura sharing a mobile solar powered water pumping system to save LKR 20,000 monthly on diesel and kerosene expenses
- A regenerative farm in Mullaitivu improving cashflow by 35% with diversified crop portfolio and access to organic farms
- Agroforestry and production of bio fertilisers leading to 60% margin improvement for an organic food business in Rambukkana

Together, these examples illustrate how circular practices can reduce dependence on virgin inputs, improve resource efficiency, diversify revenue, increase cashflows, profitability and strengthen business resilience.

The Handbook provides practical frameworks to support businesses in moving from identifying circular opportunities to implementing and scaling them. The Plan Do Check Act (PDCA) approach provides a structured process through which businesses can assess opportunities, test circular solutions under operational conditions, evaluate results and progressively scale approaches that demonstrate commercial and operational value.

This Handbook further links circular interventions to conventional business and financial considerations, including costs, revenues, margins, cash flows, investment requirements and risk. This provides guidance to businesses to assess circular opportunities not only in terms of their environmental benefits, but also in terms of their potential contribution to financial performance and long term business resilience. Food businesses can de-risk their Circular Economy projects and attract financing by demonstrating a combination of technical, financial, operational, and governance strengths.

Financial institutions can use this evidence to better understand Circular Business Models, identify risks associated with linear practices and develop financing approaches to strengthen business performance.

By integrating circular principles into business strategies, investment decisions and financial assessments, Sri Lanka can move towards a food system that retains more value within its value chains. The priority is now to translate proven circular opportunities into viable investments and scalable business practices that contribute to resilience of businesses, communities and the wider economy.



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Case for circularity in the food sector

CHAPTER 01

Cost and inefficiencies in the Sri Lankan food value chain

If there is an overarching lesson from Sri Lanka's recent experience of global and domestic economic shocks, it is that the economics of the food industry are changing fundamentally. Climate change, resource scarcity, rising input costs, exchange rate volatility, and supply chain disruptions are creating a more uncertain operating environment for the agri and food sector. While the scale and nature of these pressures vary across businesses and value chains, together they have significant cost impacts for the food sector, even from the pre Covid benchmark. In the last six years, the costs of key agricultural and food production inputs (water, electricity, fuel, plastics, and fertilisers) have escalated rapidly, with input specific price increases compounding from high double digits up to triple digits, drastically outpacing general inflation.

Despite these cost increases, the volume of waste generated across the country tells a very different story. Post-harvest losses of vegetable and fruits alone in Sri Lanka are around 30-40%[1]. Post-harvest losses are especially common in perishable products due to inadequate storage facilities, weak logistics infrastructure, inefficient handling practices, and limited mechanisation[2, 3].

This systemic waste is further compounded by Sri Lanka's overly complex agri-food value chain. Stretching across farmers, intermediaries, processors, and retailers, Sri Lanka's traditional value chain is burdened by structural bottlenecks that generate waste hotspots at almost every step from harvest to disposal (Figure 1).

Figure 1: Inefficiencies and waste drivers in traditional food value chain

Agri inputs and farm production

- Excessive agrochemical use
- Inefficient irrigation
- Fragmented land use
- Low mechanisation
- Monocropping and soil degradation
- Inefficient harvesting practices
- Underutilisation of agricultural residues
- Weak farmer coordination
- Poor aggregation systems
- Inefficient collection of surplus harvests
- Poor management by intermediaries
- Poor post harvest handling

Processing, packaging and distribution

- Inefficient sorting and grading
- Low value addition
- Disposal of by products
- Inefficient processing systems
- Lack of resource recovery technologies
- Limited sustainable packaging alternatives
- Inadequate cold chain infrastructure
- Poor inventory management
- Inadequate preservation systems
- Insufficient storage facilities for perishables
- Transport inefficiencies and empty return trips

Retail and consumption

- Overserved food and plate waste
- Low consumer awareness on food waste
- Low adoption of reusable packaging
- Poor waste segregation at household level
- Limited participation in composting and recycling

Waste management

- Open dumping of food waste
- Landfilling of organic waste
- Open burning of agricultural and packaging waste
- Low recovery of recyclable materials
- Underutilisation of organic waste
- Limited circular recovery and reuse systems

Circularity as a pathway to waste mitigation

The Circular Economy offers a regenerative approach to minimising waste and resource losses throughout the food value chain. By shifting from a linear "take-make-dispose" model to a closed loop system, the Circular Economy slows and narrows material and energy flows through resource reuse, recycling, and regeneration to reduce environmental impacts and increase profitability. Circular Economy builds stronger connections between industry and society by encouraging active collaboration among all value chain stakeholders driving long term sustainability and creating economic value. The World Economic Forum identifies five Circular Economy Business Models[4].

The integration of Circular Economy Business Models across the agri and food value chain enables circular practices to be implemented systematically. These models help businesses operationalise circularity by embedding resource-efficient, regenerative, and value retention practices into daily operations (see Table 1). The examples on the next page highlight practical circular models that can be applied across the food value chain, many of which are already being practiced in Sri Lanka without being defined as a Circular Economy model (see Figure 2).

Table 1: Circular Economy Business Models in the food sector

Circular Economy Business Model	Circular Economy practices in the food sector
Circular inputs	Promotes the use of renewable, recyclable, biodegradable, and sustainably sourced inputs such as organic fertilisers, bio-based packaging materials, renewable energy, and regenerative agricultural practices
Resource recovery	Recovers valuable materials, nutrients, water, and energy from food waste, by-products, and production residues through composting, bioenergy generation, animal feed production, wastewater recovery, and material recycling
Product use extension	Extends the useful life of products, packaging, machinery, and materials through repairability, reuse, refurbishment, reconditioning, reusable packaging systems, and improved storage technologies
Sharing economy	Encourages the shared use of underutilised assets, infrastructure, transport, storage facilities, cold-chain systems, machinery, and digital platforms to improve resource efficiency, reduce operational costs, and increase accessibility
Product-as-a-service	Shifts ownership-based consumption models towards service-based systems where providers retain ownership and responsibility for maintenance, recovery, reuse, upgrading, and end-of-life management of products, packaging, or equipment

> “To maximise impact and promote business resilience, circularity should be embedded across the agri and food value chains.

Figure 2: Embedding circularity across the food value chain

INPUT SUPPLY

Biofertilisers and organic fertilisers
converting organic waste into agri inputs

Biochar production
pyrolysis to convert biomass residues into soil enriching agri inputs

Coconut coir growing media
using coconut coir instead of new materials to grow plants

Reusable seedling trays
replacing single-use plastic nursery materials

Seed saving systems
retaining and exchanging seeds within farming systems

Renewable energy irrigation
powering irrigation with solar and other renewable energy systems

FARM PRODUCTION

Regenerative agriculture
using organic residues and reducing external inputs

Integrated crop-livestock systems
using livestock manure as a fertiliser input and crop residues as feed

Rice-fish farming
producing more food from the same land and water

Agroforestry
integrating trees with crops to retain soil moisture and protect against climate

Precision fertiliser application
matching nutrient application to crop requirements to increase yield and reduce fertiliser costs

Solar drying
extending shelf life using renewable energy and reducing post-harvest losses

PROCESSING, PACKAGING AND DISTRIBUTION

Reusable crates, sacks and baskets
replacing single-use packaging used during harvesting, storing and transporting

Produce rescue and secondary markets
directing imperfect or surplus produce to alternative markets

Wastewater and nutrient recovery
treating wastewater to recover water and nutrients for reuse

Industrial symbiosis
connecting factories so that one company's waste, heat, water or by-products become another company's input

Shared renewable energy enabled processing and distribution
powering shared processing, cold storage, and transport using renewable energy generated from solar panels and biomass

WASTE MANAGEMENT AND RECOVERY

Circular waste collection systems
segregating organic, recyclable and residual waste to maintain material value

Anaerobic digestion
converting organic waste into biogas and nutrient-rich digestate

Black soldier fly systems
converting food waste into insect protein and frass fertiliser

Nutrient recovery
recovering nitrogen, phosphorus and other nutrients from organic waste and wastewater

Plastic pyrolysis
converting contaminated plastic materials and packaging into oils, gases and carbon black

Cascading use of biomass
progressively using organic materials for recovering energy or nutrients at end of life

RETAIL AND CONSUMPTION

Reverse logistics
using existing delivery networks to collect packaging, food surplus and other materials on return journeys

Surplus food redistribution
redirecting safe unsold food to charities, communities or alternative markets

Refill and reuse systems
replacing single use food and beverage packaging with refillable or returnable systems

Ugly and imperfect produce markets
creating commercial channels for produce that would otherwise be rejected on appearance

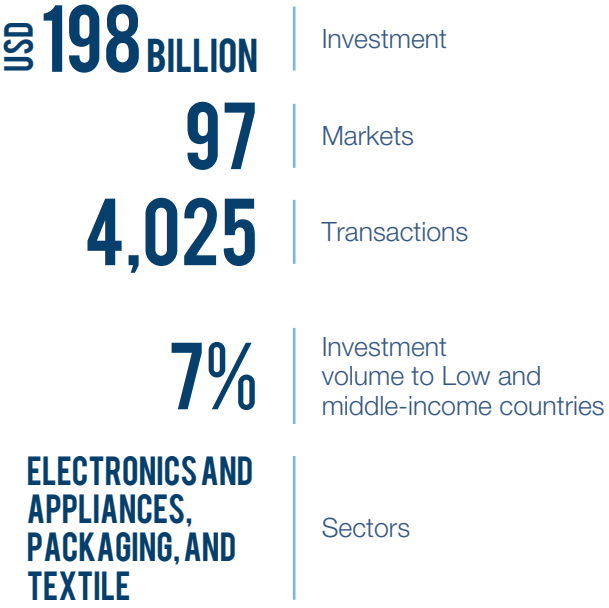
Low waste retail models
combining demand forecasting, dynamic pricing, portion optimisation and better inventory management to prevent food waste

Circular Economy and financial value creation

The financial value of circularity extends beyond the immediate savings from reducing waste. For businesses, it can fundamentally change the economics of how value is created from existing assets, materials and products. Circular Economy Business Models can improve asset utilisation, revenue diversification and return on capital, while reducing business dependence on continuously purchasing new resources[5]. This creates an important shift in how investment decisions are viewed. Therefore an investment in a circular solution should not only be assessed against its environmental and social benefits, but against its ability to generate additional cash flows, avoid future costs and increase the productive value of assets.

Global evidence suggests that these opportunities are increasingly being recognised by investors, with circular businesses and assets attracting growing pools of private and public capital (see Figure 3).

Figure 3: Scale of global Circular Economy investments (2018–2024, cumulative totals)



Source: IFC Circular Economy Investment Tracker, (2025)[6]

For Sri Lankan businesses and financial institutions, the greater risk may ultimately be the cost of not adapting. A business model that appears profitable today can become less viable when the underlying assumptions about the availability and price of materials, energy, land, water or disposal capacity change. Businesses with high resource dependence may face declining margins or require increasingly large amounts of working capital simply to maintain the same level of production.

At the financial sector level, these pressures can translate into credit risk, stranded assets and declining collateral values where businesses fail to adapt to changing markets, technologies and regulatory expectations. This is particularly relevant for lenders with significant exposure to agriculture, food processing, manufacturing, tourism and SMEs, where resource and climate related risks can directly affect debt repayment capacity.

Conversely, financing circular investments can provide financial institutions with an opportunity to improve the resilience of their loan portfolios while developing new lending products and reaching businesses with emerging investment needs. The opportunity is therefore not simply to finance “green projects”, but to identify where circularity can strengthen a borrower’s underlying business model to enable long-term financial resilience.

> “For Sri Lankan businesses and financial institutions, the greater risk may ultimately be the cost of not adopting circularity.



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Case studies of Circular Economy business and initiatives

CHAPTER 02

This chapter showcases 32 case studies from Sri Lanka's circular food system, spanning businesses and initiatives diverse in scope, scale, and geography. From small-scale regional farms to large export processing facilities, these real examples prove that adopting circular practices is a proven strategy for unlocking new revenue, cutting costs, and building long term business resilience. The case studies are organised into four key stages of the food value chain as illustrated in Figure 4: (a) Agri inputs and farm production (b) Processing, packaging and distribution (c) Retail and consumption (d) Waste management.

Figure 4: Value chain analysis of the selected case studies

Agri inputs and farm production	Processing, packaging and distribution	Retail and consumption	Waste Management
• Anuradhapura Farmer Organisations	• Amazon Trading Pvt LTD	• Go-Eco Products	• Bio Fuel Lanka
• Bio Green Biochar	• Hakwatunawa Wewa Smoked Fish Initiative	• Halpita Community Enterprise	• Gunadamin Elephant House
• Ceylon Agro Food Technologies Pvt LTD	• Hathamunagaala Circular Paper Initiative	• Heritance Kandalama	• Maheero Banana Fiber Pvt LTD
• Forest Garden Organics Pvt LTD	• Kiruwanaganga Tea Factory	• Jetwing Lake	• ModernPack Pvt LTD
• Guruwela Horticultural Model Farm	• Moveflex Pvt LTD	• Riviera Eastern Enterprises Pvt LTD	• Puraweduma Ceylon BSFL Pvt LTD
• Hagala Tea Estate	• Novateq Pallets Pvt LTD		• Randeepa Plastic Pyrolysis
• HarePark Estate, Sri Lanka State Plantation Corporation	• Renewable Energy for SMEs Initiative		• Robin Hood Army Sri Lanka
• iGrow Lanka Pvt LTD	• Utech Technologies Pvt LTD		
• Laggala Regenerative Paddy Farming Initiative			
• Mobile Solar Irrigation Initiative			
• Nethmi Smart Farm and Milk Toffee Products			
• SenzAgro Pvt LTD			

Note: In categorising the organisations according to their respective value chain stages, emphasis was placed on the most dominant activities and characteristics reflected within each case study. Where overlaps across multiple stages were evident, the categorisation was based on the most prominent value chain function demonstrated by the organisation.

Agri inputs and farm production



Anuradhapura Farmer Organisations

Fragmented paddy plots → Integrated circular farming units

Stage: **Agri inputs and farm production**

Initiated: **2025**

Location: **Anuradhapura District**

CIRCULAR APPROACH:
RESOURCE EFFICIENCY, REGENERATIVE AGRICULTURE

FINANCED BY:
GCF + FARMER CONTRIBUTIONS

COST SAVINGS:
90%
LAND PREPARATION COSTS

WATER SAVINGS:
30%

YIELD INCREASE:
33%

Description of business activity

This initiative by 250 farmers replaces the traditional, fragmented smallholder model to a circular, multi-crop ecosystem. By removing internal dikes and redistributing surface soil, the farmer societies enable full mechanisation and uniform water distribution. The model repurposes widened main dikes for diversified cash crop cultivation (finger millet, radish), creating secondary revenue streams and natural pest control buffers. This systemic shift regenerates soil structure and optimises seasonal land use.

Investment and operational highlights

Metric	Traditional model	Circular model
Land structure	Fragmented plots	Consolidated farming units
Water distribution	Tail-end farmers face ~33% loss	Efficient and equitable distribution
Labour and time	Labour-intensive land preparation	90% time saving via mechanisation
Resource inputs	High agrochemical dependency	~10% reduction via integrated nutrient cycling
Income streams	Mono-culture (paddy only)	Multi-cropping (paddy + dike based crops)

Financial impact

Cost advantage achieved through reduction of land preparation costs from ~LKR 50,000 to LKR 5,000 per hectare (~90% savings)

Resource efficiency improved through ~30% reduction in water usage and reduced agrochemical input of ~10%

Productivity gains demonstrated through yield increase from 1,845 kg to 2,460 kg per acre, with a projected ceiling of up to 3,075 kg

Additional income generation enabled through cultivation of cash crops on dikes (e.g., finger millet, lady's fingers, radish)

Land utilisation improved by ~5% through dike optimisation without acquiring new land

Environmental impact

- 30% reduction in water usage, critical for climate-resilience in the Dry Zone leading to improved tolerance to extreme weather events (floods/droughts)
- Better drainage of soil, reduced methane emission
- Enhanced nutrient cycling and soil structure
- Optimised machinery use efficiency, carbon emission reduction 60-70%

Social impact

- 90% time saving in land preparation allows farmers to engage in higher-value alternative livelihoods
- 60% reduction in labour hours
- Re-activation of previously abandoned lands and brought inactive farmers back into the productive economy
- Improved food security through increased and stable production

Key enablers for growth and continuity

- Collaborative support from the respective organisations and the GCF Knuckles Project
- Demonstration effects from early participants reduced behavioural resistance among the wider community
- Strong coordination among the 6 Farmer Organisations for collective land management

Lessons learned

The model shows that circular land consolidation can reduce the financial risks of land fragmentation. Despite high initial land levelling costs (around LKR 800,000 per hectare), circular farming generates higher long-term returns than traditional paddy cultivation. Sustaining these benefits depends on coordination and transparency among farmer societies.

Bio Green Biochar

Paddy husk waste → Sustainable fertiliser

Stage: **Agri inputs and farm production**
Initiated: **2022**
Location: **Anuradhapura District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, SHARING ECONOMY

FINANCED BY:
GCF + GOVERNMENT OF SRILANKA

CIRCULAR REVENUE SHARE:
100%

ADDITIONAL REVENUE:
LKR 50,000 MONTHLY FOR 20 RURAL WOMEN

PAYBACK PERIOD:
6 MONTHS

Description of business activity

Bio Green Biochar converts paddy husk into biochar through a pyrolysis based waste-to-value system. Paddy husk waste collected from nearby rice mills is processed into biochar and packed into 5 kg bags for agricultural and home gardening use. Pyrolysis machinery funded through the Climate Resilient Integrated Water Management (CRIWMP) project is shared among 20 women, strengthening collaborative production and resource efficiency. The initiative transforms agricultural residues into soil enhancements that improve soil fertility and moisture retention while reducing dependence on chemical fertilisers.

Investment and operational highlights

Metric	Traditional model	Circular model
Paddy husk waste	Burnt or dumped	Converted into biochar
Soil management	Chemical fertiliser dependent	Biochar based soil enhancement
Production system	Individual and fragmented	Shared community based machinery
Revenue streams	Limited rural income	Biochar sales and packaging
Resource use	Linear waste disposal	Circular agricultural utilisation

Financial impact

Cost advantage through utilisation of low cost paddy husk waste as a production input replacing chemical fertiliser dependency

Additional revenue enabled through biochar sales at approximately LKR 50 per kg, generating around LKR 50,000 monthly for community groups

Higher supply demonstrated through an estimated payback period of approximately 6 months

Market development strengthened through sales to farmers, universities, local authorities, and agricultural organisations

Environmental impact

- Reduction of paddy husk waste burning and associated emissions
- Improved soil fertility, soil moisture retention, and soil structure through biochar application
- Reduced dependence on chemical fertilisers in home gardening and commercial agriculture
- Promotion of circular agricultural waste utilisation

Social impact

- Improved income generation opportunities for 20 rural women
- Strengthened women's participation, empowerment and acceptance
- Increased community awareness on sustainable agriculture

Key enablers for growth and continuity

- Financial and technical support from GCF and UNDP and market linkages through universities and agricultural institutions
- Strong community participation and acceptance
- Technical guidance and market linkages through universities and agricultural institutions and implemented by Janathakshan Gte Ltd

Lessons learned

The initiative demonstrates that community based initiatives can successfully de-risk high capital costs for circular projects. Women led production systems, combined with technical support and market access, can significantly strengthen rural livelihoods while supporting sustainable agricultural transformation.

Ceylon Agro Food Technologies (CAFT) Pvt Ltd

Traditional farming → Precision agriculture

Stage: **Agri inputs and farm production**
Initiated: **2023**
Location: **Colombo District**

CIRCULAR APPROACH:
RESOURCE EFFICIENCY, SHARING ECONOMY, PRODUCT-AS-A-SERVICE

FINANCED BY:
INTERNAL FUNDS

COST SAVINGS FOR FARMERS:
30–40%

LABOUR TIME SAVINGS:
94%

SCALE:
500+ FARMERS REACHED

Description of business activity

CAFT replaces wasteful manual spraying with Drone-based Precision Agriculture. The company operates a product-as-a-service model where farmers pay a fixed fee of ~LKR 2,200 per acre, bypassing the prohibitive capital costs of advanced machinery. The AI driven drones apply fertilisers and pesticides with surgical accuracy, covering three crop cycles annually. By integrating this technology layer into traditional farming, the company eliminates chemical drift and over application, ensuring that resource usage is optimised for major crops such as paddy, tea, sugarcane, and coconut.

Investment and operational highlights

Metric	Traditional model	Circular model
Input use	Excessive and wasteful	Optimised via precision application
Labour requirement	High (manual spraying)	Low (fully automated systems)
Time taken	~1 day per acre	~30 minutes per acre
CapEx Requirement	High (cost of machinery)	Zero (Product-as-a-service)
Market resilience	Vulnerable to input price hikes	Risk-mitigated via 50-70% reduced usage

Financial impact

Cost advantage achieved through 30–40% reduction in input costs due to precise application of agrochemicals

Resource efficiency improved through 50–70% reduction in chemical use, based on crop type

Operational efficiency enhanced through reduction in labour time from one full day to ~30 minutes per acre

Scalability demonstrated through service delivery across 5,000+ acres and 500 farmers with three application cycles annually

Accessibility improved by eliminating upfront investment, enabling smallholder farmers to adopt advanced technologies

Environmental impact

- Reduction in chemical usage by ~50–70%, minimising environmental pollution
- Lower chemical drift, protecting surrounding ecosystems and biodiversity
- Promotion of sustainable farming practices through efficient input management

Social impact

- Improved farmer health and safety through reduced exposure to agrochemicals
- Provides a critical solution to the acute labour shortages currently facing the Sri Lankan agricultural sector
- Increased access to advanced farming technologies for smallholder farmers

Key enablers for growth and continuity

- Strong multidisciplinary expertise in engineering, AI, and agronomy
- Strategic partnerships with agribusinesses, banks, and farmer organisations
- Growing demand for efficient and technology-driven agricultural solutions
- Partnerships with agribusiness firms facilitate rapid scaling across diverse crop types like coconut and tea.
- Field demonstrations and clear proof-of-savings have built high levels of trust within conservative farming communities

Lessons learnt

The CAFT model proves that technology adoption is a function of affordability, strong partnerships, and continuous farmer engagement. The long term success of AgriTech in fragmented agricultural systems depends on ensuring that precision efficiency translates directly into increased household disposable income for the farmer.

Forest Garden Organics Pvt LTD

Organic waste → Sustainable fertiliser

Stage: **Agri inputs and farm production**
Initiated: **2013**
Location: **Kegalle District**

CIRCULAR APPROACH:
AGROFORESTRY, REGENERATIVE AGRICULTURE, SHARING ECONOMY

FINANCED BY:
INTERNAL FUNDS + BORROWINGS

CIRCULAR LINKED REVENUE SHARE:
35%

COST SAVINGS:
30%

MARGIN IMPROVEMENT:
60%

Description of business activity

Forest Garden Organics implements an Agroforestry model that harvests waste biomass from a multilayered ecosystem designed to mimic the structure and functions of a natural forest. The company combines organic matter along with agricultural residues, food waste and wild plant materials to process premium quality bio-fertilisers. By integrating sharing economy, the processing hub connects with other smallholder forest gardens to enable production of their own fertilisers. This system ensures a regenerative system that restores soil health and maximises land productivity.

Investment and operational highlights

Metric	Traditional model	Circular model
Input utilisation	Inefficient disposal of organic waste	High utilisation through resource recovery
Primary asset	Depleting soil	Growing forest capital
Revenue streams	Single (agricultural output)	Multiple (agriculture output and fertiliser sales)
Supply chain	Fragmented and import dependent	Integrated stakeholder collaboration
Market Access	Traditional markets	Premium organic markets

Financial impact

Cost advantage achieved through a 30% reduction in fertiliser cost, decoupling its bottom line from global chemical price volatility

Additional revenue generation of 40% through diversification into organic fertiliser production and expanding market access

Higher supply chain efficiency driven by forward and backward integration with suppliers and customers, ensuring consistent resource flows

Environmental impact

- Diverts 85% of its waste from landfills
- Agroforestry model protects crops against heat stress and heavy rainfall
- Recovers nitrogen and minerals from wild plant materials, returning them to the soil and to the food system

Social impact

- The sharing platform provides an additional income stream for local smallholder farmers
- Educating students on agroforestry models through collaborations with technical schools and internship programs

Key enablers for growth and continuity

- Strong market demand for sustainable and organic agricultural inputs
- Environmental awareness and sustainability driven business strategy
- Forward and backward supply chain integration, creating operational synergies
- Opportunities for expansion through international trade and partnerships

Lessons learnt

Forest Garden Organics proves that agroforestry is a de-risking strategy. By treating the forest as natural capital, the company has built a climate resilient and regenerative model. Success in this sector requires moving beyond planting trees to creating integrated resource flows between waste generators and the end user market.

Guruwela Horticultural Model Farm

Traditional farming → Circular integrated agro-farming

Stage: **Agri inputs and farm production**
Initiated: **2013**
Location: **Matale District**

CIRCULAR APPROACH:
CIRCULAR INPUTS, RESOURCE RECOVERY, INTEGRATED FARMING SYSTEMS, RENEWABLE ENERGY

FINANCED BY:
GRANT + INTERNAL FUNDS

COST SAVINGS:
100%

ADDITIONAL REVENUE:
LKR 100,000

Description of business activity

Guruwela Horticultural Model Farm operates as a circular integrated agro farming system combining crop cultivation, dairy farming, poultry farming, goat farming, renewable energy, and smart water management. The farm cultivates diverse crops, including mango, coconut, banana, jackfruit, dragon fruit, orange, and soursop using ultra high-density plantation and scientific cultivation techniques to improve land productivity. Livestock waste and silage are reused as organic fertiliser, reducing chemical input dependency and strengthening nutrient cycles. Renewable energy and water efficiency are supported through solar powered irrigation systems and rainwater harvesting mechanisms, creating a resource efficient and regenerative farming model.

Investment and operational highlights

Metric	Traditional model	Circular model
Farming system	Single-income crop farming	Integrated crop-livestock farming
Fertiliser use	Chemical input dependent	Organic nutrient recycling
Water management	Conventional irrigation	Rainwater harvesting + solar irrigation
Revenue streams	Crop sales only	Crops, dairy, poultry, livestock, agro-tourism
Resource utilisation	Fragmented operations	Closed-loop integrated farming systems

Financial impact

Operational efficiency improved through crop integration and livestock systems utilising shared resources and nutrient recycling

Income diversification enabled through dairy, poultry, goat farming, crop cultivation, and direct product marketing

Value addition strengthened through direct milk product sales to consumers and supply arrangements with Milco for excessive milk

Community income opportunities enhanced through surrounding poultry and integrated farming activities, generating estimated additional monthly income of LKR 100,000

Environmental impact

- Reduced dependence on chemical fertilisers and agrochemicals through organic farming practices, including the use of livestock waste and silage to improve soil fertility
- Enhanced water use efficiency through rainwater harvesting and solar-powered irrigation systems
- Increased land productivity through ultra-high-density and scientific cultivation methods

Social impact

- Employment generation for nearby rural communities with daily wages of approximately LKR 3,500
- Improved agricultural knowledge and practical farming skills among local communities
- Training opportunities for NVQ students and agricultural trainees through model farm activities
- Promotion of agro-tourism and exposure to circular and sustainable farming innovations

Key enablers for growth and continuity

- Infrastructure and institutional support from the Mahaweli Authority Sri Lanka and local government institutions
- Technical guidance and irrigation development support
- Strong community participation and knowledge-sharing mechanisms
- Adoption of modern cultivation technologies and scientific farming practices

Lessons learned

The initiative demonstrates that long-term vision, strong leadership, and continuous innovation are critical for implementing successful circular agricultural systems. Integrating modern technologies, renewable energy, and value-added farming approaches significantly improves productivity, sustainability, and rural economic resilience while reducing dependency on conventional agricultural practices.

Hagala Tea Estate

Conventional tea replanting → Climate-resilient canopy restoration

Stage: **Agri inputs and farm production**
Initiated: **2024**
Location: **Kandy District**

CIRCULAR APPROACH:
REGENERATIVE AGRICULTURE, RESOURCE EFFICIENCY

FINANCED BY:
GCF + INTERNAL FUNDS

COST SAVINGS:
LKR 3–4.5 MN PER HECTARE ANNUALLY

YIELD INCREASE:
35% (FIRST YEAR)

ADDITIONAL REVENUE:
LKR 680,000 (PER HECTARE)

Description of business activity

The SSTB (Stripe - Spreading of Tea Bushes) model applies regenerative plantation management practices to restore tea canopy cover while improving productivity of existing tea bushes. Instead of conventional tipping after four months from pruning, shoots are allowed to grow for 120–150 days and are then radially spread along rows using striped arrangements. This process rapidly rebuilds bush frame and restores canopy cover, suppresses weeds naturally, and reduces dependence on chemical inputs. By extending the productive life of existing tea plants, the system avoids costly and resource intensive replanting while improving climate resilience and operational efficiency improving soil health.

Investment and operational highlights

Metric	Traditional model	Circular model
Replanting cycle	Long-term and resource-intensive	Rapid regenerative restoration
Canopy restoration	~3 years	6–7 months
Weed management	Chemical-dependent	Natural suppression through dense canopy cover
Productivity	Declining/ stagnant yields	Yield increase of 25–60% within months
Resource utilisation	High cost wasteful operation	Low cost and highly efficient resource use

Financial impact

Cost advantage achieved through reduced replanting expenditure and annual weed management savings of approximately LKR 3 - 4.5 Mn per hectare

Productivity improvement demonstrated through approximately 35% yield increase in the first year (ranging from 25–60%)

Revenue enhancement enabled through additional first-year income of approximately LKR 680,000 per hectare

Operational efficiency improved through canopy restoration within 6–7 months compared to conventional systems requiring around LKR 3 - 5 Mn per annum

Rapid financial return achieved with payback periods of less than one year

Environmental impact

- Increased ground cover approximately up to 90%, in 12 months compared to 40- 50% under conventional systems
- Enhanced drought tolerance by tea bushes and resilience to climate-related stress conditions
- Reduced weedicide usage, supporting improved soil health and drinking water quality

Social impact

- Improved plucker incomes through higher crop volumes
- Improved employment stability during climate-related disruptions
- Strengthened community well-being through more stable agricultural productivity

Key enablers for growth and continuity

- Collaboration between the State Plantation Corporation and GCF Knuckles Project
- Technical expertise, monitoring, and financial support from project partners
- Strong estate level management commitment to long-term sustainability
- Demonstrated economic and environmental benefits encouraging adoption

Lessons learned

The SSTB initiative demonstrates that low cost regenerative innovations can significantly improve productivity, profitability, and climate resilience in plantation agriculture. Although resistance to change may initially limit adoption, visible results rapidly build stakeholder confidence. Strong institutional collaboration, experimentation, and evidence based implementation are essential for scaling circular and regenerative agricultural practices.

Hare Park Estate, Sri Lanka
State Plantation Corporation

Monoculture tea → Circular multi-cropping system

Stage: **Agri inputs and farm production**
Initiated: **2025**
Location: **Kandy District**

CIRCULAR APPROACH:
RESOURCE EFFICIENCY, REGENERATIVE AGRICULTURE, MULTI-CROPPING

FINANCED BY:
GCF + INTERNAL FUNDS

REVENUE GROWTH:
LKR 3.5–4.2 MN ANNUALLY (3RD YEAR ONWARDS)

ADDITIONAL REVENUE:
LKR 550,000 PER HECTARE (UP TO 3RD YEAR)

INCREASED INCOME FOR WORKERS:
LKR 42,000 (PER MONTH)

Description of business activity

Hare Park Estate has replaced conventional monoculture with a multi-layered, regenerative ecosystem that integrates tea with coffee, shade crops, and lemongrass hedging. This restores natural nutrient cycling and soil structure, significantly reducing the need for synthetic fertilisers. By combining advanced soil conservation with strategic rainwater runoff management, the estate enhances biodiversity and soil water retention, maximising land productivity and creating a climate-resilient agricultural system.

Investment and operational highlights

Metric	Traditional model	Circular model
Cropping system	Monoculture tea	Multi-layered, multi-cropping
Soil health	Nutrient depleted, high erosion	Restored via biodiversity and organic practices
Water management	Low retention, high runoff	Improved retention and groundwater storage
Revenue streams	Single (tea only)	Multiple (tea, coffee, lemongrass, shade crops)
Input dependency	High synthetic input use	Self-regulating natural nutrient systems

Financial impact

Cost advantage achieved through significant savings on fertilisers and herbicides by leveraging natural biodiversity for pest and weed management

Significant revenue growth enabled through diversified crop streams generating up to LKR 3.5–4.2 Mn per hectare annually

Value creation driven by improved land productivity, increased yields, and enhanced ecosystem services

Higher climate resilience achieved through improved soil health, water retention, and diversified cropping systems

Environmental impact

- Enhanced biodiversity with functioning ecosystem that supports natural pollination and pest control leading to savings in fertilisers and herbicides
- Multi-layered vegetation enhances fog interception, significantly increasing the water yield for the local watershed
- Enhanced water retention and reduced surface runoff, 1.5 million litres of groundwater storage per hectare

Social impact

- Creation of 1-2 new job opportunities per hectare of project interventions implemented was observed, attracting workers f rom the peripheral communities
- Increased income opportunities for plantation workers ~LKR 42,000 monthly

Key enablers for growth and continuity

- Strong managerial commitment to sustainability and innovation
- Technical expertise provided through the GCF Knuckles Project
- High workforce involvement in implementation and scaling
- On time worker payments need to be ensured securing workers trust on their job

Lessons learned

The Hare Park model proves that biodiversity is a financial asset. By treating the plantation as a circular ecosystem, the estate unlocks value in underutilised land. This demonstrates a scalable pathway for restoring degraded plantation lands while mitigating the systemic risks of climate change and chemical price volatility. This example has proven that the challenge of labour scarcity in plantations can be overcome sustainably with the support of peripheral communities, if reliable and attractive job opportunities are created within plantations assured with timely payments.

iGrow Lanka Pvt LTD

Traditional agriculture → Circular regenerative farming systems

Stage: **Agri inputs and farm production**
Initiated: **2022**
Location: **Mullaitivu District**

CIRCULAR APPROACH:
CIRCULAR INPUTS, SHARING ECONOMY
FINANCED BY:
INTERNAL FUNDS + BORROWING (LKR 25 MN)

CIRCULAR LINKED REVENUE SHARE: **35%**

COST SAVINGS FOR FARMERS: **30%**

CASH FLOW IMPROVEMENT: **35%**

Description of business activity

iGrow Lanka operates an integrated closed loop system that pairs multi crop cultivation with livestock farming. Animal waste is routed directly into biogas digesters and composting loops, while crop residues are repurposed as nutrient rich livestock feed. The farm utilises an integrated mobile app and IoT device ecosystem to monitor soil moisture, climate data, and crop health in real time. Through a co-farming sharing model, local smallholders share access to this digital platform, land, and precision machinery, eliminating heavy upfront costs and maximising asset utilisation across the community.

Investment and operational highlights

Metric	Traditional model	Circular model
Input use	High chemical input dependence	Regenerative, and circular farm
Waste	Field burning or pollution heavy	Resource recovery (Compost, biogas)
Farming system	Monocropping	Multi-cropping and regenerative practices
Value generation	Yield-focused/ commodity pricing	Premium organic markets

Financial impact

Cost savings of 30% achieved through replacement of synthetic inputs with organic and farm-generated alternatives

Additional revenue of ~35% generated through diversified crop production and access to organic and premium markets

Value to farmers created through cooperative sharing framework by splitting costs and extracting significantly higher revenue per acre

Higher system resilience and more stable and predictable cashflows

Environmental impact

- Reduction of agricultural waste through composting and closed-loop systems
- Improved soil fertility and biodiversity through regenerative practices
- Efficient water management through rainwater harvesting systems

Social impact

- Creation of employment opportunities and improved rural livelihoods
- Training and capacity building via iGrow Academy for youth and smallholders
- Flexible employment opportunities increasing participation of women

Key enablers for growth and continuity

- Increasing market demand for organic and sustainably produced agricultural products
- Blending traditional regenerative principles with modern precision techniques to closely monitor soil health, water retention, and crop yields.
- Community and farmer collaboration
- Adaptive risk management strategies in response to climate and market conditions

Lessons learnt

Sustaining regenerative agriculture requires shifting from a transactional mindset to a long-term value creation ecosystem. Scalability relies heavily on continuous grassroots training and trust building, showing that impact-driven agricultural innovation is highly profitable when backed by strong community ownership.

Laggala Regenerative Paddy Farming Initiative

Degraded paddy lands → Climate-resilient regenerative farming

Stage: **Agri inputs and farm production**
Initiated: **2025**
Location: **Matale District**

CIRCULAR APPROACH:
REGENERATIVE AGRICULTURE, CIRCULAR INPUTS

FINANCED BY:
GCF + FARMER CONTRIBUTION

COST SAVINGS:
LKR 100,000 PER ACRE

YIELD INCREASE:
40–60%

ADDITIONAL INCOME:
LKR 200,000–650,000 PER ACRE

Description of business activity

The initiative restores soil vitality and maximises land productivity on degraded settlement tracts by implementing a regenerative farming system. Instead of burning or discarding agricultural residues, farmers upcycle bio-waste such as burnt paddy husk and organic compost.
The system incorporates parachute tray transplantation alongside strict 30–40% reductions in irrigation water, chemical fertilisers, and agrochemicals. The traditional rice monoculture is replaced by a diversified multi-cropping matrix that integrates secondary cash crops, such as green beans, establishing a highly resilient agroecosystem that buffers farming households against both climate shocks and market volatility.

Investment and operational highlights

Metric	Traditional model	Circular model
Soil fertility	Low nutrient retention	Improved organic regeneration
Input dependency	High chemical use	Reduced through organic inputs
Water use	Inefficient	Optimised water resource utilisation
Production system	Monoculture (paddy only)	Diversified (Paddy + other field crops)
Farmer value proposition	Low profitability	Higher yields and reduced costs

Financial impact

Cost advantage achieved through reduction in cultivation cost from ~ LKR 200,000 to LKR 100,000 per acre under regenerative methods

Resource efficiency improved through 30–40% reduction in fertilisers, agrochemicals, and water usage while achieving 40-60% yield increase

Income diversification enabled through mid season crop cultivation generating additional income of ~LKR 200,000-650,000 per acre per season from ground nut, green gram, water melon, pumpkin etc.

Profitability enhancement achieved through gross income of ~LKR 465,000 per acre and net profitability of ~LKR 300,000 per acre

Environmental impact

- Reduced chemical fertiliser, agrochemical, and water usage by ~30–40%
- Improved soil health and carbon sequestration through application of burnt paddy husk and organic compost

Social impact

- Reduced indebtedness and financial pressure on farming households due to reduced cultivation costs
- Additional household income from surplus crop production
- Improved confidence on climate-resilient sustainable farming practices

Key enablers for growth and continuity

- Strong collaboration between farmers, Mahaweli Authority, and GCF Knuckles Project
- Training, monitoring, and technical guidance on regenerative farming
- Provision of regenerative inputs such as parachute trays and burnt paddy husk
- Demonstrated improvements in yield and soil quality encouraging wider adoption

Lessons learned

Although initial cultural resistance to leaving chemical fertilisers is significant, visible improvements in yield and profitability accelerates behavioural change among farmers. The regenerative farming initiative proves that to increase profits over the long run, building climate resilient farms relies on simple, low cost local solutions that recycle agricultural waste and protect the soil.

Mobile Solar Irrigation Initiative

Fossil fuel-based irrigation → Shared solar-powered irrigation systems

Stage: **Agri inputs and farm production**
Initiated: **2020**
Location: **Anuradhapura and Trincomalee Districts**

CIRCULAR APPROACH:
RENEWABLE ENERGY SYSTEMS, SHARING ECONOMY

FINANCED BY:
GCF + GOVERNMENT OF SRILANKA

CIRCULAR LINKED REVENUE SHARE:
100%

COST SAVINGS FOR FARMER:
LKR 20,000 PER MONTH

OPERATIONAL EFFICIENCY:
1 ASSET SHARED AMONG 15 FARMERS

Description of business activity

The initiative introduced mobile solar powered irrigation systems as a shared agricultural resource for smallholder farmers. These solar powered pumps are mounted on mobile platforms to replace diesel and kerosene powered irrigation systems, enabling multiple farmers to access a single renewable energy based asset. The system improves irrigation efficiency, reduces fuel dependency, and lowers operating costs while minimising environmental impacts associated with fossil fuel use. Through localised design and shared utilisation models, the initiative strengthens climate resilience and resource efficiency in agricultural communities.

Investment and operational highlights

Metric	Traditional model	Circular model
Energy source	Diesel and kerosene pumps	Solar powered irrigation systems
Asset utilisation	Individual ownership with low utilisation	Shared community-based infrastructure
Operating costs	High and fuel dependent	Reduced through renewable energy
Resource efficiency	Fossil fuel intensive	Renewable and low-emission
Farmer value proposition	Costly irrigation access	Affordable and resilient irrigation systems

Financial impact

Cost advantage achieved through LKR 20,000 monthly savings per farmer by eliminating diesel and kerosene fuel expenses

Resource optimisation achieved through renewable energy adoption reducing dependency on imported fossil fuels

Community resilience strengthened through uninterrupted irrigation access during fuel shortages and economic crises

Scalability supported through localised system customisation and shared governance structures

Environmental impact

- Reduced carbon emissions through replacement of fossil fuel powered systems
- Minimised water and soil contamination associated with diesel and kerosene usage
- Increased adoption of renewable energy technologies in agriculture
- Improved sustainability of irrigation practices through clean energy systems

Social impact

- Ensured continued irrigation access for smallholder farmers
- Strengthened community collaboration through shared infrastructure utilisation
- Increased accessibility to renewable energy technologies in rural farming communities

Key enablers for growth and continuity

- Financial and technical support from the GCF supported CRIWMP initiative
- Collaboration with Govijana product markets
- Shared ownership and community based utilisation models
- Localised technology adoption to agricultural needs
- Establishment of maintenance and governance frameworks for long term sustainability

Lessons learned

Sri Lanka's renewable energy potential can be effectively leveraged through shared community based technology models that improve accessibility and resource efficiency. Long term success depends on adapting technologies to local agricultural conditions while establishing clear governance, maintenance, and ownership structures. Strong institutional partnerships and clearly identified beneficiaries are essential for sustaining circular agricultural innovations over time.

Nethmi Smart Farm and Milk Toffee Products

Traditional dairy farming → Circular dairy systems

Stage: **Agri inputs and farm production**
Initiated: **2021**
Location: **Anuradhapura District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, WASTE-TO-VALUE

FINANCED BY:
GCF + INTERNAL FUNDS

ADDITIONAL MONTHLY REVENUE:
LKR 80,000

PAYBACK PERIOD:
18 MONTHS

GHG EMISSION REDUCTION:
60%

Description of business activity

Nethmi Smart Farm transformed a traditional dairy operation into a circular and resource-efficient smart farming system integrating dairy production, waste recovery, and value-added processing. A portion of the daily milk harvest is converted into milk toffee products and sold through local Women's Farm markets, diversifying income streams beyond raw milk sales. Animal waste is processed through a biogas system, reducing methane emissions while generating organic slurry for gardening and cultivation. In addition, sprinkler irrigation systems improve water efficiency, creating a closed-loop farming model that strengthens productivity, sustainability, and climate resilience.

Investment and operational highlights

Metric	Traditional model	Circular model
Dairy production	Limited to raw milk sales	Value-added dairy products
Animal waste	Disposed and unmanaged	Converted into biogas and organic slurry
Irrigation system	Conventional water use	Water-efficient sprinkler irrigation
Revenue streams	Single income source	Dairy, milk toffee, organic produce and vegetable
Resource efficiency	High input dependency	Integrated waste-to-value system

Financial impact

Cost advantage achieved through reduced fuel dependency and efficient waste management using biogas systems

Revenue diversification enabled through milk toffee sales generating ~LKR 4,000–5,000 per week and organic produce sales of ~ LKR 15,000–20,000

Environmental performance strengthened through reduction of GHG emissions by ~60% or more

Rapid financial return demonstrated through estimated payback periods of approximately 18 months

Environmental impact

- Reduced contamination and unpleasant odours through systematic waste management practices
- Reduced dependence on firewood by 50% and conventional fuels through biogas utilisation
- Lower GHG emissions through waste-to-energy systems
- Improved resource efficiency through water-saving irrigation technologies

Social impact

- Increased community trust in smart and environmentally responsible farming systems
- Improved technical knowledge and practical skills among rural farmers
- Improved rural living conditions through cleaner farm environments

Key enablers for growth and continuity

- Technical support from agricultural and biogas training institutions
- Community-based market access for value-added products
- Strong stakeholder cooperation supporting long-term sustainability

Lessons learned

The initiative reveals that a business is profitable when it begins operating as an ecosystem. By transforming what was once discarded as waste into energy and fertiliser, the farm stopped depending on volatile external markets and increased self-reliance. This shift proves that true economic stability comes from diversifying and utilising the full potential of inputs.

SenzAgro Pvt LTD

Traditional → Digital and resource efficient farming

Stage: **Agri inputs and farm production**
Founded: **2017**
Location: **Colombo District**

CIRCULAR APPROACH:
PRODUCT-AS-A-SERVICE, SHARING ECONOMY, RESOURCE EFFICIENCY

FINANCED BY:
INTERNAL FUNDS + BORROWINGS + DEVELOPMENT ASSISTANCE

PAYBACK PERIOD FOR FARMERS:
18–30 MONTHS

FARMER ADDITIONAL ANNUAL REVENUE:
1.5–4 MN

COST SAVINGS FOR FARMERS:
20–35%

Description of business activity

SenzAgro operates a digital, subscription based ecosystem that eliminates the prohibitive upfront CapEx of advanced precision farming. Instead of purchasing costly hardware, farmers leverage shared sensor networks paired with AI driven agronomic advisory platforms. The system captures real-time soil, moisture, and weather metrics, transmitting advice and warnings directly to smallholders. This precise, data-driven method significantly decreases post-harvest and crop losses, protecting farmers from climate volatility.

Investment and operational highlights

Metric	Traditional model	Circular model
Input efficiency	Low, resource heavy	High, data-driven precision
Revenue streams	Single (crop sales)	Multiple (subscription, data advisory)
Waste	High post-harvest and crop loss	Reduced through early disease and pest detection
CapEx	High upfront hardware costs	Low upfront via subscription model
Market access	Restricted by inconsistent quality	Enhanced (5-15% premium farm-gate prices)

Financial impact

5–15% higher farm-gate price due to data verified crop tracking to enable farmers to access premium and export markets

20-35% cost savings to farmers by accurately calculating precise fertiliser, pesticide, and water requirements

Lower CapEx for farmers due to the subscription based product-as-a-service model and shared sensor infrastructure for IoT utility

Extended product life and improved asset utilisation achieved via centralised maintenance and modular hardware swaps.

Environmental impact

- Reduced water use by 25% at farm level through precision irrigation
- ~10-20% decrease in crop and plant losses achieved by improving soil health contributed through the elimination of the overuse of fertilisers and agrochemicals

Social impact

- Supported 27,000+ farmers, integrating 8,000 women smallholders
- Creation of skilled AgriTech and advisory jobs in rural economies
- Improved farmer income stability and climate resilience

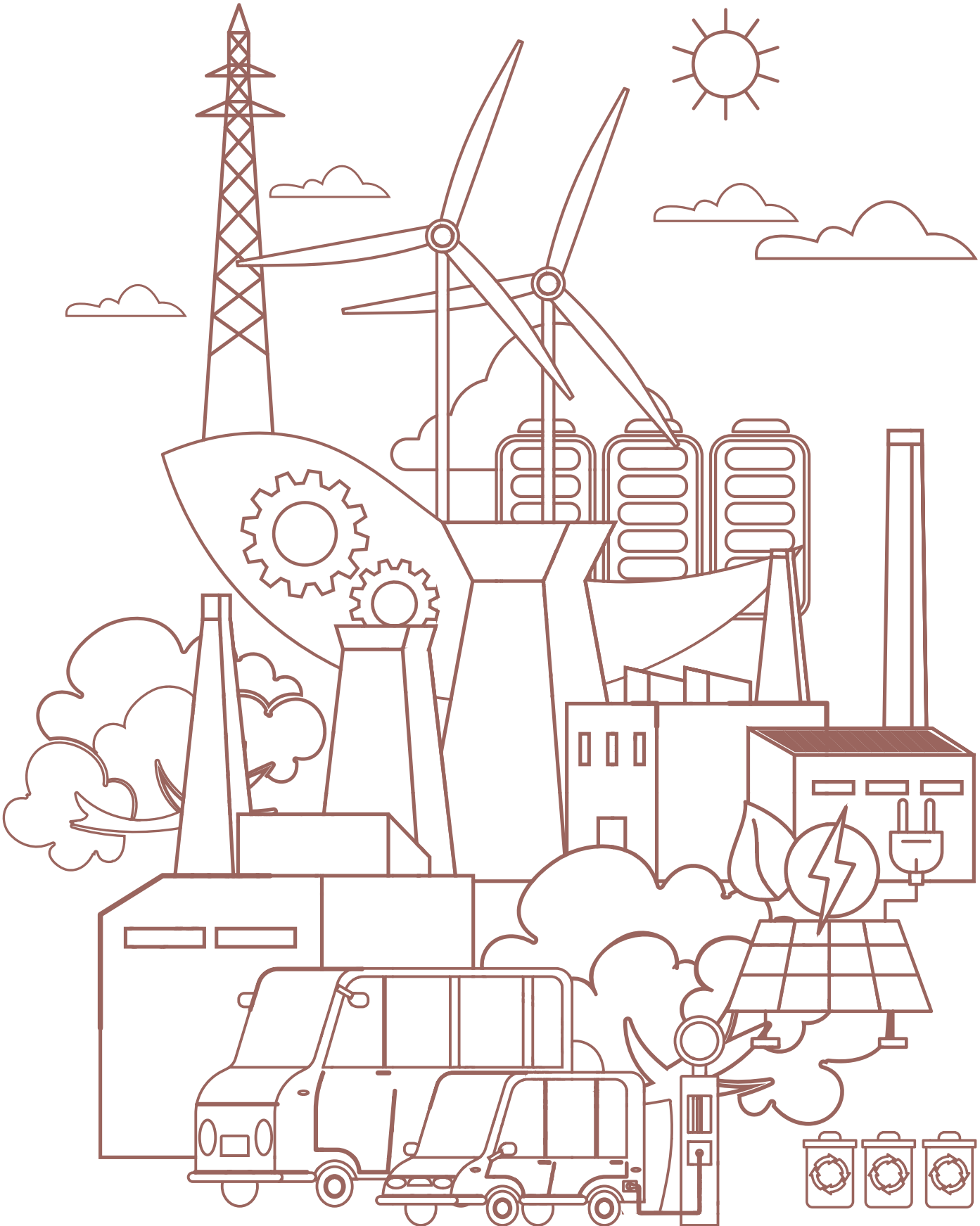
Key enablers for growth and continuity

- Strong market demand for data-driven, low-carbon and resource efficient farming
- Robust digital ecosystem with solutions such as Smart Farming, AgriCore and SenzAgro Connect
- Additional revenue and scaling potential enabled through partnerships with agribusinesses and development agencies

Lessons learnt

Scaling circular innovations requires helping farmers improve their digital skills, ensuring affordability, and providing simple, user-friendly solutions backed by shared systems and strong partnerships. SenzAgro demonstrates a working sharing economy model for scaling climate resilient productivity tools without placing a heavy financial burden on smallholders. Ultimately, blending circular asset management with accessible digital tools and connecting to premium markets is a sustainable way to build profitable, climate resilient food systems.

Processing, packaging and distribution



Amazon Trading Pvt LTD

Conventional tea supply chain → Value added organic tea system

Stage: **Processing, packaging and distribution**

Initiated: **2003**

Location: **Sri Lanka and UK**

CIRCULAR APPROACH:

CIRCULAR INPUTS, RESOURCE EFFICIENCY, REGENERATIVE AGRICULTURE

FINANCED BY:

INTERNAL FUNDS+COMMERCIAL LOANS+ RESPONSABILITY INVESTMENTS

CIRCULAR REVENUE SHARE:

100%

PREMIUM PRICE:

~USD 40/KG

MARGIN IMPROVEMENT:

7%

Description of business activity

Amazon Trading Pvt LTD (The English Tea Shop) replaces extractive auctions with a shared value circular model. By sourcing directly from over 3,000 smallholders, the company ensures full traceability across a 100% organic supply chain, supporting soil health and potential carbon sequestration benefits. This vertical integration, coupled with Open Book Management (OBM) and Employee Share Ownership (ESOP), embeds transparency and ensures premium market gains are distributed equitably, securing both supply resilience and operational efficiency.

Investment and operational highlights

Metric	Traditional model	Circular model
Input use	Sensitive to fertiliser prices	100% organic inputs
Energy costs	Grid dependent	~60% reduction with solar energy
Revenue model	Commodity pricing via auction	Premium branded exports
Governance	Siloed financial data	OBM; 77% ESOP
Packaging	Conventional plastic/nylon	Fully Biodegradable and recyclable

Financial impact

Cost advantage achieved through solar energy investments (~LKR 67.5 Mn), reducing grid electricity consumption by ~60%

Higher revenues generated through premium export pricing (8–10%) across international markets

Higher supply demonstrated through an estimated payback period of approximately 6 months

Margin improvement of approximately 7% driven by premium positioning and value-addition

Enhanced supply chain efficiency through integration of 3000+ farmers and transparent value-sharing mechanisms

31% improvement in productivity without new technology investments by empowering staff through financial transparency

Environmental impact

- Active habitat protection for pollinators and erosion prevention through chemical-free farming supporting soil health and biodiversity, contributing to carbon sequestration
- Transition to biodegradable tea bag materials and fully recyclable packaging

Social impact

- 77% participation in ESOP, with significant female representation in the workforce
- Higher income generated for 3,000+ farmers through premium pricing above Fairtrade minimums, incentivising a conformity to organic agriculture

Key enablers for growth and continuity

- Operates within a global organic tea market projected to reach USD 2.81 Billion by 2031 (12.18% CAGR)
- Significant internal investments in renewable energy and sustainable packaging
- Continual internal training and farmer education programs to secure the future supply of organic produce

Lessons learned

Scaling circular models in global value chains requires deep integration across stakeholders, supported by transparency, shared ownership, and long-term investment. Premium value creation, rather than volume based competition, is critical to sustaining profitability and impact.

Hakwatunawa Wewa Smoked Fish Initiative

Surplus fish harvest → Value added fish products

Stage: **Processing, packaging and distribution**

Initiated: **2023**

Location: **Kurunegala District**

CIRCULAR APPROACH:
PRODUCT LIFE EXTENSION, SHARING ECONOMY

FINANCED BY:
GCF + GOVERNMENT OF SRI LANKA

COST ADVANTAGE:
REDUCTION IN POST-HARVEST FISH LOSSES

ADDITIONAL PROFITS:
LKR 700–1,000 PER PROCESSING BATCH

SCALE:
50 FISHERMEN

Description of business activity

The Hakwatunawa Wewa initiative converts surplus fresh fish into smoked fish products to reduce waste and extend product shelf life. Fish that would otherwise remain unsold during peak harvest periods are processed through smoke drying ovens constructed with project support. This value addition process improves resource efficiency while reducing dependency on low-price intermediaries. By integrating preservation techniques with sustainable fishing practices, the initiative strengthens livelihood resilience and creates a more stable community based fisheries system.

Investment and operational highlights

Metric	Traditional model	Circular model
Fish surplus	Discarded or sold at low prices	Preserved and value-added
Product shelf life	Short-term fresh fish sales	Extended through smoking
Revenue streams	Fresh fish only	Fresh + smoked fish products
Market dependency	High reliance on intermediaries	Improved bargaining power
Resource efficiency	High post-harvest losses	Reduced waste and higher utilisation

Financial impact

Cost advantage achieved through reduction of post-harvest losses and improved utilisation of surplus fish harvests

Value addition enabled through conversion of 5 kg of fresh fish into 1 kg of smoked fish sold at ~LKR 2,500

Profitability improvement demonstrated through additional profits of ~LKR 700–1,000 per processing batch

Community enterprise development supported through collective processing and shared infrastructure systems

Environmental impact

- Significant reduction in fish wastage through preservation and value-addition practices
- Improved resource efficiency and strengthened fish stock management from existing harvests, reducing pressure on fisheries resources
- Promotion of sustainable fishing practices through regulated net sizes

Social impact

- Creation of more stable, resilient and diversified income streams for fishing households
- Empowerment of fishing communities through collective enterprise development
- Enhanced bargaining power and entrepreneurial capacity within vulnerable rural communities

Key enablers for growth and continuity

- Financial and infrastructure support from the GCF CRIWMP Project
- Technical support from the National Aquaculture Development Authority (NAQDA)
- Strong collaboration through the local fishermen's society
- Training on fish preservation, sustainable fishing, and livelihood diversification
- Community participation and collective implementation mechanisms

Lessons learnt

The initiative demonstrates that low cost circular innovations can significantly reduce waste while improving income stability and community resilience. Small scale value addition, supported through institutional partnerships and collective community action, can transform vulnerable fishing communities into sustainable and economically resilient circular enterprises.

Hathamunagaala Circular Paper Initiative

Invasive grass → Paper products

Stage: **Processing, packaging and distribution**

Initiated: **2025**

Location: **Matale District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, WASTE-TO-VALUE, COMMUNITY BASED CIRCULAR PRODUCTION

FINANCED BY:
GCF+GOVERNMENT OF SRILANKA

CIRCULAR REVENUE SHARE:
100%

INCOME GENERATION:
~LKR 30,000 PER PERSON

COST ADVANTAGE:
RAW MATERIAL COST ELIMINATION

Description of business activity

The Hathamunagaala operates within the environmentally sensitive Knuckles buffer zone periphery. Local producers harvest invasive weed Guinea grass (Panicum maximum) in their agricultural fields and other lands and process it into premium biodegradable paper and value-added handicrafts (stationery, souvenirs, and artisanal crafts). To ensure complete circularity, all organic slurry and fibre processing residues are captured and recycled into high nutrient organic fertiliser. By linking local producers to tourist and sustainable consumer markets, the model transforms environmental waste into economic opportunity.

Investment and operational highlights

Metric	Traditional model	Circular model
Raw material use	Virgin/ synthetic materials	100% free invasive weed grass biomass
Weed management	High recurring maintenance/ herbicide costs	Zero-cost raw material harvesting
Waste generation	Chemical sludge and polluting factory runoff	Closed-loop recycling into fertiliser
Income streams	Single (Agriculture income)	Multiple value-added products
Customer value proposition	Conventional paper	Biodegradable paper

Financial impact

Cost advantage achieved through utilisation of invasive grass as a low-cost raw material while reducing weed management expenses for nearby farms, roadside and other lands

Value creation enabled through conversion of waste biomass into value added products

Income generation supported through stable monthly earnings of ~LKR 30,000 for participating households

Operational efficiency enhanced through recycling of all production residues/effluents into organic fertiliser

Environmental impact

- Systematic harvesting controls the spread of invasive green grass, protecting native flora and natural ecosystems in the vicinity
- Recycling of production residues as organic fertiliser supports soil health
- Promotion of biodegradable paper products reduces the dependence on synthetic high energy demand alternatives

Social impact

- Creation of livelihood opportunities for 25+ rural women entrepreneurs
- Education of 1,300+ students and direct training of 170+ students in sustainable production practices
- Strengthened youth entrepreneurship through school-based circular initiatives

Key enablers for growth and continuity

- Strong partnerships and support from the GCF Knuckles Project, Industrial Technology Institute and the Entrepreneur Development Authority
- Strong involvement of schools and students in innovation and scaling activities
- Growing demand for sustainable and biodegradable products

Lessons learnt

The initiative demonstrates that resilient circular value chains do not require expensive, high-tech machinery and advance technology. Instead, success comes from creatively turning local waste into valuable raw materials. By combining deep grassroots community ownership with structured institutional backing, the model connects rural micro-enterprises directly to high-paying, eco-conscious markets.

Kiruwanaganga Tea Factory

Conventional tea processing → Circular and low carbon manufacturing products

Stage: **Processing, packaging and distribution**

Initiated: **2019**

Location: **Matara District**

CIRCULAR APPROACH:
CIRCULAR INPUTS, RESOURCE EFFICIENCY, CLOSED-LOOP SYSTEMS

FINANCED BY:
INTERNAL FUNDS

INPUT SAVINGS:
10% REDUCTION IN RAW MATERIAL COST

WATER SAVINGS:
34%

GHG EMISSION REDUCTION:
23%

Description of business activity

Kiruwanaganga Tea Factory operates a resource-efficient manufacturing system designed with circular principles from inception. To eliminate the heavy land footprint typical of traditional factories, the facility was completely rebuilt on its existing footprint that required 0% new land clearing. The processing infrastructure integrates on-site rooftop solar arrays, automated climate controls, and AI-driven process optimisation to drastically cut energy consumption during the intense drying and rolling phases. The factory also features built-in rainwater harvesting networks paired with deep groundwater recharge wells, turning a linear water usage model into a closed-loop biological system.

Investment and operational highlights

Metric	Traditional model	Circular model
Factory construction	Land-intensive development	Compact low-carbon vertical design
Energy use	Conventional electricity	90% solar-supported energy use
Water management	Linear consumption	Circular rainwater harvesting system
Material use	High waste generation	Reuse and resource optimisation
Production efficiency	Conventional processing	AI-enabled automation and optimisation

Financial impact

Cost advantage achieved through reduction of raw material waste by 5–10% and finished product losses by approximately 1%

Operational continuity ensured through uninterrupted production during the transition and construction phase

Efficiency gains driven by AI-enabled systems and automation improving resource productivity

Market value enhancement supported by improved buyer interest and potential premium pricing for sustainably produced tea

Environmental impact

- 0% land clearing by rebuilding on the same site within a sensitive ecological zone Deniyaya region
- Water savings up to 34% through rainwater harvesting and groundwater recharge
- 23% reduction in GHG emissions through low-carbon construction design
- Lower energy consumption through solar integration and energy-efficient technologies

Social impact

- Secures 40+ direct factory jobs, supporting over 400 estate workers, and stabilising incomes for over 2,500 smallholder families
- Contribution to industry benchmarking for sustainable tea manufacturing

Key enablers for growth and continuity

- Strong leadership commitment and long-term sustainability vision in operations
- Technical support from Tea Research Institute of Sri Lanka and collaboration with engineering, construction, and private sector partners
- Growing market demand for sustainably produced tea

Lessons learnt

Circular transformation in traditional industries is highly achievable when integrated from the design stage. While the initial 10–15% green premium on CapEx is high, long-term benefits in efficiency, resilience, and market positioning outweigh these costs. Strong leadership, technical collaboration, and maintaining product quality are critical to sustaining trust and achieving scalable circular manufacturing systems.

Moveflex Pvt LTD

Traditional logistics → Optimised logistics and reduced emissions

Stage: **Processing, packaging and distribution**

Initiated: **2021**

Location: **Colombo District**

CIRCULAR APPROACH:
PRODUCT-AS-A-SERVICE, SHARING ECONOMY

FINANCED BY:
INTERNAL FUNDS+LOANS

CIRCULAR REVENUE SHARE:
20%

REDUCTION IN TRANSPORT COSTS:
10%

MARGIN IMPROVEMENT:
12%

Description of business activity

Moveflex operates a sharing economy ecosystem that allow businesses to subscribe to logistics systems rather than maintaining costly, underutilised fleets. The digital platform facilitates back-haulage and optimised routing, eliminating empty miles, reducing fuel waste and carbon emissions. The integrated Cold Storage-as-a-Service system uses First Expiry First Out (FEFO) management, extending product life and minimises food spoilage, ensuring that the service provides both economic value and environmental resilience.

Investment and operational highlights

Metric	Traditional model	Circular model
CapEx	High (Owning fleets and cold storage)	Zero/Low (Accessing shared infrastructure)
Transport efficiency	High empty return trips	Optimised routing and back haulage
Revenue streams	Single (transport services)	Multiple (transport, cold storage and tech services)
Waste	Disposal oriented	Reduced through cold storage and FEFO
Customer value proposition	Basic transport	Cost savings, efficiency, and reduced losses

Financial impact

Cost advantage achieved with a 10% reduction in transport expenses for customers

Additional revenue generation and margin improvement by 12% enabled through integrated transport and cold storage services, generating ~LKR 7 Mn per month

Value to customers created through reduced spoilage, improved inventory management, and efficient logistics solutions

Higher operational efficiency driven by integrated systems that enhance asset utilisation and supply chain performance

Environmental impact

- Reduction in carbon emissions through optimised routing and improved vehicle utilisation
- Decrease in food waste through cold storage and FEFO-based inventory management

Social impact

- Enhanced connectivity for drivers and transporters leading to a steady stream of income from corporate clients
- Creation of specialised roles for pickers and warehouse staff in rural regions

Key enablers for growth and continuity

- Technological innovation in logistics and supply chain systems
- Increasing market demand for efficient and sustainable logistics solutions
- Strong top management commitment and environmental focus

Lessons learnt

Transitioning to a sharing economy model in logistics requires high initial trust and technological investment. In an era of volatile fuel prices and urban congestion, Moveflex demonstrates that the path to profitability is paved with resource mindfulness, stabilising supply chains and reducing the total infrastructure strain for businesses.

Novateq Pallets Pvt LTD

Waste wood → Sustainable packaging solutions

Stage: **Processing, packaging and distribution**

Founded: **2021**

Location: **Colombo District**

CIRCULAR APPROACH:
CIRCULAR INPUTS, RESOURCE RECOVERY

FINANCED BY:
INTERNAL FUNDS+BANK LOANS

CIRCULAR LINKED REVENUE SHARE:
100%

OPERATIONAL EFFICIENCY:
60%
SPACE SAVINGS

SCALE:
35,000+
PALLETS SOLD

Description of business activity

Novateq Pallets collects waste wood and sawdust and upcycles them into sustainable pallets. This approach repurposes materials reducing dependence on virgin wood and plastic, reducing overall material consumption in pallet production. In addition, Novateq Pallets ensures its products are recyclable at the end of their lifecycle, reinforcing a closed-loop system that supports long-term sustainability and responsible resource management.

Investment and operational highlights

Metric	Traditional model	Circular model
Input price volatility	High and volatile	Low and predictable
Revenue streams	Single (product sales)	Multiple (product and waste valorisation)
Waste	Lost value	Monetised
Supply risk	Dependence on timber or plastic	Diversified waste streams
Customer value proposition	Functional only	Cost savings, sustainability and efficiency

Financial impact

Cost advantage due to use of waste-based inputs that lower raw material costs and reduce exposure to timber and plastic price volatility

Additional revenue generated from diversification across tea, apparel, rubber, coir sectors and other export markets

Value to customer created due to 60% space savings and improved handling efficiency that drive repeat adoption

Higher supply chain resilience as diversified waste streams mitigate supply risks

Environmental impact

- Sales of over 35,000 pallets that upcycled approximately 17 kg of sawdust per pallet, contributing to large-scale waste diversion
- Conservation of natural resources, with an estimated 6,000 trees saved from being cut

Social impact

- Creation of employment opportunities within the local community
- Contribution to improved livelihoods in surrounding areas

Key enablers for growth and continuity

- Customer willingness to adopt alternative and sustainable pallet solutions
- Continuous product and process innovation
- Strong internal management and supply chain strategy
- Availability of a consistent waste wood supply
- Lifetime warranty against mould and pests giving significant advantage over traditional wood pallets

Lessons learnt

Novateq highlights that perseverance and resilience are critical for circular innovation. Moving from a waste based concept to a market leading product requires not just technical skill, but the strategic patience to build new supply chains and shift deep seated industry mindsets regarding recycled products.

Renewable Energy for SMEs Initiative

Conventional energy dependence → Hybrid renewable energy systems

Stage: **Processing, packaging and distribution**

Initiated: **2025**

Location: **Nuwara Eliya District**

CIRCULAR APPROACH:
RENEWABLE ENERGY INTEGRATION, RESOURCE EFFICIENCY, RESILIENT ENERGY SYSTEMS

FINANCED BY:
JAPANESE SUPPLEMENTARY BUDGET

CIRCULAR REVENUE SHARE:
EMBEDDED WITHIN SME OPERATIONS

ENERGY COST SAVINGS:
70%

BENEFICIARIES:
100 SMES

Description of business activity

The initiative introduced hybrid renewable energy systems integrating solar panels, battery storage, and grid connectivity to improve energy reliability and resource efficiency for SMEs. Solar energy generated during the day is directly utilised for operations, while excess energy is stored in batteries for later use, reducing dependence on conventional grid electricity. The system ensures uninterrupted production during power disruptions, particularly for milk processing, bakery, and other energy-sensitive enterprises. By optimising renewable energy utilisation and minimising energy waste, the initiative strengthens the resilience and sustainability of local business ecosystems.

Investment and operational highlights

Metric	Traditional model	Circular model
Energy source	Conventional grid electricity	Hybrid solar + battery + grid
Power reliability	Frequent disruptions	Continuous backup-supported supply
Operating costs	High electricity dependency	Reduced energy expenditure
Resource utilisation	Linear energy consumption	Renewable and stored energy cycles
Business continuity	Vulnerable to outages	Improved operational resilience

Financial impact

Cost advantage achieved through approximately 70% reduction in electricity expenses leading to monthly electricity bill reductions of approximately LKR 15,000 per beneficiary

Business continuity strengthened through uninterrupted production during power outages and extreme weather conditions

Resource efficiency improved through solar energy storage and optimised energy utilisation

Environmental impact

- Reduced carbon emissions through renewable energy adoption
- Increased renewable energy generation capacity reducing dependence on conventional electricity sources
- Reduced reliance on fuel wood and other environmentally intensive energy alternatives
- Promotion of sustainable and low-emission production systems

Social impact

- Improved livelihood stability for beneficiary households and SME workers
- Increased income security through uninterrupted employment opportunities
- Strengthened community resilience through access to reliable energy infrastructure
- Enhanced awareness and acceptance of renewable energy technologies

Key enablers for growth and continuity

- Funding support through the Japanese Supplementary Budget (JSB) recovery initiative
- Technical implementation by UNDP climate and energy teams
- Monitoring and coordination support from the Divisional Secretariat Office

Lessons learnt

The initiative demonstrates that circular energy transitions require not only technological innovation but also institutional coordination and behavioural change. Renewable energy systems can significantly strengthen local economic resilience while reducing dependency on finite energy resources. Awareness creation, demonstration projects, and technical capacity-building are critical for overcoming resistance to new technologies and ensuring long-term sustainability.

Utech Technologies Pvt LTD

Conventional agriculture and cold chain systems → Smart and resource-efficient cold chain systems

Stage: **Processing, packaging and distribution**

Founded: **2018**

Location: **Colombo District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, CIRCULAR INPUTS, PRODUCT-AS-A-SERVICE

FINANCED BY:
INTERNAL FUNDS + GRANTS

ENERGY COST SAVINGS FOR CUSTOMER:
10%

WATER COST SAVINGS FOR FARMER:
30%

PAYBACK PERIOD:
AGRICULTURE DEVICE: **<2.0 YEARS**
COLD CHAIN AND ENERGY MONITORING SYSTEM: **<2.5 YEARS**

Description of business activity

UTech is an Industrial internet of things (IoT) firm that integrates proprietary hardware with real-time analytics. The company works in agriculture and logistics, delivering smart monitoring solutions designed to minimise significant waste inefficiencies in the cold chain, reduce energy usage in industrial settings, and enable farmers to manage water more precisely.

Investment and operational highlights

Metric	Traditional model	Circular model
Resource use	Inefficient plastic and water use	PET recovery and precision water management
Revenue streams	Direct hardware sales	Multiple (device sales, SaaS subscription and monitoring)
Waste	Plastic waste and food loss	Reduced through reuse and monitoring
Input efficiency	High losses	Improved water and storage efficiency
Customer value proposition	Standard equipment	Sustainability, risk mitigation and data insights

Financial impact

Cost advantage achieved through reduced energy usage, water usage and lower cold chain operating costs

Additional income generation enabled through agriculture applications, generating approximately LKR 60,000 per month

Value to customers created through improved productivity, reduced losses, and affordable technology solutions

Higher resource efficiency driven by integration of waste materials and smart monitoring systems

Environmental impact

- Systematic reuse of PET materials for agricultural infrastructure
- Real-time monitoring of refrigerators reduces the tonnage of perishable food wasted due to temperature fluctuations
- Significant water savings through smart channeling, vital for climate-resilient farming in dry zones

Social impact

- Empowerment of smallholder farmers (less than 1 acre)
- Creation of agripreneur opportunities (farming and additional income)
- Contribution to rural economic development

Key enablers for growth and continuity

- Strong social mission and sustainability-driven mindset
- Innovation in low-cost agricultural and logistics solutions
- Growing demand for efficient farming and cold chain systems
- Potential for large-scale adoption across agricultural markets

Lessons learnt

Utech's journey highlights that limited capital does not mean limited access to Circular Economy. By focusing on gradual scaling and solving critical social bottlenecks, innovative circular models can achieve long-term financial viability while delivering environmental and social returns.

Retail and consumption



Go-Eco Products

Invasive water hyacinth → Eco-friendly handicrafts products

Stage: **Retail and consumption**
Scale: **5 women groups**
Location: **Anuradhapura District**

CIRCULAR APPROACH:
RESOURCE RECOVERY
FINANCED BY:
GCF + GOVERNMENT OF SRILANKA

CIRCULAR REVENUE SHARE:
EMBEDDED WITHIN HANDICRAFT PRODUCTION OPERATIONS

ADDITIONAL MONTHLY INCOME GENERATED FOR PARTICIPATNG WOMEN:
~LKR 3,000–12,000

Description of business activity

Go-Eco Products converts invasive aquatic agricultural weeds, particularly water hyacinth *(Eichhornia crassipes)*, into eco-friendly handicraft products including bags, mats, decorative items, and woven products. Water hyacinth collected from irrigation tanks and water bodies within the Palugaswewa cascade system is processed, dried, and woven using traditional handicraft techniques. The initiative combines environmental restoration with women-led livelihood development by transforming biological waste into marketable products. Products are sold through social media channels and tourism-related markets targeting visitors to the Habarana region.

Investment and operational highlights

Metric	Traditional model	Circular model
Aquatic weeds	Environmental burden	Converted into handicraft raw material
Resource use	Unmanaged biological waste	Circular resource recovery
Livelihoods	Limited rural income opportunities	Women-led eco-enterprise development
Production system	Conventional handicrafts	Sustainable and biodegradable products
Market access	Limited local sales	Tourism and social media-based markets

Financial impact

Cost advantage achieved through use of low cost invasive aquatic weeds as the primary production material

Income generation enabled through additional monthly earnings of ~LKR 3,000–12,000 for participating women

Resource efficiency strengthened through productive utilisation of unmanaged biological waste

Market diversification supported through eco-product branding and tourism-oriented sales channels

Environmental impact

- Removal and productive utilisation of invasive water hyacinth from irrigation systems
- Improved water flow, sunlight penetration, and ecological balance within cascade water bodies
- Promotion of biodegradable and environmentally friendly handicraft products
- Reduced environmental degradation caused by unmanaged aquatic weed growth

Social impact

- Strengthened women's empowerment and participation in community-level economic activities
- Preservation and promotion of traditional weaving and handicraft skills
- Creation of climate-resilient livelihood opportunities for vulnerable rural women

Key enablers for growth and continuity

- Support from the Climate Smart Agriculture Programme under CRIWMP, GCF
- Technical training in handicraft production, weaving, and business development
- Community acceptance and existing traditional handicraft knowledge
- Access to tourism markets in the Habarana region

Lessons learnt

The initiative demonstrates that invasive aquatic challenges can be transformed into sustainable livelihood opportunities through women-led Circular Economy approaches. Technical training, market access, and business development support are critical for strengthening rural women's economic empowerment. Combining traditional community skills with sustainable resource recovery and modern marketing creates resilient and environmentally responsible, Circular Business Models.

Halpita Community Enterprise

Homegrown surplus produce → Organic value added products

Stage: **Retail and consumption**
Initiated: **2024**
Location: **Colombo District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, SHARING ECONOMY, REGENERATIVE AGRICULTURE

FINANCED BY:
INTERNAL FUNDS + UNDP GRANT + HDFSL

CIRCULAR LINKED REVENUE SHARE:
100%

COST ADVANTAGE:
SHARED MACHINERY AND COMPOST PRODUCTION

SCALE:
15
WOMEN-LED MICRO-ENTERPRISES

Description of business activity

Halpita Community Enterprise comprises of 15 home garden women farmers. The farmers compost kitchen and garden waste to create organic fertiliser. A shared processing hub allows members to access small scale processing machinery and to share energy costs. The enterprise sells the organic produce for a premium at the Good Market in Colombo by sharing transport and stall costs and redistributes profits to members.

Investment and operational highlights

Metric	Traditional model	Circular model
Agricultural surplus	Wasted or underutilised	Converted into value-added products
Waste management	Disposal of organic waste	Closed loop composting and soil reintegration
Production costs	High (capital intensive)	Low (shared facilities)
Market access	Limited local sales	Sustainable market channels

Financial impact

Cost advantage achieved through shared processing machinery and use of compost based organic inputs, reducing production and capital costs

Profitability improvement demonstrated through weekly earnings of ~LKR 50,000 –70,000 and a 50% increase in profitability compared to previous sales channels

Value retention created by converting surplus and low-value agricultural outputs into shelf-stable certified organic products

Market integration strengthened through partnerships with Good Market, enabling access to sustainable consumer markets

Environmental impact

- Reduced chemical dependency through regenerative and organic farming practices
- Closed-loop utilisation of kitchen and garden waste as compost inputs
- Reduction of food and agricultural waste through value addition and resource recovery
- Promotion of localised, low-impact production and sustainable land practices

Social impact

- Strengthened women's economic participation through community-based micro-enterprises
- Creation of flexible livelihood opportunities for low-income households
- Improved community resilience through collaborative production systems
- Increased consumer access to sustainable and healthy food products

Key enablers for growth and continuity

- Multi-stakeholder partnerships with Good Market, UNDP and Human Development Foundation Sri Lanka (HDFSL), and agricultural officers
- Growing consumer demand for sustainable and healthy products
- Community collaboration and local resource integration

Lessons learnt

This model demonstrates that circularity can be achieved at the micro-scale without high investments. Sharing Economy and Resource Recovery approaches illustrates scalable circular models in which community assets and waste support a sustainable food system that generates economic returns for women.

Heritance Kandalama

Linear hospitality → Circular and smart hospitality

Stage: **Retail and consumption**
Founded: **1995**
Location: **Matale District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, CIRCULAR HOSPITALITY

FINANCED BY:
INTERNAL FUNDS

COST SAVINGS:
~40% THROUGH BIOMASS GASIFIER SYSTEM

FOOD WASTE REDUCTION:
~30%

Description of business activity

Heritance Kandalama integrates Circular Economy practices through food waste reduction, renewable energy, water recycling, and resource recovery systems. The hotel adopts a Just-in-Time (JIT) buffet model to minimise surplus food, while food by-products are upcycled into jams and marmalades supplied within the Aitken Spence hotel chain. Organic food waste is redirected to a local piggery, wastewater is recycled for gardening and staff facilities, and biomass gasifiers support renewable energy generation.

Investment and operational highlights

Metric	Traditional model	Circular model
Buffet preparation	100% prepared upfront	50% staged JIT production
Food waste	~30% buffet surplus	Near-zero end-of-service surplus
Organic waste	Landfilled	Resource recovery through piggery
Energy source	Diesel-based	Biomass gasifier + renewable systems
Water management	Linear consumption	100% wastewater reuse

Financial impact

Cost advantage achieved through biomass gasifier systems reducing operating costs by approximately 40%

Waste reduction enabled through JIT buffet systems eliminating the typical 30% food surplus common in hotels

Resource efficiency improved through yield optimisation and upcycling of fruit by-products into value-added products

Operational sustainability strengthened through 100% wastewater recycling and renewable energy integration

Market diversification supported through supply of jams and marmalades to hotels in Sri Lanka and the Maldives

Environmental impact

- Reduction of buffet food waste
- 100% wastewater reuse for gardening and staff facilities
- Elimination of organic waste disposal through piggery-based recovery systems

Social impact

- 55–60% of employees recruited from within a 20 km radius
- Hotel school partnership graduating approximately 60 village students annually
- Strengthened local livelihoods through sourcing from 12 village suppliers

Key enablers for growth and continuity

- Staff training on yield optimisation and waste minimisation
- Smart inventory systems linked with central sourcing operations
- Long-term partnerships with local suppliers and recovery networks
- Growing demand for sustainable tourism and circular hospitality models

Lessons learnt

The case highlights that waste reduction, resource recovery, and community integration can improve profitability, operational efficiency, and long-term sustainability in hospitality operations.

Jetwing Lake

Linear hospitality → Circular hospitality

Stage: **Retail and consumption**
Founded: **1973 (Jetwing Lake: 2017)**
Location: **Matale District**

CIRCULAR APPROACH:
CIRCULAR INPUTS, RESOURCE RECOVERY, CLOSED-LOOP SYSTEMS

FINANCED BY:
INTERNAL FUNDS

LPG REDUCTION:
~900KG ANNUALLY

SOLID WASTE DIVERSION:
90%

SCALE:
LARGE-SCALE HOSPITALITY OPERATIONS WITH PROPERTY-LEVEL CIRCULAR YSTEMS

Description of business activity

Jetwing Lake rethinks how resources are used and reused across its operations in hospitality. The hotel eliminates single-use plastics through an on-site glass bottling plant and ensures 100% wastewater treatment for non-potable reuse such as irrigation. Organic waste is diverted into biogas digesters or composting units, creating a feedback loop where waste from the kitchen returns as energy or soil nutrients for the property's gardens. The hotel adopts procurement practices that prioritise local and lower-impact inputs, creating additional incomes for local communities.

Investment and operational highlights

Metric	Traditional model	Circular model
Resource use	High (reliance on virgin inputs)	Biodegradable and locally sourced inputs
Waste management	External disposal (cost centre)	Internalised recovery (energy/ fertiliser)
Energy use	Fossil fuel and grid dependent	Renewable energy (Biogas, biomass and solar)
Water use	High freshwater dependency	On-site treatment and reuse systems
Customer value proposition	Standard hospitality	Sustainable and eco-luxury hospitality

Financial impact

Cost advantage achieved through energy recovery and reduced resource consumption across water, materials, and fuel

Operational efficiency enhanced through on-site waste segregation, composting, and wastewater reuse systems

Energy substitution enabled through biogas systems processing ~4,000 kg of food waste per month, replacing ~900 kg of LPG annually

Supply chain alignment strengthened through procurement of locally sourced and lower-impact materials

Environmental impact

- Drastic reduction in the carbon footprint per guest night through the use of biomass boilers for laundry and hot water
- Over 90% of solid waste diverted from landfills
- 100% of treated wastewater reused for landscaping, protecting local groundwater tables in the dry zone

Social impact

- Strengthened employee awareness and engagement through continuous training programmes
- Established the hotel as a benchmark for sustainable tourism, influencing consumer behaviour and industry standards
- Indirect community impact through reduced environmental footprint and responsible sourcing

Key enablers for growth and continuity

- Strong internal management commitment to sustainability and integration of circular practices into core operations rather than standalone initiatives
- Increasing consumer demand for sustainable hospitality experiences
- Supplier engagement to improve availability of sustainable and locally sourced inputs

Lessons learnt

Circularity is a primary risk mitigation strategy for the modern hospitality sector. While initial CapEx is significant, circular practices secures long-term returns by insulating the business from utility price hikes and supply chain shocks. By integrating sustainable infrastructure into the core guest experience, the hospitality sector can capture the growing global demand for authentic, low impact travel.

Riviera Eastern Enterprises Pvt LTD

Hospitality waste and energy → Circular resource management

Stage: **Retail and consumption**
Founded: **1981**
Location: **Batticaloa District**

CIRCULAR APPROACH:
CIRCULAR INPUTS, RESOURCE RECOVERY, PRODUCT LIFE EXTENSION

FINANCED BY:
INTERNAL FUNDS + COMMERCIAL LOANS

COST SAVING:
~LKR 200,000 (SOLAR)
10% (LPG)

PAYBACK PERIOD:
60 MONTHS (BIOGAS)

CASH FLOW IMPROVEMENT:
~4%

Description of business activity

Riviera Resort transformed its operations from a conventional hospitality model into a resource efficient and circular system. At the centre of this approach is a combination of solar energy and a biogas system that converts around 70% of kitchen waste into cooking fuel. This extends into regenerative agriculture, where organic waste and compost generated are used within internal farming systems. The resort prioritises repair, maintenance, and refurbishment practices to extend the life of equipment and assets, reducing replacement expenses. The resort has also explored innovations such as biochar production to enhance soil carbon sequestration.

Investment and operational highlights

Metric	Traditional model	Circular model
Energy use	Fossil fuel dependent	Solar and biogas based
Waste	Disposed to environment	Converted into energy
Revenue streams	Room nights and service income	Room nights + sustainability premiums
Resource efficiency	High consumption/ low efficiency	High efficiency
Customer value proposition	Standard hospitality	Sustainable and eco-conscious experience

Financial impact

Cost advantage achieved through solar energy savings and reduced LPG consumption

Additional revenue LKR 200,000 per month generated through sustainability-driven initiatives

Value to customers created through eco-friendly hospitality experiences

Operational efficiency improved through integrated energy and waste systems

Environmental impact

- 70% of kitchen waste is diverted from landfills and converted into biogas
- Reduced carbon emissions through solar energy usage
- Lower reliance on fossil fuels and reduced food waste
- Reduced environmental burden through product life extension of equipment

Social impact

- 60% female workforce promoting gender inclusion in the Eastern Province
- Increased awareness among guests and the community on sustainability practices

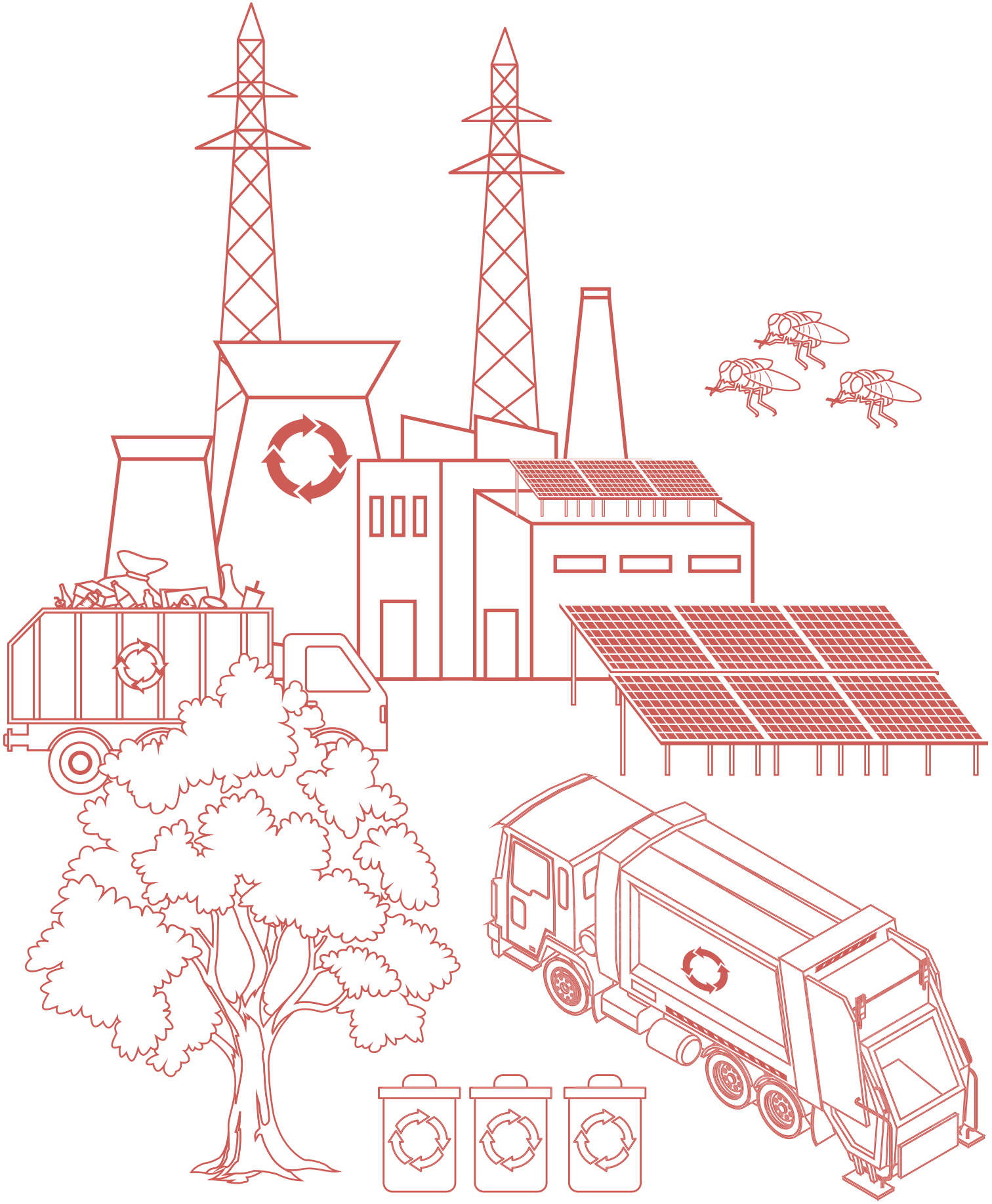
Key enablers for growth and continuity

- Strong environmental commitment and internal management support
- Technological innovation in renewable energy systems
- Regulatory support and industry alignment
- Integration of supply chain and internal resource systems

Lessons learnt

Circularity in hospitality is as much about human capital as it is about technology. Riviera highlights that successful implementation requires continuous staff training and deep stakeholder engagement to ensure that sustainable practices are embedded in the daily culture of the resort.

Waste Management



Bio Fuel Lanka

Food waste and used oil → Biogas and biodiesel

Stage: **Waste Management**
Founded: **2007**
Location: **Colombo District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, WASTE-TO-ENERGY SYSTEMS, CIRCULAR EXCHANGE

FINANCED BY:
INTERNAL FUNDS

CIRCULAR LINKED REVENUE SHARE:
~100%

PAYBACK PERIOD FOR CUSTOMER:
2–3 YEARS

COST ADVANTAGE FOR CUSTOMER:
REDUCED LPG DEPENDENCY (~ONE CYLINDER/DAY)

Description of business activity

Bio Fuel Lanka operates a multi-stream circular model that addresses both solid and liquid waste. The company sells biogas systems that integrate food waste, sewage, and agricultural residues to generate cooking and heating gas. Concurrently, they manage a circular exchange, collecting used cooking oil from the hospitality sector and returning a proportion of it as refined biofuel. The rest being sold as biodiesel for other uses. Biofuel Lanka also refurbishes abandoned third-party biogas plants, re-integrating them into active waste-to-energy loops to maximise existing national infrastructure.

Investment and operational highlights

Metric	Traditional model	Circular model
Waste management	Disposal to landfill	Converted into energy (biogas/ biodiesel)
Energy source	Fossil fuel dependent (LPG/ Diesel)	Renewable energy from waste
Customer value proposition	Variable and rising energy costs	Fixed CapEx with zero cost feedstock and better waste management
Infrastructure use	Idle or underutilised biogas plants	Refurbished and reactivated systems

Financial impact

Cost advantage achieved through conversion of 100 kg of food waste into ~20 kg LPG equivalent, saving roughly one LPG cylinder per day (~LKR 5,000)

Investment efficiency demonstrated through biogas plant installation costs ranging from LKR 3–5 Mn with a payback period of 2–3 years

Revenue diversification enabled through biogas production (70%) and waste management services (30%)

Market demand growth driven by rising fuel prices, increasing adoption among factories, farms, and industrial users

Operational scalability supported through refurbishment of existing non-functional biogas plants and decentralised deployment models

Environmental impact

- Diversion of food waste from landfills and waterways, mitigating methane emissions and water pollution
- Reduction in fossil fuel consumption through biogas generation leading to lower GHG emissions
- Biofuel generation prevents used cooking oil from being dumped into waterways or sold illegally for human consumption

Social impact

- Community empowerment through initiatives such as seaweed cultivation and rural engagement in the North and East
- Support for decentralised energy access at household and institutional levels
- Increased awareness of sustainable waste management practices among communities

Key enablers for growth and continuity

- Increasing demand for alternative energy due to rising fuel and gas prices
- Ongoing improvements in digester efficiency allow for smaller, more urban-friendly footprints
- Applicability across multiple sectors including households, agriculture, and industry

Lessons learnt

This model demonstrates that waste is an under priced energy commodity. The primary barrier to scale is not technology, but feedstock logistics and regulatory clarity. Decentralised energy systems are a viable hedge against inflation, provided there is a reliable supply of waste and a commitment to long-term technical maintenance. Challenges in sourcing used cooking oil and regulatory gaps highlight the need for stronger policy frameworks and monitoring mechanisms.

Gunadamin Elephant House

Plastic waste → Community-based plastic circularity

Stage: **Waste Management**
Initiated: **2022**
Location: **Multiple Districts**

CIRCULAR APPROACH:
RESOURCE RECOVERY, DECENTRALISED RECYCLING, COMMUNITY-BASED CIRCULARITY

FINANCED BY:
INTERNAL FUNDS

CIRCULAR REVENUE SHARE:
EMBEDDED WITHIN PACKAGING RECOVERY OPERATIONS

JOBS CREATED:
250

ADDITIONAL ANNUAL PET RECOVERY:
1,100 TONNES

Description of business activity

Gunadamin Elephant House established a decentralised network of 12 MRFs to strengthen PET plastic collection and recycling across Sri Lanka. The initiative integrates local communities into the recycling value chain by providing collection infrastructure including storage facilities, baling machines, collection bins, e-bikes, carts, and transport support. Waste collectors are trained on sorting, pricing, and plastic value differentiation while being connected directly with certified recyclers. Through this community-based circular system, the initiative improves plastic recovery efficiency, strengthens recycling supply chains, and reduces environmental leakage of plastic waste.

Investment and operational highlights

Metric	Traditional model	Circular model
Plastic waste	Disposed or leaked into environment	Collected, sorted, and recycled
Collection system	Centralised and inefficient	Decentralised community-based
Resource utilisation	Virgin plastic dependency	Increased recycled PET
Community engagement	Limited participation	Inclusive collector networks
Supply chain efficiency	Weak regional recovery systems	Strengthened nationwide collection network

Financial impact

Operational efficiency improved through the establishment of 12 decentralised MRFs linked directly with local collection communities

Resource recovery strengthened through PET collection exceeding 1,100 tonnes during 2025/26 operations

Cost optimisation achieved by reducing transportation inefficiencies and strengthening regional collection systems outside Colombo

Community income generation enabled for families participating in plastic collection activities

Employment creation through ~250 jobs, including women-led operations across four MRF centres

Environmental impact

- Reduced marine and land-based plastic pollution through large-scale PET recovery systems, including in regions outside Colombo
- Improved waste sorting and recycling efficiency, reducing contamination of ecosystems and waterways
- Enhanced circular utilisation of plastic materials, reducing dependence on virgin plastic production

Social impact

- Additional income opportunities created for ~ 600 families involved in collection activities
- Employment generation, including women-led operations
- Increased public awareness on waste management, cleaner cities, and sustainable consumption practices
- Strengthened community participation in decentralised recycling systems

Key enablers for growth and continuity

- Strong multi-stakeholder collaboration involving USAID, MAS Foundation, municipal councils, and Clean Sri Lanka initiatives
- Investment in recovery infrastructure including baling machines, e-bikes, carts, and collection facilities with community mobilisation
- Direct linkages between collectors and certified recyclers

Lessons learnt

The initiative demonstrates that successful circularity requires broad societal participation and decentralised waste recovery systems supported by strong partnerships. Scaling circular solutions depends on collaboration among corporations, communities, policymakers, and consumers to strengthen collection infrastructure and resource recovery systems.

Maheero Banana Fiber Pvt LTD

Banana waste → Sustainable fibre products

Stage: **Waste Management**
Founded: **2022**
Location: **Hambanthota District**

CIRCULAR APPROACH:
RESOURCE RECOVERY

FINANCED BY:
INTERNAL FUNDS

COST SAVINGS:
LOW-COST RAW MATERIALS FROM AGRICULTURAL WASTE

PROFIT MARGIN:
30–35%

BENEFICIARIES:
50 RURAL WOMEN

Description of business activity

Maheero creates fibre products from pseudo-stems that are traditionally discarded by banana farmers after harvesting. This creates an entirely new, secondary stream of income for banana farmers. The harvested trunks are processed into high-tensile natural fibre using completely chemical-free techniques. The extracted fibre is distributed to a network of rural women who craft the material from or near their homes into value added products such as organic rugs, paper, biodegradable packaging, and homeware items.

Investment and operational highlights

Metric	Traditional model	Circular model
Raw material use	Virgin or synthetic materials	Agricultural waste (banana trunks)
Waste	Underutilised or discarded	Recovered and converted into fibre
Revenue streams	Limited product range	Diverse handicrafts and packaging products
Production model	Centralised manufacturing	Decentralised, community-based production
Customer value proposition	Functional products	Sustainable products

Financial impact

Cost savings achieved through utilisation of low-cost agricultural waste as primary raw material

Value addition created by transforming discarded banana trunks into high value fibre based products

Additional income generation enabled for rural women and banana farmers through inclusive supply chains

Market value creation driven by increasing demand for sustainable alternatives to plastic

Environmental impact

- Diversion of tonnes of pseudo-stem waste from being discarded into environment, preventing pollution and GHG emissions
- Displaces single-use plastics and non-recyclable packaging with compostable banana fibre alternatives
- Elimination of chemical use in production, ensuring eco-friendly processes

Social impact

- Creation of livelihood opportunities for 50 rural women and supports income generation (LKR 10,000–20,000 monthly)
- Provision of flexible, home-based work suited to women with care responsibilities
- Strengthens rural community development and social inclusion
- Generation of additional income for banana farmers from agricultural waste

Key enablers for growth and continuity

- Strong entrepreneurial drive and innovation by founders
- Technical and design support from multidisciplinary teams
- Institutional support including land provision and export facilitation
- Growing market demand for sustainable and biodegradable products

Lessons learnt

Maheero reflects that agricultural waste can be turned into value through innovation while creating environmental, social, and economic benefits. Using local resources and community-based work helps generate income and support livelihoods, while passion and market access are important for building sustainable and scalable circular businesses.

ModernPack Pvt LTD

Plastic waste → Value-added consumer products

Stage: **Waste Management**
Founded: **1994**
Location: **Colombo District**

CIRCULAR APPROACH:
RESOURCE RECOVERY

FINANCED BY:
INTERNAL FUNDS

COST SAVINGS:
26%

ENVIRONMENTAL BENEFIT:
~2.6 BILLION KILOJOULES

SCALE:
RECYCLED 10 MN YOGHURT CUPS

Description of business activity

Modern Pack Lanka collects discarded yoghurt cup plastics from municipal councils and processes them into reusable raw material through cleaning, shredding, and remelting. The recovered material is then transformed into durable consumer products such as plastic hangers ("Yanger"). This approach converts low-value plastic waste into high-value products while reducing environmental pollution and dependence on virgin plastics.

Investment and operational highlights

Metric	Traditional model	Circular model
Material sourcing	Virgin plastic	Recycled plastic waste
Waste	Disposed	Recovered and reused
Market segment	B2B industrial packaging supply	Diversified B2B and B2C goods
Energy use	High energy required for manufacturing	Localised recovery of materials
Customer value proposition	Functional products	Sustainable, value-added products

Financial impact

Cost savings of up to 26% achieved through the use of recycled materials compared to virgin plastic inputs

Value addition created by transforming low-value waste into premium consumer products

New revenue streams generated through entry into B2C markets through "Yanger" hangers

Higher environmental value delivered through large-scale plastic waste reduction (~32 tonnes of yoghurt cups)

Environmental impact

- Recycling of ~10 million plastic yoghurt cups (around 250,000 per week) into durable products like hangers
- Saving ~2.6 billion kilojoules of energy and 96 metric tonnes of CO_2 for every 1 Mn hangers produced using recycled inputs instead of virgin plastics

Social impact

- Direct employment of over 5 women
- Additional income for informal waste pickers
- Strengthens community-based waste collection networks

Key enablers for growth and continuity

- Strong innovation culture and sustainability commitment
- Partnerships with municipal councils and waste collectors
- Growing demand for sustainable consumer products

Lessons learnt

Modern Pack Lanka highlights that scaling impactful circular solutions is heavily dependent on the reliability of the reverse logistics network. Transforming high-volume plastic yoghurt cup waste into a profitable revenue stream requires building strong community collection pipelines and merging environmental value with functional, high-demand consumer goods.

Puraweduma Ceylon BSFL Pvt LTD

Organic waste → Sustainable animal feed and fertiliser

Stage: **Waste Management**
Founded: **2019**
Location: **Multiple districts**

CIRCULAR APPROACH:
RESOURCE RECOVERY, WASTE-TO-VALUE SYSTEMS, CIRCULAR AGRICULTURE

FINANCED BY:
INTERNAL FUNDS + UNDP GRANT + NGO

INVESTMENT:
LKR 5–6 MN (FOR 1.5 TONNES OF ORGANIC WASTE PER DAY)

PROFITABILITY:
LKR 800,000 MONTHLY

PAYBACK PERIOD:
1–2 YEARS

Description of business activity

Ceylon BSFL utilises Black Soldier Fly Larvae (BSFL) farming to convert organic waste into high-protein animal feed and organic fertiliser. Food waste, fruit waste, vegetable residues, and other biodegradable materials are used as feeding substrates for BSFL, which rapidly decompose the waste and convert it into nutrient-rich biomass. The harvested larvae are processed as feed for poultry, fish, ducks, quails, etc., and livestock, while the remaining frass is reused as organic fertiliser for agriculture and home gardening. In addition to production activities, the initiative promotes circular agriculture through consultancy services, training programmes, university awareness sessions, and support for small-scale farm establishment.

Investment and operational highlights

Metric	Traditional model	Circular model
Organic waste	Disposed or landfilled	Converted into feed and fertiliser
Animal feed source	Imported and expensive protein feed	Locally produced BSFL protein
Resource use	Linear waste disposal	Closed-loop waste-to-value system
Revenue streams	Single agricultural output	Feed production, fertiliser, consultancy, training
Customer value proposition	Conventional waste management	Sustainable waste recovery

Financial impact

Cost advantages were achieved by replacing conventional animal feed with locally produced BSFL protein sources

Income was generated through live larvae sales (LKR 120–150/kg), dried larvae sales (LKR 350/kg), compost sales (LKR 60/kg), consultancy, training programmes, BSFL egg sales, and farm activities

Revenue generation of over LKR 1 million monthly with estimated profit of LKR 800,000

Operational scalability was strengthened through consultancy services, awareness programmes, and support for establishing small-scale BSFL farms

Financial feasibility with an estimated investment payback period of 1-2 years

Environmental impact

- Reduction of organic waste accumulation through rapid decomposition by BSFL
- Lowered GHG emissions by 50-80% compared to conventional dumping and decomposition
- Production of organic fertiliser (frass) (250kg per tonne of waste) supporting soil enrichment and sustainable agriculture
- Reduced dependence on environmentally intensive conventional animal feed production

Social impact

- Strengthened community participation (3,500 families, 800+ students, 5+ municipalities) through training, small-scale farm development and learning opportunities
- Enhanced food security through support for sustainable poultry, fish, and livestock production

Key enablers for growth and continuity

- Partnerships with universities, agricultural experts, municipal councils, and sustainability-focused organisations
- Practical awareness programmes and laboratory sessions for students and farmers
- Technical consultancy and community-level training support
- Expansion potential through decentralised small-scale BSFL farming systems

Lessons learnt

The initiative highlights that low-cost circular farming systems can convert organic waste into valuable agricultural inputs while improving environmental sustainability, rural livelihoods, and resource efficiency through technical support and stakeholder collaboration.

Randeepa Plastic Pyrolysis

Non-recyclable plastic waste → Pyrolysis fuel and carbon products

Stage: **Waste Management**
Initiated: **2024**
Location: **Polonnaruwa District**

CIRCULAR APPROACH:
RESOURCE RECOVERY, WASTE-TO-ENERGY SYSTEMS

FINANCED BY:
INTERNAL FUNDS

PAYBACK PERIOD:
2 YEARS

COST ADVANTAGE:
CONVERSION OF LOW VALUE WASTE INTO INDUSTRIAL FUEL AND REUSABLE MATERIALS

RESOURCE RECOVERY:
18.5 TONNES OF WASTE

Description of business activity

Randeepa Plastic Pyrolysis operates an advanced waste to value system converting non-recyclable plastic and rubber waste into furnace oil, carbon black, and syn-gas through oxygen-free thermal decomposition. The company adapted and modified Chinese pyrolysis technology to suit Sri Lankan operating conditions, enabling recovery of waste streams often neglected by conventional recycling systems. Recovered outputs are reintegrated into industrial applications including tyre manufacturing and fuel generation, creating a closed-loop industrial resource recovery model.

Investment and operational highlights

Metric	Traditional model	Circular model
Plastic waste	Dumped, landfilled, or burned	Converted into industrial outputs
Resource use	Linear disposal system	Closed-loop waste recovery
Industrial fuel source	Imported fossil fuels	Locally recovered furnace oil
Waste recovery	Limited recyclable categories	Non-recyclable plastics and rubber processed
Revenue streams	Waste disposal activities	Furnace oil, carbon black, and syn-gas production

Financial impact

Cost advantage achieved through conversion of low value plastic and rubber waste into commercially valuable industrial products

Operational efficiency demonstrated through high material recovery yields: pyrolysis oil (70-80%), carbon black (10-15%), and syn-gas (5-10%)

Rapid financial return supported through estimated payback periods of ~2 years

Industrial scalability enabled through compact facility requirements (~1,000 sq. ft. for 500 kg processing capacity)

Resource recovery strengthened through processing of more than 18.5 tonnes of waste into reusable industrial materials

Environmental impact

- Diversion of non-recyclable plastic and tyre waste from landfills and open burning
- Reduction in soil, water, and air pollution associated with unmanaged waste disposal
- Processing of over 18.5 tonnes of waste into reusable industrial outputs
- Reduced fossil fuel dependency through production of furnace oil

Social impact

- Creation of employment opportunities across waste collection, processing, and technical operations
- Improved public health through reduction of harmful emissions from open waste burning
- Potential expansion of community-based waste collection systems through partnerships

Key enablers for growth and continuity

- Entrepreneurial innovation and strong sustainability commitment
- Self-financing and institutional land support from the Industrial Ministry
- Adaptation of international technology to local operational conditions
- Future partnerships with municipal councils, recyclers, schools, and community networks
- Growing demand for alternative industrial fuel and recovered materials

Lessons learnt

Plastic pyrolysis demonstrates that environmental waste challenges can be transformed into profitable industrial opportunities through technological innovation and circular resource recovery. Successful scaling depends on technology adaptation, efficient collection systems, strong institutional partnerships, and operational optimisation, enabling Circular Economy Models to provide scalable and economically viable sustainability solutions.

Robin Hood Army Sri Lanka

Surplus food → Donation and waste minimisation

Stage: **Waste Management**
Founded: **2018**
Location: **Colombo District**

CIRCULAR APPROACH:
FOOD REDISTRIBUTION, RESOURCE RECOVERY

FINANCED BY:
VOLUNTEER DRIVEN MODEL

COST SAVINGS:
ELIMINATES FOOD DISPOSAL COSTS FOR HOSPITALITY DONORS

OPERATIONAL EFFICIENCY:
RAPID REDISTRIBUTION OF SURPLUS FOOD THROUGH VOLUNTEER NETWORKS

SCALE:
COMMUNITY BASED OPERATIONS WITH RESTAURANT PARTNERSHIPS AND VOLUNTEERS

Description of business activity

Robin Hood Army Sri Lanka collects surplus food from restaurants and redistributes it to underserved communities within a short time frame in urban areas. This approach recovers edible food that would otherwise be wasted and redirects it to address food insecurity. Operating through a volunteer driven and zero funded model, the organisation leverages community participation and partnerships with food providers. The model ensures efficient utilisation of surplus resources while reducing environmental and social costs associated with food waste.

Investment and operational highlights

Metric	Traditional model	Circular model
Food surplus	Disposed as waste	Recovered and redistributed
Resource utilisation	Inefficient	Optimised through redistribution
Cost structure	Disposal costs incurred	Zero-cost, volunteer driven model
Value creation	Lost value	Social value (hunger reduction)
Stakeholder engagement	Limited	Strong collaboration with donors and volunteers

Financial impact

Cost savings achieved through elimination of food disposal costs for restaurants and food providers

Value recovery enabled by redirecting surplus food to underserved communities instead of landfill

Operational efficiency driven by a volunteer-based model enabling rapid and low cost redistribution

Social value creation achieved through improved food access and contribution to hunger reduction

Environmental impact

- Reduction in food waste through recovery and redistribution of surplus food
- Lower GHG emissions associated with food and landfill waste

Social impact

- Redistribution of surplus food to underserved and vulnerable communities
- Strengthening of community engagement through volunteer participation

Key enablers for growth and continuity

- Strong social mission and community-driven approach
- Consistent operational execution and transparency with donors
- Partnerships with restaurants and food providers
- Use of social media platforms to coordinate and expand outreach
- Volunteer engagement as a core operational driver

Lessons learnt

The success of Robin Hood Army demonstrates that circularity does not always require high tech investment. Instead, it requires the creative reorganisation of existing resources (volunteer time, personal vehicles and surplus commercial food). To scale this impact, the focus must remain on expanding donor networks and volunteer engagement.



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Pathways for scaling and replication

CHAPTER 03

The 32 case studies provided in this Handbook represent Circular Economy practices that can create viable business opportunities and generate financial and operational benefits within the Sri Lankan food sector. Regardless of the size of the business, its operations and its appetite for circular investments, these Circular Economy Models can be embedded within the operations of any business to strengthen long term business resilience.

Some key lessons emerging across the business cases are:



Strategic collaborations

Circular food business models require strong collaboration among multiple stakeholders, including circular input suppliers, like-minded customers, modern marketplaces, communities, and institutional actors. Such partnerships are essential for building profitable, resilient, and sustainable circular ecosystems.



Innovation driven transformations

An innovative mindset is critical for advancing circular food models. Continuous research and development enable businesses to redesign traditional linear practices into more sustainable and circular approaches. These innovations may not be profitable at first, but with the right strategies, they can solve problems caused by traditional linear systems.



Long term value creation

Successful circular businesses prioritise long term sustainability, resource efficiency, and stakeholder value creation rather than focusing solely on immediate financial returns. Hence, in evaluating the feasibility of these Circular Business Models, it is essential to focus on the long-term value creation.



Human centred circularity

Circular transitions become more effective when businesses place people at the centre of decision-making. Empowering women, supporting livelihoods of rural communities, and ensuring inclusive participation contribute significantly to the sustainability of circular initiatives.



Continuous measurement and Improvement

Continuous monitoring, learning, and improvement are essential for circular business success. Measuring environmental, social, and economic outcomes enables businesses to identify gaps, adapt strategies, enhance circular performance over time, and effectively communicate value to stakeholders.

Effective replication of these Circular Economy Models in different business contexts requires careful planning, implementation and continuous improvement. The Plan Do Check Act (PDCA) framework (Figure 5) provides a practical way for businesses to replicate the Circular Economy Business Models.

Figure 5: Replicating Circular Economy Models using PDCA cycle

Map waste flows

Understand where waste is generated, how much is available, its composition and whether it varies seasonally. For example, a fruit processor may find that rejected fruit, peels and seeds have different quantities and characteristics, making them suitable for different uses.

Design to prevent waste

Circularity should begin with the design of products and processes. Reducing material use, preventing contamination and keeping biological materials separate can increase value of by-products and increase viability of downstream usage.

Secure both demand and supply

Establishing contracts early to secure reliable supply of materials and markets for outputs can reduce the risk of investing without sufficient supply or demand. For example, a business producing insect protein will need agreements with food processors for organic feedstock and with feed manufacturers for the resulting protein meal.

Start with proven circular models

Starting with relatively simple waste streams and commercially viable circular economy models allows businesses to test the model using existing resources.

Phase investments to reduce risk

Circular activities can be introduced alongside existing operations and expanded once they demonstrate value.This allows the business to learn without putting its core operations at risk.

Implement shared infrastructure for scale

Smaller businesses may not generate enough material to justify investing in specialised equipment. Shared facilities can allow several businesses in the same area to pool their materials and investment for drying, grinding, composting, recycling facilities, making equipment more affordable and better utilised.



Measure complete value of operations

Measure financial, circular, environmental, and social outcomes together. Tracking these metrics captures the complete value of your operations.

Scale successful pilots into repeatable models

Replication becomes easier when businesses document operating procedures, material specifications and quality standards. This is particularly important for companies operating across several sites or working with multiple suppliers, where consistency leads to commercial viability.

Make circularity part of business activity

Circularity is more likely to sustain when it becomes part of everyday management. Procurement policies, staff incentives, operational targets and investment decisions can all enable identifying, testing and scaling new opportunities over time.

Conduct pilot tests under real conditions

A technology that works in a demonstration may perform differently in a working food business. Moisture, contamination, storage and labour requirements can all affect results. Small pilots allow businesses to identify these issues before committing significant capital.

Measure financial feasibility and value created

Circular investments should be assessed against both new revenues and costs that can be avoided to establish the business case. A business producing biochar, for example, may benefit from improving soil quality, reducing fertiliser and energy costs as well as lowering waste disposal costs.

Establish proof of concept

A successful pilot can provide evidence of production volumes, product quality and financial returns. This can strengthen the case, particularly where financiers are unfamiliar with the technology or secondary product market.

Embedding circularity mindsets within organisations

Sustainable transitions succeed only when circularity shifts from a project level initiative to an organisation wide mindset. Lessons from the business cases on this Handbook highlight continuous training and skill development as the core drivers of this shift. When circular logic is woven into daily decisions and core strategy, employees start looking for opportunities and solutions for circularity by themselves. (Table 2).

Table 2: Capacity building approaches for circularity across organisational scales

Capacity building approach	What businesses can do	How it builds a circular mindset
Start with business problems	Use real issues such as material losses, food waste, packaging costs and disposal costs as examples during training.	Employees begin to see waste as lost value and an opportunity for improvement.
Give each function a circular lens	Help procurement, operations, logistics, sales, finance and other teams identify how circularity applies to their decisions.	Circular thinking becomes part of everyday business decisions rather than the responsibility of one sustainability team.
Learn by solving real problems	Run short challenges where teams identify and address one source of waste or resource inefficiency.	Employees develop practical problem solving skills and learn by doing.
Create circular champions	Identify employees across departments who can share knowledge, identify opportunities and support colleagues.	Peer learning helps embed circular practices across the organisation.
Use community learning	Smaller businesses can learn through hands on demonstrations and peer exchange with farmers, neighbouring businesses and local networks.	Businesses can build practical knowledge while gaining confidence from real examples.
Link learning to performance	Include simple indicators such as waste reduction, material recovery and resource savings in team targets.	Employees see that circularity is valued as part of business performance.
Build capacity continuously	Use existing online resources to design short internal sessions. Partner with universities, industry associations and development partners for continuous learning.	Circular Economy becomes an ongoing area of learning rather than a one off training activity.
Make circularity part of organisational culture	Encourage managers and employees to raise circular opportunities during routine planning, procurement and operational discussions.	Employees begin identifying circular solutions themselves rather than waiting for specific projects or instructions.



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Assessing and financing Circular Economy projects

CHAPTER 04

Attracting financing for Circular Economy projects

Financiers evaluate Circular Economy projects using financial, operational, and risk assessment criteria similar to those applied to conventional business models. While the specific criteria vary by type of finance, they generally want to understand:

- Can the business generate stable cash flows?
- Is there proven market demand?
- Does circularity improve profitability or reduce risk?
- Is the management team capable and experienced?
- Can the business withstand external shocks?
- Are governance systems strong enough to protect investor confidence?

The businesses that succeed in attracting financing are the ones that can clearly demonstrate: “Circularity is not just our environmental mission. It is our competitive business advantage.” This chapter explains how financiers assess, and how businesses in the circular food sector can strengthen their financial story.

Businesses need to demonstrate a combination of technical, financial, operational, and governance strengths to attract investments. This is because financiers are not only assessing the idea, they are also assessing the people, systems, discipline, and accountability behind the business. The strongest Circular Economy projects are those where sustainability directly improves business and financial performance. Based on discussions with financiers, key performance indicators that financiers look for are summarised in Figure 6.

Figure 6: Key performance indicators for attracting investments



> “Businesses need to demonstrate a combination of technical, financial, operational, and governance strengths to attract investments.

1. **Technical competence and operational capability**
   Financiers look for businesses that combine technical expertise with the operational capability required to deliver consistent results. In the food sector, this means navigating seasonal supply fluctuations, maintaining strict quality control, and efficiently managing fragmented smallholder farmer networks. This capability gains credibility when supported by evidence such as stable production volumes, consistent quality, successful pilot replication and yield improvements across multiple production cycles. Collaborations with universities, research institutes and technical consultants can further strengthen financier confidence.

2. Financial sustainability

Financial sustainability is assessed through three linked dimensions: sustainable revenue growth and diversification, improving profitability, and reliable cash flow generation. Financiers expect sales growth to extend beyond core product expansion. Growth is stronger when supported by contracts or repeat purchase behaviour, rather than spot sales.

Profitability must show that circularity improves margins, not just activity levels. This includes measurable reductions in input costs combined with additional gross margin from secondary products. For established businesses, the key test is whether earnings before interest, tax, depreciation and amortisation (EBITDA) improves consistently across multiple production cycles, rather than only during pilots. For earlier stage businesses, financiers may instead look for credible evidence that the model can achieve positive unit economics and scale profitably.

Cash flow stability is assessed through predictability. Where circular models diversify buyers, revenue streams or product outlets, they can reduce dependence on individual customers or commodity cycles and strengthen cash-flow resilience. Long-term offtake agreements, recurring contracts, and multiple product outlets strengthen repayment confidence.

3. Commercial viability, competitive advantage and resilience

Commercial viability and competitive advantage influence how financiers assess the value and risk of a business. Equity investors may assess value using approaches such as discounted cash flow (DCF) models, where future cash flows are discounted using the Weighted Average Cost of Capital (WACC). WACC represents the return investors require for taking risk. Higher perceived risk generally results in a higher WACC and a lower valuation. Higher risk results in a higher WACC and a lower valuation. Where Circular Business Models demonstrably reduce input dependency, resource exposure or revenue concentration, they can reduce certain dimensions of perceived risk, which may positively influence financing terms and valuation. For example, a circular business with diversified revenue streams, long term contracts and lower input dependency may demonstrate reduced exposure to supply and market risks, which can positively influence its risk profile, financing terms and enterprise value.

Competitive advantage is also assessed through defensibility. Strong circular businesses build structural advantages that protect margins and support stronger valuation over time such as:

- Integrated farmer networks and stable supply
- Waste to value systems that reduce input costs
- Subscription or returnable packaging models that improve customer retention
- Technical capability in processing by-products into higher value goods

4. Governance

Governance is often the deciding factor between investment interest and financial commitment. It determines whether a business can be trusted to manage capital, risk, and operations consistently.

Financial and organisational governance is the foundation. Financiers expect proper bookkeeping, regular management accounts, separation of personal and business finances, audited statements, tax compliance, and transparent cash flow reporting. Operational governance ensures systems discipline.Clear roles across finance, operations, procurement, and sales reduce dependency on individuals and improve accountability. This includes documented procurement procedures, pricing policies, quality control systems, inventory tracking, and traceability.

Circular businesses require stronger governance due to system complexity. Waste-to-value operations, returnable packaging systems, and multiple revenue streams increase the risk of leakage and inefficiency without structured oversight.

External governance strengthens credibility. Engagement with auditors, banks, certification bodies, and technical partners improves transparency. Strong governance reduces perceived risk. It increases investor confidence in the business ability to scale, service debt, and operate transparently under stress conditions.

Financial statements comparison: Traditional linear vs Circular food business

One of the most effective ways to demonstrate the financial value of circularity is to translate circular business benefits into conventional financial metrics. The comparison below illustrates how circularity can affect revenue, operating costs, profitability and cash flows relative to a conventional linear food business model. The figures are simulated and indicative, drawing on circular business examples and agro-processing benchmarks (Tables 3–5).

Table 3: Income statement

Line item	Traditional linear (LKR Mn)	Circular (LKR Mn)	Notes and assumptions
TOTAL REVENUE	**1,000**	**1,310**	**Revenue uplift of 31% is driven by diversification, not price inflation. This is consistent with early-stage circular transition models in food sectors**
Core product sales	1,000	1,080	Circular model assumes ~8% yield improvement due to reduced processing losses, improved extraction efficiency, and reduced spoilage. This is within realistic agro-processing benchmarks (5–12%)
Premium circular product lines	0	120	New stock-keeping units created from certified sustainable inputs (organic, low-waste, traceable products). Price premium assumed at 10–20% with moderate market penetration (not full adoption)
By-product revenue	0	85	Monetisation of waste streams (peels, pulp, shells). Conservative assumption: only 60–70% of waste is commercially recoverable due to market absorption limits
Circular service revenue	0	25	Includes waste recovery services, return logistics handling, and small-scale processing services for partner SMEs. Early-stage service revenue is typically low but scalable
COST OF GOODS SOLD (COGS)	**(945)**	**(861)**	**Circular model reduces structural input dependency but increases system complexity costs. Net improvement is efficiency driven, not cost elimination**
Raw materials	(420)	(365)	Reduction due to improved yield and partial circular reintegration of inputs. Assumes 10–13% input efficiency gain (realistic in agri-processing waste recovery loops)
Packaging	(80)	(92)	Higher costs due to biodegradable food grade packaging replacing conventional plastics. Costs are partially offset through reusable packaging, refill systems, and packaging reduction practices
Energy	(110)	(88)	Reduction from partial renewable adoption (solar/biomass) and process optimisation. Full decarbonisation not assumed at this stage
Water	(45)	(32)	Savings from water recycling and rainwater harvesting systems and closed-loop processing systems. Assumes 25–35% reduction is feasible in agro-industrial setups
Labour	(140)	(150)	Increase due to sorting, segregation, reverse logistics, and circular operations. Labour intensity increases in early circular transitions

Logistics	(90)	(78)	Gains from integration of route optimisation, aggregation centres, and reverse logistics
Waste disposal	(25)	(8)	Reduction due to diversion of waste into feed, compost, or secondary processing. Residual waste still exists due to contamination and regulatory limits
Maintenance	(35)	(48)	Increase due to reuse-based systems requiring repair, refurbishment, and extended asset lifecycle management
GROSS PROFIT	**55**	**449**	**Margin improvement driven by both revenue diversification and input efficiency gains. Still within realistic industrial ranges**
Gross Margin	**5.5%**	**34.3%**	
OPERATING EXPENSES (OPEX)	**(75)**	**(115)**	**Circular models require higher institutional maturity and governance investment**
Administration	(25)	(30)	Slight increase due to governance systems, reporting requirements, and compliance with circular certification
Sales and marketing	(35)	(45)	Increase due to new products requiring market education; partially offset by brand loyalty gains
R&D and innovation	(10)	(25)	Circular systems require ongoing innovation in product development and process engineering
Governance and compliance	(5)	(15)	Stronger reporting, ESG compliance, traceability systems, and investor requirements
Earnings before interest, taxes, depreciation, and amortization (EBITDA)	**(20)**	**334**	**Linear model shows weak operating profitability; circular model shows strong operational leverage**
EBITDA Margin	**-2%**	**25.5%**	**Reflects structural shift in business model efficiency**
Finance costs	(20)	(38)	Circular model assumes higher initial debt due to infrastructure (processing systems, renewable energy, logistics redesign.
Depreciation	(15)	(42)	Higher asset base due to circular infrastructure investments and sharing economy (waste recovery systems, energy systems, sorting infrastructure)
PROFIT BEFORE TAX (PBT)	**(55)**	**254**	**Linear model is near break-even; circular model demonstrates strong operational viability**
Tax (20%)	0	(51)	Linear model assumes minimal taxable profit; circular model assumes tax compliance on positive earnings
NET PROFIT AFTER TAX	**(55)**	**203**	**Circular model transforms business from marginal profitability to strong positive earnings base**
Net Profit Margin	**-5.5%**	**15.5%**	**Margin improvement driven by efficiency + diversification + risk reduction**

Table 4: Cash flow statement

Cash flow item	Traditional linear (LKR Mn)	Circular (LKR Mn)	Notes and assumptions
CASH FLOW FROM OPERATING ACTIVITIES	**(60)**	**210**	**Strong operational cash generation is a key investor signal**
Net profit after tax	(55)	203	Circular model generates positive earnings
Add: Depreciation	15	42	Higher infrastructure asset base
Working capital adjustments	(20)	(35)	Higher receivables and operational scale
CASH FLOW FROM INVESTING ACTIVITIES	**(30)**	**(205)**	**Circular transition requires larger upfront investment**
Capital expenditure (CapEx)	(25)	(180)	Investment in circular infrastructure and renewable systems
Technology and R&D investment	(5)	(25)	Traceability systems, process innovation, product development
CASH FLOW FROM FINANCING ACTIVITIES	**35**	**217**	**Circular businesses rely more heavily on structured finance in early years**
New debt financing	70	220	Larger financing requirement due to infrastructure scale
Equity injection / grants	10	75	Blended finance and investor participation
Debt repayments	(25)	(40)	Higher repayment obligations
Interest payments	(20)	(38)	Increased financing costs linked to expansion
NET INCREASE / (DECREASE) IN CASH	**(55)**	**222**	**Circular model demonstrates stronger long-term liquidity generation**
Opening cash balance	80	95	
CLOSING CASH BALANCE	**25**	**317**	**Strong cash position improves resilience and debt servicing capacity**

Table 5: Statement of financial position

Balance sheet item	Traditional linear (LKR Mn)	Circular (LKR Mn)	Notes and assumptions
ASSETS	**630**	**1,035**	**Larger asset base reflects operational capability and circular infrastructure**
Cash and cash equivalents	25	110	Higher cash reserves due to improved profitability and stronger operating cash flows
Accounts receivable	120	145	Slightly higher due to increased sales volumes and contracted buyers
Inventory	180	160	Improved inventory efficiency and reduced waste losses
Prepaid expenses	10	15	Higher due to certifications, ESG compliance, and insurance coverage
Total Current Assets	**335**	**430**	**Circular model shows stronger liquidity position**
Property, plant and equipment (PPE)	280	520	Higher investment in waste recovery systems, renewable energy, water recycling, cold storage, and reusable packaging systems
Intangible assets	15	40	Includes certifications, technology systems, traceability platforms etc
Shared systems	0	45	Shared logistics, leasing systems, or packaging recovery infrastructure
Total Non-Current Assets	**295**	**605**	**Circular models typically require higher upfront infrastructure investment**
LIABILITIES	**450**	**690**	**Higher leverage offset by stronger earnings profile**
Accounts payable	110	125	Increased procurement scale and supplier partnerships
Short-term borrowings	90	105	Working capital financing for expanded operations
Current portion of long-term debt	30	45	Higher repayments linked to infrastructure investments
Total Current Liabilities	**230**	**275**	**Circular models initially carry higher short-term obligations**
Long-term debt	220	360	Financing for renewable energy, processing equipment, waste recovery, and circular systems
Deferred grants/ blended finance	0	55	Potential concessional or climate-linked financing support
Total Non-Current Liabilities	**220**	**415**	**Circular businesses access commercial and blended finance**
EQUITY	**180**	**345**	**Improved equity base strengthens long-term solvency**
Share capital	100	150	Additional investor participation or retained investment
Retained earnings	80	195	Driven by stronger profitability and cash retention
TOTAL LIABILITIES AND EQUITY	**630**	**1,035**	

Role of Financial Institutions in financing Circular Economy

Financial institutions have an important role to play in assisting food sector businesses to identify, finance and scale Circular Economy opportunities. However, a diagnostic conducted by the CIRCULAR project on the financing ecosystem for Circular Economy identified several challenges to scaling circular finance in Sri Lanka[7]. This includes difficulties in identifying and evaluating Circular Business Models, understanding and pricing risks associated with linear value chains, integrating circularity into credit appraisal and risk modelling, designing financial products for the active development of Circular Economy beyond pilot initiatives, and measuring, reporting, and managing Circular Economy and climate impacts. The diagnostic also highlighted data gaps, limited standardised metrics for measuring circular impacts, and difficulties faced by smaller enterprises in meeting the documentation and environmental compliance requirements of some financiers.

This Handbook supports financial institutions to:

Initiate conversations on circularity with clients

Financial institutions can use the examples in this Handbook as a practical reference when advising agri and food sector clients. Relationship managers and credit officers can use examples on these real business case examples to initiate conversations to help clients identify comparable opportunities within their own operations and value chains, while recognising that each model needs to be adapted to the business context.

Ask the right questions before financing

Rather than treating circularity as a separate activity, financial institutions can help clients assess the underlying business opportunity. Useful questions that can be asked include: Where are resources currently being lost? Can waste be prevented, reused or converted into a productive input? Which costs could be reduced? Are there potential new revenue streams? What investment is required, and what are the expected payback period, cash-flow effects and risks? This can help businesses move from a broad circular ambition towards a clearly defined and financeable investment proposal.

Assess both circular opportunities and linear risks

Circularity can also provide a useful lens for understanding existing portfolio risks. Financial institutions can consider clients' exposure to resource dependency, input-price volatility, waste, climate vulnerability, supply disruptions and changing regulatory requirements. The objective is not to replace conventional credit assessment, but to complement it with information that may affect future cash flows, operating costs and repayment capacity.

Strengthen financial and impact evidence

Banks can encourage clients to improve the quality of data supporting circular investments, including baseline waste and resource use, cost savings, additional revenues, material flows, market demand and relevant environmental outcomes. Better evidence can make circular opportunities easier to assess and can also support credible impact reporting.

Beyond this Handbook the CIRCULAR project is building practical circular finance capability within Sri Lankan Financial Institutions. A Masterclass in Circular Economy Finance for Financial Institutions is currently being designed to move beyond general awareness towards practical application. The e-training will focus on five priority areas: understanding the financial risks of linearity; identifying circular opportunities in the food sector; assessing portfolio exposure to linear business models; strengthening credit assessment and financial modelling; and designing financial products, developing investment pipelines and measuring impact. The training will use practical cases, financial modelling, due diligence tools, scoring templates and simulation exercises, with the Handbook providing Sri Lankan business examples for application. The link to the e-trainings will be available on the CIRCULAR project page once ready (https://www.expertisefrance.fr/en/projects/circular-project-sri-lanka).

The aim is to enable financial institutions to identify circular opportunities with their clients, assess them using familiar financial principles and connect viable investments with appropriate financing solutions. Where appropriate, this may include green or sustainability-linked lending, working capital finance, guarantees, transition finance, blended finance or other instruments suited to the investment need.



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