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INTEGRATING SUSTAINABLE CONSUMPTION AND PRODUCTION (SCP) AND CLIMATE CHANGE POLICY

A Strategic Contribution to Strengthening Sri Lanka's Nationally Determined Contributions (NDC 3.0)

White Paper

Acknowledgements

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Abbreviations

BAU	Business As Usual
BOI	Board of Investments of Sri Lanka
CE	Circular Economy
CEB	Ceylon Electricity Board
EFF	Extended Fund Facility
EPL	Environmental Protection License
EPR	Extended Producer Responsibility
EU	European Union
EUD	European Union Delegation
GBG	Green Building Guidelines
GHG	Green House Gases
GST	Global Stocktake
HDI	Human Development Index
IP	Industrial Park
IPPU	Industrial Processes and Product Use
IRP	International Resources Panel
ISO	International Organization for Standardization
KPI	Key Performance Indicator
LCF	Life Cycle Assessment
LT-LEDS	Long-Term Low Greenhouse Gas Emission Development Strategies
LULUCF	Land Use, Land Use Change, and Forestry
MRV	Measurement, Reporting and Verification
MSW	Municipal Solid Waste
NDC	Nationally Determined Contribution
NWSDB	National Water Supply and Drainage Board
PET	Polyethylene Terephthalate
PPP	Producer Pays Principle
PSC	Policy Support Component
RCP	Representative Concentration Pathways
RECP	Resource Efficiency and Cleaner Production
SCP	Sustainable Consumption and Production
SDG	Sustainable Development Goals
SLCB	Sri Lanka Convention Bureau
SLITHM	Sri Lanka Institute of Tourism & Hotel Management
SLTDA	Sri Lanka Tourism Development Authority
SLTPB	Sri Lanka Tourism Promotion Bureau

SMEs	Small and Medium-sized Enterprises
TA	Technical Advisory
VNR	Voluntary National Review
UNFCCC	United Nations Framework Convention on Climate Change

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Executive Summary

Sustainable Consumption and Production (SCP) lies at the centre of effective climate action, offering systemic solutions to reduce greenhouse gas emissions by addressing how resources are extracted, used, and managed across the economy. The link between climate change and SCP is critical but often overlooked. Unsustainable patterns of production and consumption are among the root causes of greenhouse gas emissions, environmental degradation, and resource depletion.

Sri Lanka prepares to submit its enhanced NDC 3.0 in 2025 under the Paris Agreement, there is a unique opportunity to integrate Sustainable Consumption and Production (SCP) principles more systematically into its climate commitments. This white paper, developed under the EU SWITCH-Asia Policy Support Component (PSC), provides an assessment of Sri Lanka's current SCP-NDC linkages and outlines practical pathways to strengthen this integration. Sri Lanka has already made important strides in mainstreaming SCP through its National SCP Policy (2019) and sectoral actions in its Updated NDC (2021). SCP elements such as energy and water efficiency, circular economy, waste reduction, and green public procurement are embedded in national policies. Yet, implementation remains challenging, and major gaps persist in data availability, technology access, institutional coordination, and private sector engagement.

For Sri Lanka, the nexus between climate change and SCP is particularly important, as the country faces rising emissions linked to fossil fuel dependency, rapid urbanisation, and resource-intensive industries such as textiles, construction, and tourism. At the same time, Sri Lanka is not a major global emitter and remains highly vulnerable to climate impacts. By integrating SCP principles—such as resource efficiency, circular economy practices, and waste reduction—into its climate strategies, Sri Lanka can address emissions at their source while strengthening its economic resilience. The country's SCP policy and updated NDC already reflect elements of this approach, but there is significant room to scale up these efforts. Embedding SCP into NDC 3.0 offers a timely and strategic opportunity for Sri Lanka to align its development priorities with climate goals and to move toward a more sustainable, low-carbon future.

Priority Recommendations: The Way Forward

1. **Identify and prioritise high-impact sectors.**

   The integration of SCP into climate actions should be driven by prioritised sectors with significant resource and emissions footprints. For Sri Lanka, **textiles, tourism, and construction** emerge as key sectors for SCP and Circular Economy (CE) integration due to their economic importance, export potential, and readiness.

2. **Develop a strong MRV mechanism.**

   A robust **Measurement, Reporting and Verification (MRV)** system—potentially building on existing structures like the Environmental Protection License—must be agreed upon across stakeholders, particularly the private sector, to track SCP-related actions and inform future policies.

3. **Build institutional and technical capacity.**

   Before the NDC enhancement process begins, all relevant actors—including government, private sector, academia and experts—require **capacity development on SCP principles and tools**. Strengthening the **Climate Change Secretariat** and the **Environment Planning & Economics Division** of the Ministry of Environment is essential for meaningful integration.

4. **Ensure targeted public awareness and stakeholder engagement.**

   Raising awareness about the co-benefits of SCP—for cost savings, competitiveness and environmental sustainability—is crucial. Dialogue should be built on a **comprehensive stakeholder mapping**, especially involving SMEs, local authorities, and community organisations.

5. **Use SCP to unlock green finance.**

   Better articulation of SCP interventions in NDCs can attract **climate-linked international finance**. This is particularly important for sectors like **waste management and textiles**, where EPR schemes, product certifications and greener supply chains are aligned with global trade regulations and funding criteria.

6. **Integrate SCP with Long-Term Low Emission Strategies (LT-LEDS).**
   SCP and CE principles should be seen as central to long-term climate and development strategies. While setting quantified targets during NDC 3.0 may be challenging, **interim milestones** can be established to lay the foundation for future sectoral goals.

Sector Highlights

- **Textiles:** A key export industry, especially to the EU, where carbon neutrality policies will impact Sri Lankan products. The sector needs external support for process certification, energy transition, and material efficiency.
- **Tourism:** Offers low-hanging fruit for SCP application, particularly via community-based tourism models, green building design, and SCP-linked certification.
- **Construction:** Green building standards for government buildings can drastically cut material use and emissions. Enforcing green codes and passive architecture is vital.
- **Food processing, waste, mining, and packaging** sectors also show promise for targeted SCP interventions.

SCP integration into Sri Lanka's next NDC is not only feasible—it is **necessary**. Doing so will strengthen Sri Lanka's climate ambition, enhance its competitiveness in international markets, and unlock new opportunities for sustainable growth. The recommendations in this report are not abstract technical proposals; they are **pragmatic, timely actions** that—if adopted—can drive meaningful change across sectors and society.

1. Introduction

1.1. SWITCH-Asia policy support component

Through the EU Green Deal and Global Gateway, the European Union (EU) programme is committed to supporting the transition of countries to a low-carbon, resource-efficient and circular economy while promoting sustainable production and consumption (SCP) patterns.

As part of this engagement, the SWITCH-Asia Policy Support Component (PSC) aims to enhance SCP progress through scaling up and mainstreaming SCP policy in 42 countries, extending from the Middle East, Central Asia, to South Asia, Southeast Asia and the Pacific (the "target region"). The SWITCH-Asia PSC builds on the SWITCH-Asia programme's long and successful track record of providing technical assistance. It also links with the SWITCH-Asia grants component and connects with EU Delegations' (EUDs) programmes and priorities. The programme's flexible and on-demand interventions, its mandate to foster cooperation, strengthen networking and build a platform for exchange makes the PSC well-positioned to meet the needs of the target region in addressing the triple planetary crises, namely climate change, biodiversity loss and pollution, and meeting international commitments, including the SDGs and the Paris Agreement.

The PSC's mode of operation is that it liaises with and advises national governments and regional organisations and networks in the target region. Typically, it engages countries in regional and multi-country approaches on scaling up SCP policy and implementation, delivering technical advisory, knowledge exchange and building capacities of regional institutions. Its key points of intervention are SDG 12 and SCP-related goals' progress and support, integrating SCP into Nationally Determined Contributions (NDCs) and climate-related actions, regional stakeholder engagement with particular attention to business and industry representatives, and communicating on SCP.

This report has been developed as a part of an exploratory Technical Advisory (TA) titled "Sustainable Consumption and Production (SCP)-linked Nationally Determined Contributions (NDC) – Lessons Learning from the Champion Countries and identifying opportunities to capitalise synergies between NDC & SCP". The TA was conducted in five South Asian countries, namely, Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka.

1.2. The nexus between Climate Change and Sustainable Consumption & Production

Unsustainable consumption and production patterns are the fundamental drivers of three interlinked planetary crises: climate change, biodiversity erosion and environmental pollution. Evidence demonstrates that strategic modifications to these patterns could substantially reduce global greenhouse gas emissions through both direct and indirect pathways. Deploying SCP frameworks yield significant co-benefits for climate change mitigation and adaptation in the transition to sustainable development, particularly concerning natural resource extraction and utilisation. The International Resources Panel's (IRP) Global Resources Outlook – 2024 presents compelling evidence of this relationship. Accordingly, the extraction and processing of material resources (fossil fuels, minerals, non-metallic minerals and biomass) for over 55 per cent of greenhouse gas emissions (GHG) and for 40 per cent of particulate-matter-related health impacts. If land-use change is considered, climate impacts grow to more than 60 per cent, with biomass contributing the most (28 per cent) followed by fossil fuels (18 per cent), and non-metallic minerals and metals (together 17 per cent). Biomass (agricultural crops and forestry) also accounts for over 90 per cent of the total land-use-related biodiversity loss and water stress.

These findings emphasise the substantial potential for both climate change mitigation and adaptation strategies through enhanced material resource efficiency and sustainable resource management practices. The data demonstrates clear pathways for intervention through improved production processes and consumption patterns. Despite its significance, the nexus between climate change and sustainable consumption and production remains substantially underexplored in global climate policy frameworks. However, the Paris Agreement and its associated Nationally Determined Contributions present a strategic

opportunity for nations to explore this critical relationship more comprehensively, integrate SCP strategies into climate plans and actions, and develop more holistic and systemic approaches to emissions reduction and climate change resilience building.

Considering the extreme dependence on natural resources by all economies and societies, the need for decoupling economic growth from increasing resource use and environmental impacts should be the main aim for moving away from wasteful linear production and consumption practices. In this context, the nexus between SCP and NDC provides the framework and could be the catalyst for transformative actions through engagement and compromise at all levels, by all concerned stakeholders, government entities, private sector and consumers. To that end, the juxtaposition of SDG 12 (Responsible Consumption and Production) against the impacts and correlation with climate and other SDGs (Sustainable Development Goals), particularly SDG13 (Climate Action) and SDG17 (Partnerships for the Goals), is an excellent opportunity for a more comprehensive understanding of the issues at stake between climate change and SCP, and to identify priority areas for actions and quick wins.

Since climate actions are as much dependant on production as on consumption, effective transformative actions to cope with climate changes in the context of the NDCs can only thrive if consumers are encouraged to understand why buying products that are sustainably produced is crucial for the environment and for the reduction of emissions harmful to the climate. Linkages between SDG 12, SDG 13 and SDG 17 provide an adequate framework to implement and encourage sustainable patterns of production and consumption in the NDCs without compromising market access and profitability in the production sector.

1.3. Nationally Determined Contribution

Nationally Determined Contribution is the building block of the Paris Agreement, which was agreed to at the 21st Conference of Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC). It paved the path towards a bottom-up approach towards a global agreement to solve the global climate change challenges and an opportunity to integrate national priorities with climate actions. All the parties are expected to update their NDC progressively every five years to achieve the overall objectives of the Paris Agreement. The NDC process has been recognised as an opportunity to address other global commitments in an integrated manner. The Sustainable Development Goals, which are a landmark agreement in the 2030 global development agenda, also have recognised the Paris Agreement as a main contributor to achieving the targets. Therefore, the Paris Agreement has opened a window of opportunity for member countries to set up a development pathway that contributes to multiple global and national commitments with a common process including monitoring, reporting and verification.

During the first NDC cycle of the Paris Agreement, many Asia-Pacific countries have included SCP-linked NDC targets and championed SCP-NDC integration. Altogether 28 countries in the Asia-Pacific region have a direct reference to SCP within their NDC targets but almost all the countries have SCP-related targets without a direct reference to it. Energy efficiency, waste management, value chain improvements, green buildings, building material with low carbon footprint, promoting sustainable lifestyles are some common SCP-linked NDC areas in Asia. However, many of these targets have been given as conditional so that the achievements are contingent on access to international support in the areas of finance, technology and capacity building.

In 2025, all parties to the Paris Agreement are required to submit their third round of Nationally Determined Contribution (NDC 3.0), which must show increased climate ambition guided by the Global Stocktake (GST) outcomes. This update presents countries with a strategic opportunity to integrate their national priorities, including sustainable consumption and production, into their enhanced climate commitments. The bottom-up approach of NDCs enables countries to effectively align their domestic objectives with their international climate ambitions, ensuring both national relevance and global climate action.

To capitalise on this opportunity, the Technical Advisory, “Sustainable Consumption and Production (SCP)-linked Nationally Determined Contributions (NDC)”, has been specifically designed and implemented to support target countries in enhancing their NDCs. The TA aims to add value by making the NDCs more relevant and pragmatic through appropriate mainstreaming of responsible consumption and production patterns, helping countries bridge the gap between ambitious climate goals and practical implementation strategies.

1.3.1. Objectives of the Technical Advisory

The TA has been strategically designed as an exploratory and scoping initiative to examine the integration of SCP into climate commitments of the countries. It has three primary objectives:

- To assess the current status of SCP integration within existing climate ambitions
- To identify the potential opportunities for enhanced integration
- To explore viable pathways for implementing the integration options.

This scoping approach allows for a comprehensive understanding of both existing practices and future possibilities, providing a foundation for more targeted interventions in supporting countries' climate actions.

1.3.2. Methodology of the Technical Advisory

The TA was conducted as a scoping initiative to explore the potential avenues to integrate SCP into the Nationally Determined Contribution of Sri Lanka The exploratory exercise collected the required information through three main processes,

- Studying the relevant policy documents of the country pertaining to SCP and climate change
- Consultations with key stakeholders
- National stakeholder validation workshop.

2. Sri Lanka country profile

2.1. Socio-economic status of Sri Lanka

Sri Lanka is an island country with a population of approximately 22 million. As of the Human Development Index 2021/22 report issued by the United Nations Development Programme (UNDP), Sri Lanka has a Human Development Index (HDI) score of 0.782, ranking 73rd among 191 countries. This places the country in the high development category according to the United Nations Development Programme (UNDP) classification, and as an upper-middle-income country by the World Bank classification of July 2019 (World Bank, 2019). Sri Lanka's quality of life indicators, including HDI, life expectancy and education levels, position it favourably compared to other South Asian countries. Despite these successes, Sri Lanka faces several social challenges. Income inequality remains a persistent issue, with a Gini coefficient of 39.3, indicating significant disparities between urban and rural populations (Department of Census and Statistics, 2022a). Youth unemployment, particularly among the educated youth, stands at approximately 26 per cent, posing a major social concern. The country also grapples with gender-related challenges, including a relatively low female labor force participation rate of 32.5 per cent despite high educational attainment among women (Central Bank of Sri Lanka, 2023).. Additionally, Sri Lanka continues to address the long-term social impacts of its 26-year civil war that ended in 2009, including the need for reconciliation between communities and the reintegration of conflict-affected populations (UNDP, 2020). Rapid urbanisation and an aging population, with 16.5 per cent of citizens above 60, present emerging social challenges that require targeted policy interventions and social protection measures (Department of Census and Statistics, 2022b).

However, Sri Lanka faced its worst economic crisis since independence in the aftermath of the COVID-19 pandemic. Indicators of the crisis included surging inflation, widespread shortages of essential goods and services such as fuel and electricity, a foreign exchange crunch, and disrupted economic activities across industries and the vital tourism sector. Unable to service its debt, Sri Lanka defaulted, which barred it from accessing international capital markets. In 2022, the country experienced a historic recession, with GDP contracting by 7.8 per cent. This economic contraction was accompanied by skyrocketing inflation that peaked at 69.8 per cent in September 2022, severely exacerbating the cost-of-living crisis for many Sri Lankan households (World Bank Group, 2024).

The International Monetary Fund (IMF) approved a 48-month Extended Fund Facility (EFF) arrangement of approximately US$3 billion for Sri Lanka in March 2023, aimed at restoring macroeconomic stability and debt sustainability (IMF, 2023). Sri Lanka has made significant progress in taming inflation from its peak of 69.8 per cent in September 2022 to 5.9 per cent in January 2024. According to the World Bank (2025) Sri Lanka's economy has made a remarkable recovery in 2024, surpassing growth expectations by recording 5 per cent growth, compared to the projected 4.4 per cent, following a contraction of approximately 3.8 per cent in 2023. However, challenges remain including the need for debt restructuring with external creditors. Sri Lanka reached an agreement in principle with the Official Creditor Committee for debt restructuring of US$5.9 billion in October 2023, and successful implementation of the IMF programme, That, along with continued structural reforms, are crucial for the country's economic recovery.

2.2. Climate change context of Sri Lanka

Sri Lanka is a Non-Annex 1 party to the United Nations Framework Convention on Climate Change and its Paris Agreement. It was one of the very early countries to ratify the Paris Agreement, demonstrating its commitment towards global climate action. As a tropical island country, Sri Lanka is highly vulnerable to the current and projected adverse impacts of climate change. According to the Climate Change Country Profile of Sri Lanka (World Bank Group & ADB, 2020), projections indicate that temperatures in the country could rise by 2.9°C to 3.5°C by the 2090s under high emissions scenarios (RCP8.5). This increase will likely lead to more than 100 days annually exceeding 35°C, significantly impacting human health and labour conditions, especially for outdoor workers.

Sri Lanka is not a heavy greenhouse gas (GHG) emitter. According to the GHG Inventory given in the Third National Communication (TNC) of Climate Change in Sri Lanka submitted to the UNFCCC (Ministry of

Environment, 2022), Sri Lanka's total GHG emissions in 2010, excluding Land Use, Land Use Change, and Forestry (LULUCF), were approximately 22,085 Gg CO_2-eq, marking a 25 per cent increase since 2000. The energy sector contributed the largest share (14,154 Gg CO_2-eq), followed by agriculture (6,506 Gg CO_2-eq), waste (976 Gg CO_2-eq), and Industrial Processes and Product Use (IPPU) (449 Gg CO_2-eq). Emissions removal through LULUCF activities accounted for 39,826 Gg CO_2-eq, creating a net emission of 3,718 Gg CO_2-eq after removal by carbon sinks. The energy sector's GHG emissions are primarily from fuel combustion in power generation and transport, reflecting the sector's dependency on fossil fuels. The agriculture sector follows, with significant methane emissions from rice cultivation and livestock. Industrial processes, notably in cement and lime production, contribute moderate emissions, whereas the waste sector adds methane emission from waste disposal. Emissions trends show a gradual rise across sectors, primarily due to economic and population growth, highlighting the need for sustainable practices and energy transitions. According to the long-term data, Sri Lanka's total emissions have been increasing at a steady phase (Figure 1). As Sri Lanka imports its entire fossil fuel requirement, the GNG emission is clearly linked to the economic growth of the country, with a potential contribution towards the balance of payments.

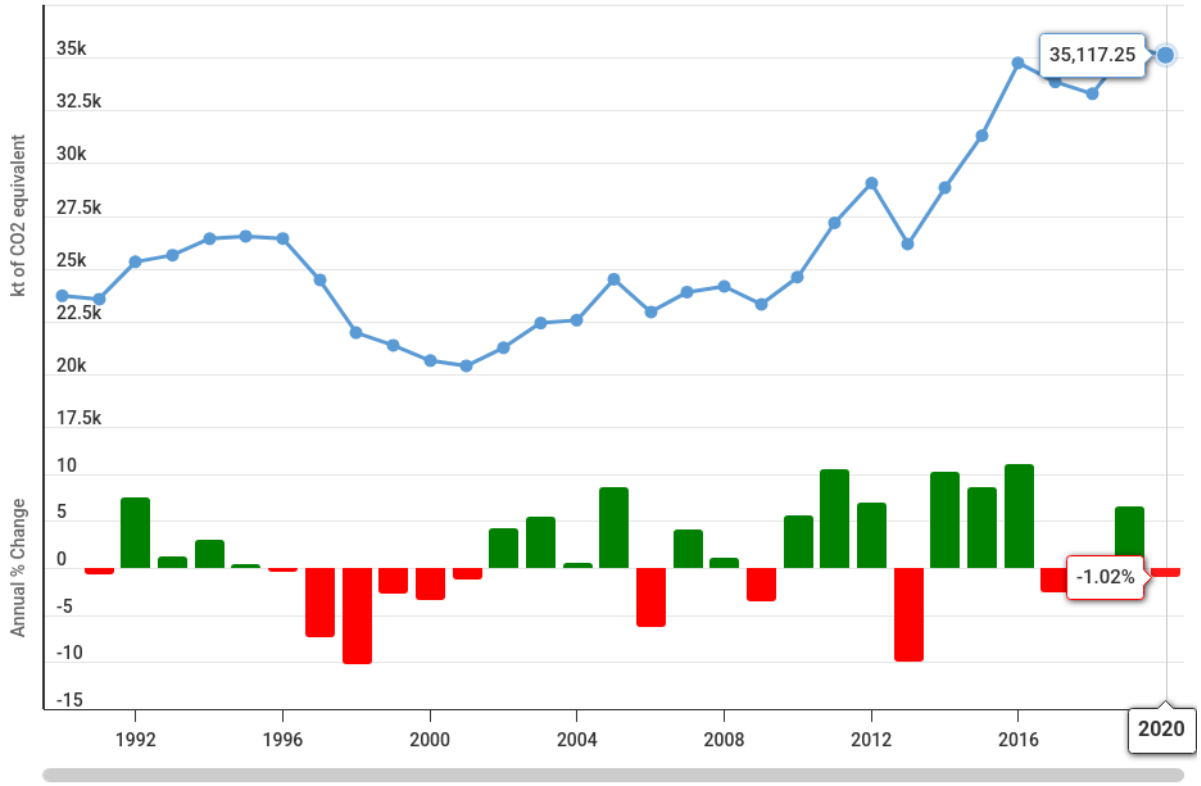

Figure 1. Sri Lanka: Greenhouse gas emissions trend

Source: Sri Lanka Greenhouse Gas Emissions (GHG) from 1990 to 2025, https://www.macrotrends.net/global-metrics/countries/LKA/sri-lanka/ghg-greenhouse-gas-emissions

Sri Lanka's greenhouse gas emissions are projected to increase significantly alongside its economic recovery and growth. According to the country's updated NDCs, under the business-as-usual (BAU) scenario, emissions are expected to reach approximately 50.47 $MtCO_2eq$ by 2030, representing a 128 per cent increase from 2010 levels (Ministry of Environment, 2021). The energy sector is projected to remain the dominant source of emissions, accounting for 53 per cent of total emissions by 2030, driven primarily by transportation and power generation needs (Asian Development Bank, 2022). The industrial sector's emissions are expected to grow at an annual rate of 6.9 per cent, reflecting the anticipated industrial recovery and expansion (Ministry of Environment, 2022). Despite these projections, Sri Lanka has committed to reducing its GHG emissions by 14.5 per cent unconditionally and 31.5 per cent conditionally by 2030 compared to BAU scenarios (Ministry of Environment, 2021). The country's Updated Technology Needs Assessment projects that implementing identified mitigation technologies could reduce emissions by approximately 7.5 $MtCO_2eq$ by 2030 scenarios (Ministry of Environment, 2014). However, achieving these targets while maintaining projected economic growth rates of 3 to 4 per cent annually will require significant international support, estimated at US$8 billion for mitigation actions alone (No Author, 2022).

2.3. Sustainable consumption and production context of Sri Lanka

Sri Lanka has demonstrated its commitment to sustainable consumption and production (SCP) through the implementation of its National Policy on Sustainable Consumption and Production, enacted in October 2019 (Ministry of Environment, 2019). This comprehensive policy framework acknowledges the country's economic progress to middle-income status and its success in poverty reduction, while also addressing the challenges of resource consumption and environmental degradation. The policy takes an integrated approach by harmonising various sectoral policies to optimise resource utilisation and minimise environmental impacts, particularly in the light of emerging challenges such as rapid urbanisation, growing infrastructure demands and evolving consumption patterns.

The country's dedication to SCP principles is further evidenced by its active participation in the 10-Year Framework of Programmes on sustainable consumption and production, with a particular emphasis on developing supportive policy instruments. Notable progress has been made in aligning national development goals with global sustainability targets, as reflected in Sri Lanka's 2022 Voluntary National Review (VNR, 2022), which reveals that seven out of 11 targets under SDG12 are fully integrated into the country's National Development Agenda. This alignment demonstrates Sri Lanka's systematic approach to embedding SCP principles into its national development framework.

3. Climate change interlinkages in the SCP policy

The overarching policy goals of the SCP policy, which interlink with climate change, offer clear guidance on the integration of SCP into the climate agenda. They are post-harvest loss reduction, private sector large companies adopting sustainable practices, waste reduction, public procurement and rationalising inefficient fuel subsidies.

Furthermore, the following thematic policy goals show a direct link to climate action.

3.1. Industry

- Make Resource Efficient Cleaner Production (RECP) compulsory by 2025 for sensitive or polluting industrial sectors
- Ensure resource-use efficiency in industries
- Transform industrial estates into eco-industrial parks by 2030.

3.2. Food

- Reduce post-harvest loss by 10 per cent by 2022 and another 20 per cent by 2030
- Reduce food waste by 10 per cent by 2022 and 20 per cent by 2030.

3.3. Construction

- Regulation amendment to ensure all state sector buildings comply with green building certifications
- Use and reuse sustainably produced materials
- Innovate resource-efficient designs and construction techniques
- Promote passive architecture to minimise waste generation and promote resource efficiency
- Promote energy- and water-efficient appliances
- Reduce energy and water consumption in state-owned buildings by 10 per cent by 2022, 15 per cent by 2025 and 20 per cent by 2030.

3.4. Tourism

- Promote SCP best practices in all tourism-related products and services
- Adopt classification criteria with SCP elements of tourist hotels and restaurants by 2022
- Encourage “Resource Intensive Tourism Sector” to set an example for resource efficiency.

3.5. Public procurement

- Adopt SCP administrative and legislative framework
- Ensure implementation of Sustainable Public Procurement in at least five major product categories in relevant sectors that have a significant impact before 2022, and in at least 50 per cent of product categories by 2030.

3.6. Waste

- Establish SCP best practices in industries, tourism, agriculture and households
- Encourage resource recovery from waste and marketing of recovered resources
- Introduce Extended Producer Responsibility (EPR) for packaging and electronics
- Introduce Polluter Pays Principle (PPP) in industrial waste, building and construction, agro-food processing, tourism and medical waste streams.

3.7. Water and sanitation

- Ensure water demand management, including the reduction of per-capita water use
- Introduce energy-efficient water treatment measures
- Reduce non-revenue-water (NRW) by at least 20 per cent by 2030
- Initiate an effective campaign on water conservation and protection.

4. SCP interlinkages in NDC

The NDC of Sri Lanka has several SCP interlinkages in most sectors. The SCP principles under each sector are as follows:

4.1. Industry

- Cleaner Production: Ensure energy efficiency, water use efficiency
- Circular Economy: Introduce life-cycle approach for greening the value chain, industrial symbiosis, zero waste
- Process Efficiency: Encourage trigeneration and fuel switching (in tea, rubber, apparel, hotel and tourism, and rice processing industries).

4.2. Waste

- Circular Economy: Recycling, segregation, preventing, avoiding or reusing municipal solid waste (MSW), composting, biogas production and market-based instruments to promote sustainable consumption.

4.3. Agriculture

- Circular Economy: Reduce post-harvesting losses
- Material Efficiency: Introduce good agricultural practices to reduce material input to get the same yield
- Production Efficiency: Grow crops with high productivity.

5. Current level of integration of SCP in NDC

Sri Lanka maintains a good status regarding the integration of SCP into various sectors. Theoretically, SCP aspects such as energy efficiency are incorporated into all sectors of NDC. Furthermore, material efficiency, cleaner production, water quality and efficiency, and sound chemical management along with Sustainable Public Procurement have been incorporated into the NDC up to a certain level in some sectors. The following sectors of the NDC have incorporated various SCP aspects:

5.1. Industry sector

Industry is one of the sectors where SCP aspects are well incorporated into the NDC. Cleaner production, circular economy and process efficiency, life cycle approach for greening the value chain, industrial symbiosis, zero waste, trigeneration and fuel switching to sustainable biomass are strong SCP aspects incorporated into the NDC.

The following activities are highlighted in the industry sector of the NDC.

5.1.1. Resource efficiency and cleaner production

- Conducting Resource Efficiency and Cleaner Production (RECP) audits and develop baselines
- Adopting RECP practices by industries
- Improving water efficiency in agro-based industries: Food and beverage, dairy, fish processing, desiccated coconut and textile finishing
- Waste minimisation, waste management, resource recovery, and sludge and sewage processing while enhancing resource efficiency in the coconut and food industry
- Promoting wastewater treatment for food and beverage, dairy, rice, and other water-based industries
- Minimising packaging, raw materials and rejection in Board of Investments (BOI) of Sri Lanka industries
- Minimising chemical use for BOI industries
- Adopting low-carbon technologies and processes for improved resource efficiency.

5.1.2. Eco-industrial parks

- Developing Seethawaka, Horana, Koggala and Mawathagama as Eco-Industrial Parks while incorporating maximum possible green industrial concepts
- Surveying all existing Industrial Parks (IPs) to assess the present level of resource efficiency and adoption of SCP best practices
- Establishing criteria for Eco-IP establishment
- Reviewing and improving the existing designs and optimising guidelines for IPs including environmental, economic and social standards
- Searching for and adapting innovative concepts from other countries, such as Life Cycle Assessment (LCA), Circular Economy (CE), eco-certification, and those related to digital economy
- Introducing holistic waste management (solid, liquid and gaseous) approach including minimisation of waste.

5.1.3. Circular economy

- Introducing the life-cycle approach for greening the supply chain
- Practicing industrial symbiosis in agro-based industries, apparel and metal industries
- Establishing a pilot project on the zero-waste concept in the apparel and hotel industries

- Adopting International Organization for Standardization (ISO) standards for the circular economy concept.

5.1.4. Tri-generation facilities

- Carrying out a rapid assessment of tri-generation potential in 10 industrial parks
- Carrying out detailed assessment in the Biyagama export processing zone
- Implementing one tri-generation facility as a pilot project in the Biygama IP.

5.1.5. Other tools and instruments

- Facilitating the entry of environment-related ISO-certified companies in the Sustainable Public Procurement system in Sri Lanka
- Ensuring the availability of sustainable biomass for industrial use.

5.2. Waste sector

The main driving principle of the waste sector is the circular economy. NDC of the waste sector is based on the 3R principle of waste management, giving high priority to waste reduction. Under the waste sector, introducing necessary legislation to make segregation of waste at the household level is mandatory. Furthermore, market-based, and non-market-based instruments are incentivised to promote sustainable consumption patterns.

The following activities are highlighted in the NDC which interlink with SCP:

5.2.1. Improving circular economy

- Preventing, avoiding or reducing MSW by reducing the growth rate by 10 per cent
- Increasing the number of waste segregation categories from two to three (perishable, potential recyclable, residual) at source
- Increasing the current recycling percentage in the Western Province and the rest of the country (trash reverse vending machines, new tech separators etc.)
- Ensuring recycling of PET bottles, 30 per cent by weight
- Ensuring recycling of High Impact Polystyrene, 15 per cent by weight
- Ensuring recycling of Tetra Packs, metalised films and other recyclable packaging materials, 15 per cent by weight.

6. SCP and NDC interlinkages

The following table (Table 1) shows the climate change interlinkages in the SCP policy and SCP interlinkages in NDC under different sectors and subsectors.

Table 1. Sector-wise Interlinkages of Climate Change in SCP Policy and of SCP in NDC

Source: Author

Sector	Climate linkages in SCP	SCP linkages in NDC
Tourism Industry	• Regulatory framework strengthened to increase the use of SCP best practices in the tourism industry • Classification criteria with SCP elements for tourist hotels and restaurants set up by 2022 • Eco-tourism encouraged following international standards.	• Continuing fuel-switching to sustainable biomass energy and improving user efficiency • Building resilience through sustainable tourism practices • Reviewing and updating existing Green Building Guidelines (GBG) specific to tourism to include climate change and ecological aspects.
Textile Industry	• Applying RECP in all textile industrial units • Facilitating the transformation of existing textile industrial units into more resource-efficient and environmentally friendly units • Promoting new textile enterprises producing sustainable products and services in a resource-efficient manner leading to near zero pollution over the life cycle • Sharing knowledge, best practices and techniques to improve the delivery of RECP services • Encouraging sourcing, transferring and local adaptation of environmentally-sound technologies and promoting state-of-the-art technologies for high-polluting and resource-intensive textile industrial units to become more sustainable • Making access to green finance, especially for small and medium-sized enterprises (SMEs) investing in environmentally-friendly products and services. • Enhancing the application of green reporting in all textile industrial units.	• Improving water-use efficiency • Textiles identified as one of the most significant export-oriented sub-sectors.

Sector	Climate linkages in SCP	SCP linkages in NDC
Building and Construction	• Amending local authority regulations to ensure that all state-sector buildings constructed in the future should comply with Green Building Certification specifications • Reducing specific energy and water consumption in state-owned or controlled buildings by 10 per cent by 2022, 15 per cent by 2025 and 20 per cent by 2030.	• Implementing the Energy Efficiency Building Code on a mandatory basis • Piloting at the national level in industries, industrial parks and apartment buildings policy initiatives that discourage the use of treated water for other purposes • Introducing by-laws and building codes for reuse of wastewater in new industrial constructions including areas under industrial estates • Promoting climate resilience in the tourism sector by introducing green building design in all new constructions and refurbishments.
Food Sector	• Reducing food losses in the supply chain (pre/post-harvest) by 10 per cent by 2022 and another 20 per cent by 2030 • Reducing food waste by 10 per cent by 2022 and another 20 per cent by 2030 • Ensuring waste minimisation, waste management, resource recovery, and sludge and sewage processing while enhancing resource efficiency.	• Ensuring waste minimisation, waste management, resource recovery and residual (sludge and sewage) processing while enhancing resource efficiency • Reducing post-harvest losses and ensuring value addition of fruits and vegetables.
Waste Sector	• Establishing SCP best practices for waste management in all sectors, especially industry, agriculture, tourism and households • Developing activities and responsibilities for resource recovery from waste, and innovative marketing of recovered resources.	• Preventing, avoiding or reducing MSW generation by reducing its growth by 10 per cent by 2030, and by reducing the generation of industrial solid waste and effluent • Improving waste recycling to 7 per cent on a collection basis in the Western Province (WP) and 5 per cent in other provinces by 2030.
Water Sector	• Ensuring water demand management including the reduction of per-capita water use • Introducing energy efficiency measures in water treatment and distribution • Launching an effective campaign to educate and discipline people on best practices and importance of water conservation and protection.	• Improving water-use efficiency in food and beverage, dairy, fish processing and desiccated coconut sectors.

7. Results of the expert consultations

The level of awareness of SCP, sectors to be prioritised and potential opportunities for SCP integration into NDC were identified through expert consultations. Various opinions and insights from different experts have been summarised under each sector for consideration and analysis.

7.1. Level of awareness of SCP among stakeholders

7.1.1. Government sector

The government stakeholders have a basic understanding of the Sustainable Development Goals (SDGs) and their significance. Awareness of SCP has gradually increased over time, with the Ministry of Environment staff generally exhibiting a broader knowledge compared to other ministries. However, even within the Ministry of Environment, not all staff members possess systematic knowledge to effectively formulate SCP policies.

While government ministries were briefed on SCP during the policy development process, the new generation of staff lacks awareness of SCP principles since they were not included in the initial project. While scattered knowledge exists of SCP tools related to energy efficiency, carbon footprint, recycling and other areas, systematic understanding of SCP remains limited.

Some individuals, particularly within institutions such as the Ministry of Environment, have a deeper understanding of SCP principles and tools. However, to effectively integrate SCP aspects into NDC, a comprehensive understanding of SCP tools and principles is essential across all levels of government.

7.1.2. Private sector

In the private sector, awareness of sustainable consumption and production varies widely across industries. While many industries prioritise SCP elements such as material and energy productivity, and circular material flows, some groups are still disinterested due to its perceived irrelevance to production or failure to recognise the co-benefits of material efficiency and cost saving, including concerns about the quality of recycled products. Climate change has prompted most industries to focus on energy efficiency, but material efficiency receives less attention. Larger corporations with dedicated sustainability departments tend to have a better understanding of SCP and its relationship with climate change. The private sector's shift towards SCP is primarily driven by export conditions, product quality enhancement, improved work environments and cost efficiency. However, SMEs often lack the knowledge or motivation to adopt SCP practices. While production processes have garnered attention, consumer-side consumption stays inadequately addressed, particularly among the general public.

7.1.3 Academic sector

The academic sector serves as the primary disseminator of knowledge to government, private and civil society sectors about SCP. Academia, encompassing not only environmental disciplines but also various other fields, has actively engaged with the SCP sector. However, it is notable that a consistent set of academic experts tends to participate in SCP projects across different initiatives. While these experts bring valuable insights, there is also a gradual influx of new experts entering the sector over time. This transition ensures fresh perspectives and diverse expertise, enriching the SCP discourse and enhancing the effectiveness of SCP initiatives.

7.2 Opportunities to incorporate SCP in different sectors

7.2.1 Tourism

The tourism sector holds a prominent position in both the SCP policy and NDC due to its significant contribution to the economy of Sri Lanka. Moreover, the sector is considered feasible for implementing projects because the majority of stakeholders operate within the formal sector. This makes it conducive for starting and executing SCP initiatives aimed at promoting sustainable practices and minimising environmental impacts within the tourism industry.

The tourism sector has gained significant attention in both the mitigation and adaptation of NDCs. The following interventions are highlighted in the NDC:

- Fuel switching to biomass
- Adopting efficient chillers and refrigeration technologies
- Implementing sustainable tourism practices guidelines
- Promoting green building initiatives.

Tourism stands out as a priority economic sector in the SCP policy highlighting the need to

- Develop tools for implementing and monitoring sustainable impacts
- Establish best practices for all tourism-related products
- Encourage resource-efficient tourism and integrate climate and disaster resilience into tourism sector development.

Sri Lanka Tourism Strategic Action Plan (2022 to 2025) proposed the activities listed below for a sustainable and environment friendly tourism.

- Establishing an internal division dedicated to championing Sustainable Tourism
- Developing and launching Sri Lanka Tourism's Sustainability Road Map
- Working in collaboration with Mahaweli Development Authority to develop an Eco-Tourism Development zone in Kaluganga and Moragahakanda
- Preparing and implementing green building guidelines for new investments
- Sigiriya to be developed as the first Sustainable Destination.

A separate National Policy and Strategy on Cleaner Production has been crafted specifically for the tourism sector to further embed SCP practices. However, the implementation of such activities has been delayed due to several reasons. Several initiatives have been undertaken by both large hotel chains and individual hotels on their own to implement SCP practices. However, most of these efforts were not accounted for even in earlier NDC development processes. As per experts, the sector needs to be encouraged to transition towards community-based or village-based tourism models rather than relying solely on large hotels. Engaging rural youth in tourism activities can empower them to advocate for SCP principles. Local authorities in Sri Lanka are urged to take the lead in spearheading tourism initiatives within their respective regions.

The EU SWITCH-Asia programme initiated a project in 2013 aimed at incorporating SCP practices into the hotel industry, which has achieved significant success. The project has resulted in approximately Sri Lankan Rupees (LKR) 250 million in savings, an 8.29 per cent reduction in energy use, a 20 per cent decrease in solid waste, and a 14 per cent reduction in water discharge.

7.2.2. Textile industry

The textile sector is one of the most significant export-oriented sub-sectors of the industry sector, whose contribution constitutes 6.3 per cent of the GDP, 40 per cent of exports, and employs over 300,000 workers. It depends mostly on international markets such as the EU and North America. The EU is one of the largest export markets for Sri Lanka's textile industry, making it a key driver of sectoral growth. As the EU advances toward its carbon neutrality goals by 2025, emerging policies and regulations are expected to have significant market implications for Sri Lankan textile exports, particularly in terms of sustainability standards and

carbon footprint requirements.. Therefore, the textile sector is already prioritised within the sector due to its contribution to greening the value chain.

The textile sector is a major consumer of energy and electricity, mainly from fossil fuels and electricity, and a source of GHG emissions from industrial processes and waste generation. The sector, therefore, needs external support to meet its environmental targets and building standards, and to achieve process certifications.

The NDCs also aim to enhance the application of RCEP practices, such as water-use efficiency, waste minimisation and green procurement. The NDCs are aligned with the SDGs, especially SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 12 (Responsible Consumption and Production).

The SCP policy document outlines policy statements and goals for promoting SCP in the textile sector, such as

- Applying resource efficient cleaner production in all textile industry units
- Facilitating the transformation of the existing textile industry into a more resource-efficient and environmentally friendly industry
- Promoting new textile enterprises producing sustainable products and services in a resource-efficient manner leading to near zero pollution over the life cycle
- Sharing knowledge, best practices and techniques to improve the delivery of RECP services
- Encouraging sourcing, transferring and local adaptation of environmentally sound technologies and promoting state-of-the-art technologies for high polluting and resource-intensive textile industrial units to become more sustainable
- Making access to green finance, especially for small and medium-sized enterprises investing in environmentally friendly products and services
- Enhancing the application of green reporting to all textile industrial units.

The SCP policy document identifies the Ministry in Charge of Industry as the leading ministry for implementing the SCP policy for the textile sector. It also lists supportive ministries and agencies, such as those in charge of environment, disaster management, science and technology, education, water supply, energy, health, higher education, mass media and communication, finance and national policies.

Keeping in mind the implementation of international regulations with respect to textile waste and textile design, particularly from the EU, the Sri Lankan textile industry stands to benefit by adopting various circular textile approaches, tools, and techniques. Considerable public and private sector support is being channelled from the EU to textile-producing and exporting countries.

7.2.3 Building and construction

The building and construction sector is addressed mainly under the industry sector, the urban planning and human settlement sector, and the tourism and recreation sector. The industry sector NDCs include promoting green building design and construction, resource-efficient and cleaner production, eco-industrial parks, circular economy, and low-carbon technologies and processes. The urban planning and human settlement sector NDCs include enhancing the climate resilience of urban infrastructure and services, promoting low-carbon and energy-efficient buildings, integrating climate change into urban planning and development, and improving solid waste management. The tourism and recreation sector NDCs include promoting climate resilience in the tourism sector by introducing green building design to all new constructions and refurbishments, building resilience through sustainable tourism practices and improved risk preparedness, and introducing risk reduction and risk transfer mechanisms for climate-induced disasters affecting tourism. The document estimates the cost implications and external financial support needed for implementing the NDCs, as well as the alignment with the Sustainable Development Goals and the gender integration and social inclusion aspects.

The SCP policy principle of the Building and Construction sector is “Environmentally sustainable and socially acceptable, economically viable and culturally acceptable disaster resilient, liveable cities, villages and shelters”. The SCP policy outlines several policy statements to enhance sustainability in the building sector, such as using and re-using sustainably produced materials, promoting passive architecture and energy and

water-efficient appliances, and developing guidelines and legislation for sustainable building construction. The SCP policy has set policy goals to be achieved by 2030, such as introducing building management systems and green building certification, reducing energy and water consumption in state-owned or controlled buildings, setting benchmarks for energy performance for various categories of buildings, and having a model Smart City in the Western province.

Building standards in the construction sector play a critical role in promoting resource, water, and energy efficiency. For instance, adopting green building principles for all new buildings could significantly reduce material consumption and set a strong precedent for sustainable practices across the sector.

7.2.4 Food processing

The food sector emerged as one of the prioritised sectors during the extensive stakeholder consultations held during the formulation of the SCP policy. The sub-sectors selected during the SCP policy formulation include tea, dairy and rice processing.

Medium and large-scale food processing industries have integrated SCP practices into their operations through exposure to various projects over time. However, mega industries possess even greater potential and can make a substantial impact in terms of material efficiency and waste minimisation, which are critical for Sri Lanka's food security. These include fishery, rice processing, dairy and related value-added industries, all of which show a high potential for integrating SCP principles. In certain food industries, the entire value chain is situated within the country, facilitating the seamless incorporation of SCP aspects.

7.2.5 Mining

The mining sector, including graphite, dolomite and phosphate , is often overlooked in discussions on sustainable development. It is crucial to accurately assess their emissions and recognise the importance of implementing strategies to minimise mineral wastage throughout mining, packaging, storage and transportation processes.

Specifically, sand mining is predominantly operated by the informal sector and faces inefficiencies in its transportation methods. Studies show that 15 to 20 per cent of sand is lost during transportation. Therefore, incorporating the railway system for sand transportation instead of relying solely on road transport, and packaging sand based on its fineness for market distribution rather than transporting it in bulk (like cement), can significantly reduce wastage during handling and distribution.

Depending on where mined materials are used (construction, manufacturing, exports), opportunities for material recovery could be identified. For instance, the reuse and recycling of sand, including materials from construction and demolition waste, could reduce the demand for new sand extraction. Additionally, innovative practices like using ore-sand (a byproduct of mining) or repurposing materials like plastic sand and crushed glass could be explored for technological and economic viability, and pursued through private sector participation and public sector support.

7.2.6 Other sectors

- In the agriculture sector emphasis should be placed on mitigating post-harvest losses occurring during storage, transport, loading and unloading. This includes optimising transportation methods and introducing transfer stations. Reduction of food losses is imperative as the agriculture sector contributes to methane emissions.
- Resource efficiency within the manufacturing sector and thoughtful product design are pivotal components of circular economy and SCP practices. They have the potential to mitigate emissions linked to raw material usage and waste management processes.

8. Analysis of SDGs with reference to resource efficiency in SCP

Resource efficiency is a key component of many Sustainable Development Goals, particularly SDG 12, Responsible Consumption and Production. Under this SDG, several targets highlight the importance of efficient resource utilisation, including Target 12.2, which focuses on the efficient use of natural resources, and Target 12.3, aimed at reducing food loss and waste. Additionally, Target 12.4 emphasises environmentally-sound management of chemicals and waste, whereas Target 12.5 promotes sustainable waste reduction through the principles of Reduce, Reuse and Recycle (3R). Furthermore, Target 12.7 encourages sustainable public procurement practices, which directly contribute to resource efficiency.

While SDG 12 demonstrates strong linkages with resource efficiency, other SDG targets also contribute to this goal to varying degrees. For instance, SDG 4 (Quality Education) promotes acquiring knowledge and skills in sustainable lifestyles, which can enhance resource efficiency in the long term. Similarly, Target 6.4 of SDG 6 (Clean Water and Sanitation) focuses on water-use efficiency across all sectors to ensure sustainable water resource management. Moreover, Target 8.4 of SDG 8 (Decent Work and Economic Growth) aligns with SDG 12 by aiming to decouple economic growth from environmental degradation and improve global resource efficiency. SDG 9 (Industry, Innovation and Infrastructure) emphasises resource efficiency in Target 9.4 by promoting the adoption of clean technologies and environmentally sound industrial processes. Additionally, SDG 11 (Sustainable Cities and Communities) emphasises resource efficiency at the city level in Target 11b, and Target 14.7 of SDG 14 (Life Below Water) aims to ensure sustainable use of marine resources, including fisheries and tourism.

Overall, resource efficiency is a cross-cutting theme that underpins the achievement of multiple SDGs, highlighting its critical importance in sustainable development efforts.

9. Strengthening SCP in Sri Lanka: Key takeaways from the national workshop

SWITCH-Asia Policy Support Component (PSC) steered a national workshop aiming to achieve three objectives: Sharing and validating key policy research findings, understanding the perspective of stakeholders on the importance of SCP and Circular Economy integration in revised NDCs, and strategising policy solutions to deploy SCP/CE strategies for enhancing climate ambitions with sectoral prioritisation. Through collaborative discussions, plenary sessions and group work, the workshop explored challenges and opportunities in integrating climate actions with SCP, contributing to sustainable development and climate resilience.

The government plays a crucial role in facilitating sustainable transitions by providing policy support and creating enabling environments for private-sector engagement. Initiatives such as climate financing and innovative business models can incentivise sustainable practices. Collaboration between government, private sector and civil society is vital for implementing comprehensive sustainability strategies.

Maximising resource efficiency through technological advancements and sustainable practices is essential for driving systemic transformations. Strategic allocation of limited resources can maximise climate co-benefits. Furthermore, integrating economic and social pillars can enhance sustainability efforts, creating synergies between economic development and environmental conservation.

Despite ongoing discussions on climate issues, significant challenges persist, particularly concerning the private sector's reluctance to adopt sustainable practices. Certain gaps in the private sector require capacity building, knowledge sharing and data-driven policy decisions. Additionally, understanding the holistic impacts of climate interventions, such as transitioning to electric vehicles and alternatives to plastics, is crucial. Moreover, issues like food waste management, public awareness and effective waste management systems require attention to drive resource efficiency and gain climate co-benefits.

9.1. Mapping priorities

The prioritisation of sectors and sub-sectors needs to align with the high resource-intensive sectors to achieve meaningful results. The discussion showed moving beyond sector-based problem solving and adopting innovative approaches that yield multiple benefits. Embracing industrial symbiosis fosters resource efficiency by utilising resources from one industry in another.

9.1.1. Stakeholder engagement

Engagement with stakeholders is crucial for the effective integration of SCP into NDC to enhance the climate ambitions. However, adopting a top-down approach to gathering insights from policymakers as well as industrial stakeholders is vital to ensure effective policy implementation and collaboration across all levels of governance. By involving key stakeholders, mitigation measures specific to key sectors need to be identified, ensuring a holistic approach to addressing climate and SCP concerns.

Experts highlighted the role of chambers and industry associations such as the Sri Lanka Food Processors Association and Sri Lanka Food and Vegetables Association in facilitating collaboration and knowledge sharing to foster SCP initiatives across sectors. Furthermore, engagement with industry representatives, environmental organisations, and community stakeholders is essential to garner support and ensure inclusive decision-making processes.

9.1.2. Capacity building

Identifying opportunities in climate financing for the private sector is important. However, there is a certain gap, especially in the SMEs, concerning climate financing. The complexity of procedures, documentation and low climate impact have impeded SMEs from tapping opportunities in climate finance.

Stakeholders highlight the necessity to strengthen capacities at the local authority level in both knowledge

and infrastructure. Simplifying policies and procedures, and enhancing trust levels were underscored as essential steps in optimising waste management practices.

9.1.3. Waste management

Research and development were identified as pivotal, with suggestions to improve product design in the private sector to maximise material efficiency. There are some policies which hinder the development of the recycling sector, such as policy decisions preventing bottle-to-bottle recycling of PET bottles, which were noted. The change of such policies along with scientific studies, stakeholder consultation and supporting regulatory frameworks can have a ripple effect on **plastic waste management**.

Integration of SCP principles with climate agenda requires policy interventions as well as economic instruments (e.g., polluter pays principle, carbon emissions tax). Strategies such as EPR and deposit-refund systems serve as policy levers to incentivise sustainable practices. For instance, the absence of proper incentives for plastic waste collection worsens waste accumulation, contributing to environmental degradation and exacerbating the waste crises.

The **fishing sector** was identified as an area of concern due to the prevalence of abandoned nets and discarded fishing gear, emphasising the importance of adopting sustainable fishing waste management practices.

Challenges related to **chemical waste management** were underscored within the printing and leather industries, highlighting the need for SCP interventions to address chemical waste generation and disposal issues effectively. The chemical industry, particularly in the context of battery production, emerged as a sector suitable for SCP integration, with potential avenues for implementing EPR schemes to manage end-of-life batteries.

The **textile industry**, particularly focusing on the natural dyes segment, was identified as having the potential for achieving zero discharge of hazardous substances, thereby promoting environmental sustainability. Stakeholders also emphasised the importance of improving fabric-to-fabric product design, thereby promoting circularity and resource efficiency within the garment industry.

In the **food sector**, a supply-demand focus was emphasised in terms of food security, with discussions centring on the concept of food banks to minimise food waste and ensure equitable distribution. Coconut kernel and rice production were recommended for this, considering the large production to cater to the in-country demand, which presents opportunities for reducing waste and enhancing resource efficiency.

The **rubber industry**, particularly tyre manufacturing, was highlighted as having potential for SCP interventions, with a focus on implementing EPR measures.

The **packaging industry**, particularly in terms of utilising recycled materials and adopting sustainable practices in food-grade packaging, was recognised as a key area for SCP interventions, aiming to minimise waste and promote circularity.

9.2. Challenges

During the consultations, stakeholders identified several challenges to integrating SCP into NDCs, as outlined below. While most of these challenges relate more directly to NDC implementation rather than SCP integration per se, acknowledging them remains crucial for developing effective NDC implementation strategies—a fundamental component of the overall NDC process.

9.2.1. Private sector reluctance to investment

The profit-driven nature of the private sector impedes the adoption of sustainable practices due to perceived risks or uncertainties about returns on investment. Infrastructure changes necessitate investments, yet the private sector remains profit-oriented, posing a barrier to sustainable initiatives despite potential benefits, such as increased efficiency and cost savings. Furthermore, convincing higher management to invest in sustainability remains a challenge. The importance of addressing policy gaps, developing necessary regulatory frameworks, providing adequate incentives, developing business models and enabling market instruments pave the way for the private sector to play a key role in resource efficiency and climate change.

9.2.2. Lack of data and policy gaps

The absence of comprehensive data availability undermines effective policy formulation and implementation. Policy decisions based on irrelevant or incomplete data yield ineffective outcomes and fail to obtain buy-in from the private sector. For instance, introducing paper-based alternatives to plastic straws without understanding their full life cycle or accurately assessing the impact on other environmental impact categories leads to misguided interventions. Additionally, inadequate waste management exacerbates environmental degradation and hampers sustainability efforts. Difficulties in setting baselines and Key Performance Indicators (KPIs) arise from data unavailability and poor data flow from the private to government sector, posing challenges for monitoring and evaluation efforts.

9.2.3. Technological limitations

Industries face obstacles due to limited access to technologies and funding. Additionally, the migration of skilled youth contributes to the scarcity of a competent workforce.

9.2.4. Poor implementation of NDC action plans

The ineffective integration of SCP practices is largely attributed to the weak execution of NDC. Particularly, the NDC implementation plan lacks clarity about the assignment of responsibilities to government organisations. It does not specify which organisation is accountable for executing particular aspects of the plan, contributing to its inefficiency.

10. Recommendations and the Way Forward for SCP integration into NDCs

1. **Enhance Private Sector Engagement in the NDC Process -** A significant share of SCP actions—including improvements in material resource efficiency—can and should be undertaken by the private sector, particularly in manufacturing and industrial sectors. To ensure effective integration of SCP principles into NDCs, it is essential to actively involve the private sector throughout the NDC process. Governments should recognize the private sector as a key implementation partner and promote its leadership and commitment in aligning business practices with SCP and climate goals. Facilitating structured, transparent, and continuous engagement mechanisms for the private sector—across planning, implementation, and monitoring stages of NDCs—will enhance both ambition and impact.
2. **Public awareness** is essential to foster behavioural changes and promote responsible consumption, especially in the plastic waste management sector. While plastic serves critical purposes, its arbitrary use contributes to environmental pollution. Awareness should be supplemented by availability of affordable, practical, convenient and accessible alternatives.
3. **Proper waste management systems** are imperative to mitigate environmental harm. Extended Producer Responsibility (EPR) schemes can incentivise producers to take responsibility for their products' end-of-life management, reducing environmental impacts. EPR often unlocks resources to fill the gaps in waste management starting from sorting and collection to various activities to derive value from the materials, thereby reducing the stress on existing landfills and the need for increased capacities.
4. **Fostering dialogues among stakeholders** within the prioritised sectors and enhancing their understanding of SCP and its co-benefits for cost efficiency and the environment are essential for effective SCP integration. Thus, conducting a comprehensive stakeholder analysis to develop a more accurate stakeholder mapping is crucial to facilitate dialogue and collaboration among stakeholders. This process ensures that all relevant parties are identified and engaged in the SCP initiatives, leading to more informed decision-making and effective implementation of SCP practices.
5. **Identifying prioritised sectors and sub-sectors for the next phases** is crucial for the Ministry of Environment to facilitate the integration of SCP. Ideally, focusing on one or two sectors/sub-sectors facilitates a stronger incorporation. During the identification process, consideration of greenhouse gas hotspots associated with material used in the economy and the socio-economic context of the prioritised sectors/sub-sectors are important for effective implementation.
6. **A strong Measurement, Reporting and Verification (MRV) mechanism** is important during the implementation of the SCP-related NDC. A collective agreement on MRV mechanism is especially important with the private sector. It could be the use of existing mechanisms such as the Environmental Protection License (EPL) or a new mechanism.
7. **A comprehensive awareness programme on SCP and circular economy tools and principles** is essential for all parties involved in the enhancement process of NDC, including the Government sector, private sector, academia and experts. This programme should precede the commencement of the NDC enhancement process. Moreover, the capacity development of the Climate Change Secretariat and the Environment Planning & Economics Division of the Ministry of Environment is vital for the successful incorporation of SCP into the NDC enhancement process. This will ensure that these key entities are equipped with the necessary knowledge and skills to effectively integrate SCP principles into climate action strategies.
8. **A guiding document for the leading ministries to facilitate the NDC enhancement process** will be developed by the Ministry of Environment, supported by an external consultant . This document will serve as a comprehensive reference for the technical committees appointed by each leading ministry in their respective sectors. Ensuring a close working relationship between the Ministry of Environment and the external consultant is crucial for incorporating SCP aspects into the guiding document. This collaboration will enable the seamless integration of SCP principles into the NDC enhancement process across various sectors, fostering alignment with sustainability goals and objectives.

9. It is highly recommended that **the technical groups within all leading ministries involved in the NDC enhancement enhance their capacity to identify SCP aspects within their respective ministerial plans**. Throughout the technical meetings of the NDC enhancement process, each ministry will ensure close consultation to identify SCP aspects within their plans and integrate them into the next NDC. This collaborative effort will ensure that SCP considerations are thoroughly incorporated into the national plans and strategies, promoting sustainable development objectives.
10. **As the concepts of SCP and CE go hand-in-hand, it is important to consider both aspects within the NDCs** and Long-Term Low Greenhouse Gas Emission Development Strategies (LT-LEDS). Although it is challenging to develop specific quantified targets during the NDC 3.0 development timeframes, what is possible is to develop key intermediary milestones up till 2030, creating a background and a platform to develop specific subsector targets during the next NDC enhancement cycle. It is therefore also important to identify the important sub-sectors and sub-sector specific approaches towards this.

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