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Sustainable consumption and production baseline and awareness assessment report for Sri Lanka

National level and sub-sectors of food/beverage industry

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This document has been prepared by the above experts and
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- The professionals from range of institutions in the public and private sectors who participated and contributed in the stakeholder inception workshop (28 April 2016) and validation workshop (27 October 2016).
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ABBREVIATIONS

CTC	Cut, Twist and Curl (teas)
EC	European Commission
EU	European Union
EUD	Delegation of the European Union to Sri Lanka and the Maldives
GPP	Green Public Procurement
FBD	Fluid Bed Drying (automatic control system for tea drying)
HDI	Human Development Index
MoMDE	Ministry of Mahaweli Development & Environment
MT	Made Tea
NCSD	National Council for Sustainable Development
NPSC	National Policy Support Component
RECP	Resource Efficient and Cleaner Production
SDG	Sustainable Development Goal
SC	Sustainable Consumption
SCP	Sustainable Consumption and Production
SEC	Specific Electricity Consumption
SFC	Specific Firewood Consumption
SL	Sri Lanka
SME	Small and Medium sized Enterprise
SP	Sustainable Production
SLSEA	Sri Lanka Sustainable Energy Authority
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
10YFP	10 Year Framework of Programmes on Sustainable Consumption and Production

GLOSSARY

Carbon footprint	Total set of greenhouse gas emissions caused by a [region, individual, event, organisation, product] expressed as CO2e.
Domestic material consumption	Extraction of materials through mining and agriculture, plus imports, minus exports.
Energy footprint	Total amount of energy used by a [region, individual, event, organisation, product], including Agriculture, Mining and Energy, Manufacturing, Construction, Transport, Services.
Gini index	Measure of statistical dispersion intended to represent the income distribution of a nation's residents, and is the most commonly used measure of inequality.
Human Development Index (HDI)	Composite statistic of life expectancy, education, and per capita income indicators which are used to rank countries.
Income groups	Based on the Department of Census and Statistics (2013), Household Income and Expenditure Survey 2012/13, the income levels in Sri Lanka are defined as: • Low income: lower than 13,000 Rupees per month (about 20% of Sri Lanka population). • Medium income: between 13,000 and 45,000 Rupees per month (about 60% of population). • High income: More than 45,000 Rupees per month (about 20% of population).
Material footprint	Amount of resources that can be attributed to final demand (consumption and capital investment) in a country. Including Agriculture, Biomass, Construction, Fossil Fuels, Manufacturing, Metals, Minerals, Mining & Energy, Services, Transport. Data on the footprint of imports and exports is used to calculate the material footprint.
SCP awareness	SCP awareness is being regarded as a key factor to make people change their behaviour towards SCP. The term “SCP awareness” in general refers to: 1. The knowledge on SCP “as a whole”. 2. The knowledge on state-of-the-art or on the state of information about SCP matters and factual issues. 3. The mind set and behaviour. SCP awareness can be understood in the sense of a general overarching principle of lifestyle and of industrial production mode, and at the same time can be linked to some concrete issues.
Sustainable consumption and production (SCP)	SCP is the use of services and related products which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emission of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations (ISSD 1994). SCP is a holistic approach to minimising the negative environmental impacts from consumption and production systems while promoting quality of life for all” (UNEP 2011).
Total primary energy supply	Energy produced domestically, plus imports, minus exports.
Water use	Measured by recorded extraction from the water system.

EXECUTIVE SUMMARY

SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka (SWITCH-Asia SCP NPSC SL)

This baseline assessment is carried as part of the SWITCH-Asia SCP NPSC SL. The overall objective of this 4-year project is to support the Sri Lankan Government in selecting, adapting and implementing suitable economic and regulatory policy instruments to promote sustainable consumption and production, thereby enhancing the long-term sustainable consumption and production (SCP) patterns.

Rationale for the baseline assessment

While urbanisation is spreading along with increasingly unsustainable SCP patterns, the aspirations of the market based economic systems are changing the consuming and producing behaviours in the country. A baseline study provides the basis for identifying potential interventions for promoting sustainable consumption and production with consumers and business sectors. To ensure the effective implementation of national SCP related policies, a SCP monitoring system with an indicator framework will have to be established. In summary, the purpose of SCP indicators is to assist in monitoring progress towards SCP objectives, monitoring trends in areas of key relevance to SCP, benchmarking with patterns of consumption and production in other countries, and raising awareness of the importance of SCP and to improve accountability.

Objectives and scope of work of the baseline assessment

Objectives of baseline assessment	Activities
• Understand the present level of Sustainable Production (SP) and SCP penetration and awareness in selected pilot sub-sectors (dairy, tea and rice processing) of the food and beverages sector in Sri Lanka. • Understand the present level of Sustainable Consumption (SC) patterns and level of awareness of Sri Lankan consumers. • Assess the current state of play of the three pilot sub-sectors and national level in Sri Lanka in relation to SCP indicators and monitoring. • Draw lessons from international reference materials and experiences in the development and implementation of SCP indicators. • Establish a set of clearly defined and prioritised SCP indicators for the three pilot sub-sectors (dairy, tea and rice processing) and national level. • Set baseline values for set of prioritised SCP indicators at national and sub-sectoral levels so that future patterns of SCP can be monitored over a period of time. • Set up a principle framework with national SCP indicators and their baseline values, including references to international benchmarks. Such framework can provide the basis for the establishment of an indicator based national SCP monitoring system to promote effective change towards more SCP practices in Sri Lanka.	• Collect and summarise information on existing SCP related monitoring systems and SCP indicators already used by Ministry of Mahaweli Development and Environment (MoMDE) and other ministries/organisations. • Review a draft long-list of potential indicators and suggest a set of prioritised SCP indicators for the pilot sub-sectors (dairy, tea and rice processing) and national level. • Collect and summarise information on international good practices. • Operationalise SCP indicators and prepare an enhancement plan with a modest, relevant and practical set of indicators. • Evaluate the current situation and on-going SCP initiatives at national level and pilot sub-sectors, including existing SCP indicators and related monitoring systems in the country. • Prepare questionnaires and methodology for surveys in three pilot sub-sectors and a national consumer survey. • Facilitate inception stakeholder workshop (28 April 2016) to validate the draft set of SCP indicators and draft questionnaires developed for pilot sub-sectors and consumers. • Undertake training session with local consultants (ISB) to undertake the surveys in pilot sub-sectors and with consumers. • Analyse results from production and consumer surveys undertaken by consultants (ISB). • Set baseline values of SCP for pilot sub-sectors and national level, and benchmark these values against international values. • Facilitate stakeholder consultation workshop (27 October 2016) to review and endorse the SCP indicators, baseline values and suggestions on SCP monitoring systems. • Write the SCP baseline study report (this report).

Conclusions

The conclusions from this baseline and awareness assessment are:

- *Current situation on SCP indicators and monitoring:* There are currently no integrated or formalised monitoring schemes for SCP in place at national or sub-sectoral level. At the moment individual institutions develop and monitor their own indicators (e.g. energy, water, waste, greenhouse gas emissions, sub-sectoral specific parameters). Given the increasing importance of SCP-related issues and the SDGs, there is a clear need for integrated monitoring solutions.
- *International experiences:* Many countries have strategies and indicators covering SCP. As demonstrated throughout this baseline report, there are opportunities for Sri Lanka to learn from

international experiences and data sets (e.g. UNEP work on SCP indicators as part Regional SWITCH Asia Component). However, the review of international experiences shows that there is no "one size fits all" solution for national SCP indicators and monitoring.

- *Consumer survey:* The survey undertaken with a sample of 500 people in Sri Lanka showed that about half of consumers have no or low awareness on SCP related issues, with awareness to reduce wasteful consumption the highest (58%) and awareness on green products the lowest (32%). People with higher income have overall higher awareness, and willing to pay a higher price for green products. However, people with higher income use less public transport. As expected, low income groups were reluctant to pay extra for green products. Most of the purchases seem to be based on price, quality and expiry date. Less attention seems to have paid to health or environmental issues in consumer purchasing decisions. When asked about the SCP priorities to be addressed in Sri Lanka, responsible use, reduction, and disposal of resources (materials, waste, water) ranked as highest priority while energy efficiency, green products, and people's lifestyles were not in top three priorities of consumers.
- *Production surveys in sub-sectors:* Overall, the tea sector shows higher awareness on SCP topics than rice and dairy processing sectors. This can be explained by export-driven market of the Sri Lanka tea sector. All three sectors have good awareness on consumer protection/health and cleaner production. Climate change, carbon footprint and associated business opportunities scored lowest on awareness. Certified management systems on food safety, environment, energy, and OH&S have received no or little attention in rice and dairy processing to date. Implementation of certified management system is higher in tea sector because of international requirements, including Rain Forrest Alliance. When factories were asked about their need for policy and sectoral support on SCP, technologies, capacity building, international good practices and green finance were rated as a highest priority. For tea sector, higher identified need for support on green products (e.g. increase demands, support export). Sri Lankan tea sector seems to have favourable performance against international benchmarks. There is a need for further international data to benchmark specific products in Sri Lankan rice and dairy processing sectors. Many companies do not have proper data systems to understand and monitor their SCP performance.
- *National SCP indicators:* The proposed SCP indicators for Sri Lanka can play a key role for monitoring progress towards the countries SCP objectives, monitoring trends in areas of key relevance to SCP, benchmarking with patterns of consumption and production in other countries, and raising awareness of the importance of SCP and to improve accountability. The development and implementation of SCP indicators is not a "one-off" exercise, but rather a process of continuous learning and adaption to evolving SCP priorities and circumstances over time. The success factors for (SCP) indicators should be carefully considered as part of the ongoing efforts on this topic (e.g. reflect a widely recognised concern, data reliability and availability, and SMART[1]).
- *SCP monitoring and targets:* The scope and methods for the SCP indicators and subsequent monitoring depend on evolving policy priorities and existing institutional and inter-ministerial arrangements. A key next step in the SCP indicator process is to discuss and agree on national targets for selected SCP indicators and implement a practical and result-oriented monitoring system (or integrate into existing system(s) where possible).
- *Multi-stakeholder processes:* Follow-up processes on the proposed SCP indicators and subsequent monitoring should be undertaken through multi-stakeholder approaches with relevant public and private sector agencies (e.g. Ministry of National Policies and Economic Affairs, Ministry of Sustainable Development and Wildlife, agencies in dairy, tea and rice processing sub-sectors).
- *Integration of SCP indicators:* Key national and international agreements are closely linked to the proposed national SCP indicators, including the Sustainable Development Goals (SDGs), Nationally Appropriate Mitigation Actions (NAMA) and Intended Nationally Determined Contributions (INDC)). Careful consideration should be given to the integration with these initiatives.
- *Creating ownership:* The SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project assists with scoping, developing and piloting SCP policy instruments customised to the needs of Sri Lanka. Building upon the results from the baseline assessment (e.g. consumer surveys, production surveys in three sub-sectors, national SCP

[1] Specific, Measurable, Attainable, Relevant, Timebound (SMART).

indicators), continued efforts are required to create long-term ownership by relevant institutions and sustain processes and implementation over time.

Recommendations

The key recommendations and next steps from this baseline and awareness assessment are summarised in the table below. The SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project will coordinate further discussions and follow-up from these recommendations.

Table 1: Recommendations and next steps – subject to further stakeholder discussions

Topic	Potential lead (to be confirmed)	Proposed recommendation and next step
Sustainable consumption and consumer awareness	Ministry of Mahaweli Development and Environment Consumer Affairs Authority	Based on the results from the consumer survey presented in this report, undertake targeted communication and awareness raising campaign(s) to improve consumer awareness on sustainable consumption and production, and thereby support behaviour changes towards more sustainable consumption.
	Ministry of National Policies and Economic Affairs	Take into account the top priorities identified by consumers interviewed as part of the survey in national level consumer and SCP related development programs. These top SCP priorities include: • Sustainable and responsible use of natural resources. • Increase education and awareness on environmental and sustainability issues. • Increase water efficiency and reduce water wastage. • Better waste reuse, recycling and disposal. • Improve availability and access to public transport.
	Sri Lanka Standards Institute Consumer Affairs Authority	Investigate opportunities, challenges and implementation pathways to increase visibility, marketing, standardisation, and affordability of available green products in Sri Lanka, and thereby enable consumers in selection of green products
	Department of Census and Statistics Consumer Affairs Authority	Building upon the survey carried as part of this SCP baseline assessment, investigate potential and means to integrate SCP related questions into existing national level consumer surveys
Sustainable production in three sub-sectors (dairy, tea and rice processing)	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Undertake efforts to include more large dairy processing factories in the sustainable production survey to have a more representative sampling of the large factories in the dairy sector.
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Undertake a targeted capacity building and training program for industry sectors on the relevant SCP concepts and associated business opportunities for Sri Lanka businesses. In these capacity building efforts, pay special attention on increasing business awareness on climate change and green products because production surveys undertaken showed that awareness on these two topics is low.
	Ministry of National Policies and Economic Affairs	Investigate means to streamline data collection, management, and reporting amongst Sri Lanka business for better process control, sharing learnings and sectoral monitoring.
	Department of Animal Production and Health Institute of Post-Harvest Technology	Assess opportunities to increase government support towards green technologies transfer for dairy and rice processing industries. These two sub-sectors are currently constrained by outdated and resource-inefficient technologies.

Topic	Potential lead (to be confirmed)	Proposed recommendation and next step
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Further utilise and build upon the database with factory inputs and output data developed with the aim to provide additional services and SCP policy support to dairy, tea and rice processing factories. Opportunities include: • Identification of factories which perform under the benchmarks developed for material use, energy, water and wastes. • Sharing experiences and benchmark performance in the sub-sectors through detailed analysis of factory inputs, outputs and their correlations.
National SCP indicators and monitoring	Ministry of Mahaweli Development and Environment	Coordinate multi-stakeholder process to discuss and agree on national targets for selected SCP indicators and implement a practical and result-oriented monitoring system. • Careful consideration should be given to desired level of integration with key related initiatives such as SDGs, NAMA, and INDC. • Specific attention should be paid to create synergies and partnerships with the Ministry of National Policies and Economic Affairs, Ministry of Sustainable Development and Wildlife, and specialised agencies (e.g. dairy / tea / rice processing, energy, water).
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Continue consultations and find solutions to create long-term ownership with relevant national institutions on SCP indicators, monitoring processes and implementation.
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Consider the delivery of capacity building with relevant national agencies on SCP indicators, focusing on the development and quantification of indicators and implementation of integrated monitoring systems.

1. INTRODUCTION

1.1. National SCP Policy Support Project

SWITCH-Asia Sustainable Consumption and Production National Policy Support Component Sri Lanka (SCP NPSC SL) which was commenced in mid January 2015 is a 4-year, EU funded project awarded upon the request of the Ministry of Mahaweli Development and Environment (MoMDE) as a 'technical assistance programme' to support the strengthening of the overall government policy and institutional framework for implementation of SCP. MoMDE is the main beneficiary of the NPSC project, which also strengthens the role of the Ministry as the national focal point for the implementation of the 10 Year Framework of Programmes on SCP (10YFP).

Sri Lanka has also benefitted from the SWITCH-Asia funding with projects addressing initiatives at the enterprise level in the sectors of food and beverages, tourism and export oriented industries, which benefited over 500 SMEs directly by way of optimised resource utilisation, efficient use of energy and water, and minimising waste generation. However, these Sri Lankan projects, similar to other projects targeting SMEs in the region, identified, at the final stage, the need to strengthen the overall SCP policy and institutional framework in the country to enhance the uptake of such green and sustainable production and consumption practices by wider spectrum of the SMEs. Initial steps in this regard were undertaken in Sri Lanka as a result of launching a voluntary 'Green Reporting' system and with enhanced dialogue with stakeholders on Green Public Procurement.

The overall objective of the SCP NPSC SL is to support the Sri Lankan Government in selecting, adapting and implementing suitable economic and regulatory policy instruments to promote sustainable consumption and production, thereby enhancing the long-term sustainability of consumption and production patterns.

1.2. Rationale for this assignment

The present ambitious development drives of Sri Lanka are rapidly encroaching on the traditional Sri Lankan lifestyles in both urban and rural areas. While urbanisation is spreading along with unsustainable SCP patterns, the aspirations of the market based economic system are changing the consuming and producing behaviour of all citizens. In this backdrop, a baseline study on SCP Awareness in Sri Lanka will be essential towards identifying potential interventions for promoting sustainable consumption and production habits.

To ensure the effective implementation of national SCP related policies, a comprehensive SCP monitoring system with an indicator framework will have to be established based on the suggested indicator set. As a result of tracking the progress on established priorities and targets, indicator based monitoring and reporting is considered to be one of the most effective forms of evaluating the success of SCP progress. Indicators of SCP are inextricably linked to broader sets of indicators on the environment and sustainable development, including poverty reduction. The indicators will provide guidance to policy-makers on the progress towards more sustainable patterns of consumption and production. The monitoring of an SCP programme should be a continuous process and will evolve as better methodologies and data become available. The statistic authorities and relevant ministries will have to be made responsible for monitoring and reporting the national SCP progress towards achieving specific objectives for sustainable development.

In order to achieve the above, it is necessary to conduct baseline studies on existing SP programmes and initiatives in the manufacturing and service sectors. This may direct the on-going initiatives on its range and areas covered, the realization of the expected results, and the current situation of the SP in Sri Lanka in terms of cleaner production technology deployment, energy efficiency improvement, waste management, supply chain management and so on. The baseline will have to be elaborated with the parameters which can be quantified and qualified in the comparison operation with the future development in the sectors, such as the environmental characteristics, economic figures and market drivers, details on how many SP tools are used for how many industries, and the social and environmental impact in terms of the living standards or the pollution emissions generated.

To be able to support an increase in sustainable, eco and resource efficient cleaner production, the demand for cleaner, greener and environmentally friendly and sustainable products, goods and services needs to be increased. This is particularly important for middle-income countries such as Sri Lanka, where the opportunities for greener economic growth are numerous, and national consumption is on the rise.

The key driver for sustainable consumption (SC) is the well-informed and knowledgeable consumer (conscious consumer) who would predominantly seek, purchase and use greener products and services.

1.3. Objectives of baseline and awareness assessment

The specific objectives of this baseline assessment are to:

- Understand the present level of Sustainable Production (SP) and SCP penetration and awareness in selected pilot sub-sectors (dairy, tea and rice processing) of the food and beverages sector in Sri Lanka.
- Understand the present level of Sustainable Consumption (SC) patterns and level of awareness of Sri Lankan consumers.
- Assess the current state of play of the three pilot sub-sectors and national level in Sri Lanka in relation to SCP indicators and monitoring.
- Draw lessons from international reference materials and experiences in the development and implementation of SCP indicators.
- Establish a set of clearly defined and prioritised SCP indicators for the three pilot sub-sectors (dairy, tea and rice processing) and national level.
- Set baseline values for set of prioritised SCP indicators at national and sub-sectoral levels so that future patterns of SCP can be monitored over a period of time.
- Set up a principle framework with national SCP indicators and their baseline values, including references to international benchmarks. Such framework can provide the basis for the establishment of an indicator based national SCP monitoring system to promote effective change towards more SCP practices in Sri Lanka.

1.4. Scope of work and selected pilot sub-sectors

In close cooperation with the Ministry of Mahaweli Development and Environment and under the supervision of the Project Team Leader, the short-term experts have carried out the following tasks to meet the objectives of this study:

- Collect and summarise information on existing SCP related monitoring systems and SCP indicators already used by Ministry of Mahaweli Development and Environment (MoMDE) and other ministries/organisations.
- Review a draft long-list of potential indicators and suggest a set of prioritised SCP indicators for the pilot sub-sectors (dairy, tea and rice processing) and national level.
- Collect and summarise information on international good practices;
- Operationalise SCP indicators and prepare a enhancement plan with a modest, relevant and practical set of indicators.
- Evaluate the current situation and on-going SCP initiatives at national level and pilot sub-sectors, including existing SCP indicators and related monitoring systems in the country.
- Prepare questionnaires and methodology for surveys in three pilot sub-sectors and a national consumer survey.
- Facilitate inception stakeholder workshop (28 April 2016) to validate the draft set of SCP indicators and draft questionnaires developed for pilot sub-sectors and consumers.
- Undertake training session with local consultants (ISB) to undertake the surveys in pilot sub-sectors and with consumers.
- Analyse results from production and consumer surveys undertaken by consultants (ISB).
- Set baseline values of SCP for pilot sub-sectors and national level, and benchmark these values against international values.
- Facilitate stakeholder consultation workshop (27 October 2016) to review and endorse the SCP indicators, baseline values and suggestions on SCP monitoring systems.

- Write up SCP baseline study report (this report.

A consultative workshop was held by SCP NPSC SL project under the patronage of Ministry of Mahaweli Development and Environment to select the most appropriate sector for a pilot study. An organized methodology was used to arrive at a score for many sectors considered important by the participants of the consultative group. Based on the final scores it was decided to select the food and beverages sector for the pilot study. Since the food sector is very broad it was necessary to focus on specific sub-sectors, which are manageable within the project period and the project budget. A similar analysis was carried out for the sub-sectors within the food and beverage sector. Based on the assigned scores dairy, tea, and rice processing were selected for the pilot study.

Figure 1 presents the scope for indicator and baseline setting for three sub-sectors of the food and beverages industry. Products to be covered under each sector and respective resource inputs are broadly mentioned.

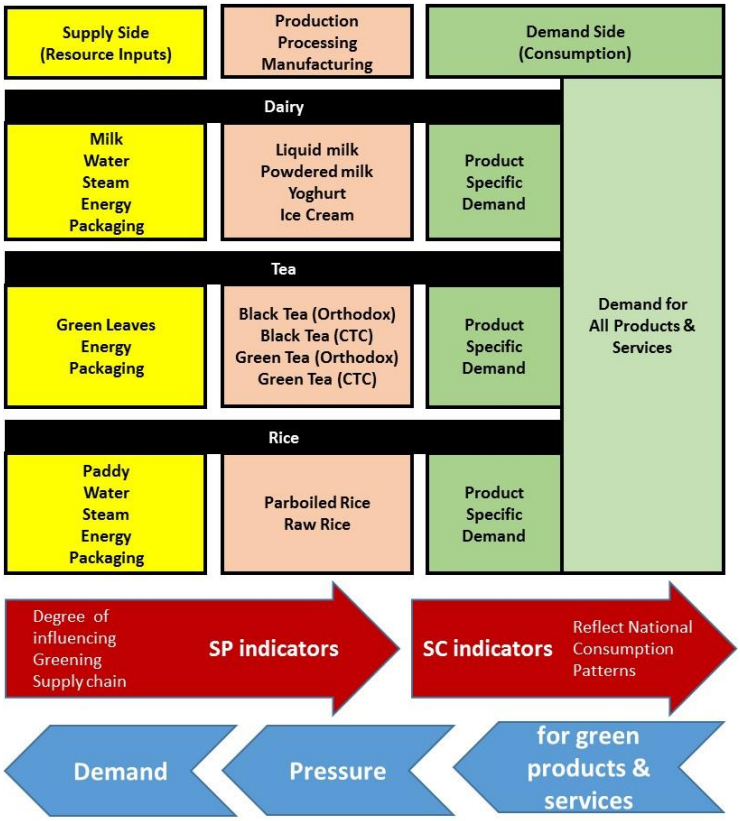

Figure 1: Scope of work and selected pilot sub-sectors

1.5. Structure of this report

This report is structured as follows

- Chapter 1 provides an introduction to the project and baseline assessment.
- Chapter 2 presents a summary of current SCP related policies and initiatives in Sri Lanka.
- Chapter 3 provides an overview of international SCP experiences relevant to this assignment.
- Chapter 4 presents the results from the consumer survey undertaken with 500 people.
- Chapter 5 presents the results from the production survey undertaken in the dairy, tea and rice processing sub-sectors.
- Chapter 6 discusses the work on the development of national SCP indicators, including baseline values and international benchmarking.
- Chapter 7 presents the conclusions and recommendations from this baseline assessment.

1.6. Organisation of the work

This report is prepared by the two experts:

- Dr. Dick van Beers, International SCP Expert.
- Mr. Sena Peiris, National SCP Expert.

in cooperation with:

- Mr. Manikku Leelaratne, Team Leader – SWITCH-Asia SCP NPSC SL.
- Mr. Gamini Senanayake, Key Expert 2 – SWITCH-Asia SCP NPSC SL.

and under the supervision of:

- Mrs. Jeeva Palugaswewa, Senior Environmental Management Officer, Project Coordinator, Ministry of Mahaweli Development and Environment.
- Mr. M.G.W.M.W.T.B. Dissanayake, Additional Secretary (Environmental Planning & Policy), Ministry of Mahaweli Development and Environment.
- Mr.D.C. Siribaddana, Director (Environmental Planning and Economics), Ministry of Mahaweli Development and Environment.

2. CURRENT SCP RELATED POLICIES AND INITIATIVES IN SRI LANKA

2.1. National initiatives

2.1.1. Existing SCP policy landscape in Sri Lanka

Sri Lanka has more than 80 national policies which have a direct or indirect relationship to SCP. Among them the national cleaner production policy of 2007 and subsequent sectoral cleaner production policies for tourism, health, fisheries, agriculture and plantation sectors have a direct relationship to SCP. In addition, national environment policy of 2003, national forestry policy of 1995 and several other policies have a direct relationship though they do not use the word SCP in any of the policies. All these policies are still in force.

There are several initiatives which further strengthen the SCP related work in the country. The establishment of the National Council for Sustainable Development (NCSD) under the chairmanship of the President with all ministries having a relevance to SCP are members of this high-level council is a major initiative for implementation of SCP in the country. The development of an environmental action program for Greening Sri Lanka (Haritha Lanka) under the NCSD, with ten key missions identified under the action plan which is aligned closely with the SDGs in general and Goal 12 in particular. In 2015 a new ministry was established as 'Ministry of Wildlife and Sustainable Development' which is responsible for implementation of Sustainable Development Goals. Therefore, a major responsibility will be taken by them in fulfilling goal 12 on SCP. Ministry of Wildlife and Sustainable Development is in the process of drafting a program for implementation of SDGs including goal 12 in the country.

Sri Lanka is a signatory to most of the multilateral environmental agreements including Paris Agreement, which has provided the motivation for implementation of many of programs related to SCP.

The ongoing Energy Efficiency Improvement and Renewable Energy Promotion initiated by the Government through Sri Lanka Sustainable Energy Authority for both the industries and households has given a tremendous boost to the SCP practices of the country. The development of a Green Procurement Policy and the sustainability reporting initiative by the Ministry of Mahaweli Development and Environment as well as National Green Awards Program by Central Environmental Authority are other major initiatives by the public sector. The continuous operations of national cleaner production centre (NCPCSL) as a non- profit private institute has ensured the application of SCP principles in the business sector. NCPCSL hosted the 1st and 2nd Sri Lanka roundtables on SCP in 2007 and 2013 with financial assistance from Embassy of Norway and UNIDO and a regional roundtable on SCP (9th Asia Pacific Roundtable on Sustainable Consumption and Production-APRSCP 09) in 2010 creating a new dimension to awareness on SCP in the country. The establishment of Life Cycle Analysis and design for Sustainability network (LCADeS.net) has created a new level of awareness to promote Life cycle management among business and academics. The initiation of the project on eco-innovation under UNEP funding is another noteworthy initiative in the country which strengthens the SCP practices in the country.

Sri Lanka has implemented several Switch Asia projects on SCP during the past few years[2]. A project for the food and beverage sector providing technical and capacity building assistance to 500 SMEs on SCP, Greening Sri Lanka hotels providing assistance on SCP implementation to 350 Sri Lankan hotels were successfully completed while the project on improving bio gas technology through the project "Promoting Renewable Energy as a Driver for Sustainable Development and Mitigation of Climate Change in Sri Lanka" is currently in progress.

Availability of finance is a key requirement for the implementation of most SCP actions in the business sector. There had been three major financial assistance projects namely, Pollution Control and Abatement Finance loan scheme (PCAF), E-Friends loan scheme, Prevention of Environment Pollution (PEP) grant scheme implemented by Ceylon Chambers of Commerce (CCC) with financial assistance from Government of Netherlands. Currently, an E-friends revolving fund loan scheme for environmental projects in industry is implemented by the National Development Bank (NDB) through the accumulated payments from E-friends loan recipients. In addition, Sri Lanka Climate Fund is in operation providing finances to climate change related projects. The National Science Foundation (NSF) provides a research grant scheme including environment related projects.

2 www.switch-asia.eu/projects/

Additionally, several large business enterprises have gone beyond compliance and have initiated SCP initiatives within their businesses responding to the global pressures for SCP by their customers.

2.1.2. Existing SCP related indicators and monitoring schemes in Sri Lanka

Reporting of performance of economic sectors in Sri Lanka is done by two major sources; Central Bank, through the annual central bank report and Department of Census and Statistics through their regular survey results including the Household Income and Expenditure Survey (HIS). To obtain data for their annual reports, surveys are carried out by department of census and statistics. Central bank collects most of the information from ministries and institutions as well as from department of census and statistics.

There is no dedicated institution to gather data for measuring sustainable consumption and production in the country but some of the indicators given in the central bank report and reports of department of census and statistics are directly related to SCP. In addition, there are many other ministries and national institutions who develop many other performance indicators. A study has revealed that over 300 indicators generated by various ministries and institutions are related to SCP.

Sri Lanka Sustainable Energy Authority (SLSEA) under Ministry of Power and Renewable Energy is the main institution which monitors and collects data for reporting energy performance at national level and sector level. The SLSEA collects data from all relevant public and private organizations and develop 'annual energy balance' which provides the key performance indicators for the energy sector. The Department of Labour, under the ministry of Labour and Trade Union Relations, is responsible for monitoring the employment related matters and collecting data for industrial accidents and welfare of industry personnel. Climate change secretariat under the Ministry of Mahaweli Development and Environment monitors all carbon emission and management issues in the country, collects and publicizes the indicators in their 'National communication of GHG emissions' to UNFCCC. However, there is no regular monitoring scheme for GHG emissions annually by the secretariat.

Further, there are indicators developed and published by Agriculture, Livestock, Fisheries, Water, Land use, Biodiversity, Waste, Transport, Telecommunications, Mining and other sectors through the annual reports of all the relevant ministries and institutions. These annual reports are the sources for many international reports on Sri Lanka performance. The units of the reported indicators vary according to the preferences of the originator of the indicator as there is no regular unit recommended for the indicators.

There is no unified monitoring system and reporting mechanism for SCP indicators in the country. Since the issues under SCP are diverse there is no single entity responsible for monitoring and reporting of the SCP indicators. Indicators are developed and monitored by individual ministries and relevant institutions to report their internal performance instead of national performance.

A research carried out on challenges of implementation of SCP indicators by a student of University of Colombo for her master's studies (report to be published soon) reveals the challenges for the implementation of SCP indicators in Sri Lanka. Among them frequent changes of officers, data unavailability and accuracy, technology, communication, coordination among departments, financial allocations are rated to be key challenges. A major overarching challenge for implementation of monitoring and reporting of SCP indicators is the lack of ownership of such a streamlined indictors framework.

In the future reporting of 17 SDGs and their 169 targets through the indicators is going to be a major responsibility of the Ministry of Sustainable Development and Wildlife. Probably, the ministry will develop a framework for monitoring and reporting progress of SDG indicators in the future. Ministry of Mahaweli Development and Environment may function as the coordinator for monitoring and reporting of SCP performance under SDG goal 12.

2.1.3. Sustainable Development Goals (SDGs)

Sri Lanka is a signatory to the implementation of Sustainable Development Goals from 2016 to 2030 and commitment made at the highest level of the government to fulfil the obligations under the SDGs.

A separate ministry is established as 'Ministry of Sustainable Development and Wildlife' whose mandate is to effectively implement SDGs. The ministry made arrangements to establish a SDG Secretariat and develop a plan of action for implementation of 17 SDGs and the 169 targets. Currently they are in the process of identifying different ministries and institutions to be engaged for implementation of SDGs and subsequently the plans will be developed.

The initiative under Ministry of Mahaweli Development and Environment for the promotion of SCP falls under SDG goal no 12- Sustainable Consumption and Production. The baseline study has identified linkage of all 17 SDGs to SCP and the SCP indicators developed under this study as shown in the subsequent chapters.

2.1.4. Consumer initiatives

Consumers in Sri Lanka are diverse in their preferences and behaviour for consuming resources. In the past, the consumers were considered to be price sensitive, but the trend had been that majority were looking at the quality of products also when purchasing products. According to the Consumer Affairs Authority, men in Sri Lanka are more conscious about the brand when purchasing products while women were more brands conscious when they purchased foods and beverages for their households.

The ending of civil war and the economic development in the last few years has brought economic prosperity in the country making significant changes in the lifestyles of the people. The urbanisation has brought in a change of food consumption patterns resulting in a 'nutrition transition'. People in the urban areas particularly are bent towards having fast foods even though there are convenient nutritious and cheaper foods are available in the market. Further rapid growth of multiple communication channels, for access to information and frequent commercial advertisements has heavily influenced the consumer patterns

In addition to the consumer protection work, the Consumer Affairs Authority is involved in several awareness creations on the promotion of local foods around the country through school level programs and island wide consumer organizations. The Consumer Affairs Authority further celebrates annual consumer rights day by having appropriate themes for each year to ensure consumer wellbeing.

It is seen that future consumption patterns will be highly dependent on many emerging trends such as higher literacy rates, aging population, increasing employment rates, and increasing demands for organic products.

2.2. Dairy processing

Milk is considered a major nutrient requirement for people of all age groups but especially children and infants. Sri Lanka depends on imports for meeting its milk demands though successive governments have made several attempts to enhance the milk production in the country.

While there are a few major companies dominating the milk supplies through imports and local production, there are more than 7,000 micro, small and medium enterprises (SMEs) supplying various milk products to the local market.

According to statistics from the Department of Animal Production and Health, Sri Lanka has a cattle population of 1,118,089 and buffalo population of 375,562. The total milk production in the country is only 419 million liters, with an annual growth rate of 9.8%. The per capita milk consumption is estimated to be 45.6 l/year or 124.9 ml/day. Therefore, Sri Lanka imports 528.8 Million liters of milk which is 55% of the country total consumption.

The highest milk producing district is Nuwara Eliya with a total production of 73 million liters and an average per head production of 15.1 l/milking cow while the country average is 2.0 liters per cow.

Sri Lanka exports a small amount of condensed milk which was 3.3 million liters in 2014.

The main dairy products produced by micro, small and medium sized enterprises include yoghurt, curd, ice cream and ghee. The large dairy processing companies produce drinking milk, butter, cheese as well as yoghurt, curd and ice cream. For example, the total curd production in Sri Lanka in 2015 was 23,056,708 liters where the curd production by large factories was only 1,584,381 liters.

According to the Department of Animal Production and Health, the following SCP initiatives are currently being implemented in the dairy sector:

- Improve per animal production.
- Introduction of waste disposal systems.
- Minimise land degradation by promoting intensive farming.
- Promotion of commercial fodder production for resource optimization (e.g. grass).
- Minimise antibiotic usage.

- Bio security improved at processing plants.

2.3. Tea processing

Sri Lanka tea industry has a long history dating back to 1867. The tea industry has grown rapidly and today Sri Lanka has become a major tea supplier to the world. Tea is considered the most popular natural beverage which is second only to water.

The total extent of land covered by tea sector is around 203,020 hectares under low, medium and high grown categories. In 2015 Sri Lanka produced 32.8 million kilograms of tea. The average export earnings from tea amounts to 1,500 million US Dollars. The tea sector provides direct and indirect employment to more than 1 million persons in Sri Lanka[3].

Sri Lanka has about 656 tea processing factories producing orthodox tea, CTC teas (Cut, Twist and Curl) and green tea. Around 90% of factories produce orthodox black tea using rollers and rotor vane technologies. Balance is CTC and green teas.

The main factors contributing to producing high quality tea are the quality of the tea leaves, the quick delivery to the factories and efficient processing techniques. The tea industry is a dry industry where water is not used for processing. Energy consumption in the tea sector is considered high, and therefore SLSEA has developed national energy benchmarks for the tea sector.

Indicators used to evaluate the energy efficiency in tea industry are:

- Specific Electricity Consumption (SEC) i.e. electrical energy (kWh) to produce one kilogram of made tea.
- Specific Firewood Consumption (SFC) i.e. quantity of firewood in kilograms to produce one kilogram of made tea.

Therefore, estimated values for the above two indicators are:

- SEC between 0.7 – 1.1 kWh/kg of made tea.
- SFC between 1.0 – 2.0 kg firewood/kg of made tea.

The benchmarks for the tea industry is fixed as SEC = 0.78 kWh/kg of made tea for high and medium grown tea and 0.82 kWh/kg of made tea for low grown teas while SFC is fixed as SFC = 35.2 MJ/kg of made tea for high and medium grown teas and 34.9 MJ/kg for low grown teas.

During the workshop held on 27 October 2015,' it was stated that the Tea Research Institute has embarked on accelerated Research and Development projects satisfying stakeholder requirements, towards SCP in providing technological solutions in the following areas.

- Automatic control system for trough withering with a view to reducing electrical energy consumption by about 0.18 kWh/kg of Made Tea (MT).
- Automatic control system for tea drying (FBDs).
- Alternative Energy Sources for tea processing.
- Testing / developing new tea machinery /machinery components which are energy efficient.
- Conducting energy audits in collaboration with SLSEA & educate stakeholders for efficient energy management.

Further, the sector has identified the following needs in technological and capacity building in tea industry for SCP promotion[4]:

- Improving good standard of leaves in plucking thereby reducing the percentage of refuse tea and increasing main grade percentage.
- Improving the factory worker productivity by choosing correct capacity of machinery.

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[3] Sri Lanka Tea Board. 2012 Annual Report.

[4] Based on presentation by K. W S Botheju and L S K Hettiarachchi, Tea Research Institute of Sri Lanka. Tea Sector Overview. Stakeholder Consultation Workshop, Colombo, 28 April 2016.

- Energy security for tea industry.
- The latest air heating equipment such as hot water generators, five pass heat exchangers can also be introduced to the industry to improve thermal efficiency, and thereby efficiency can be increased by about 60%.

2.4. Rice processing

Paddy cultivation in Sri Lanka is centuries old and is widespread across the entire country with more than 40% of the total country work force engaged in the sector. Sri Lanka produce about 4 Million metric tons of paddy annually both in 'yala' and 'maha' seasons.

Sri Lanka has more than 7,500 rice processing mills which are divided into custom mills and commercial mills. Sri Lanka has about 65% custom mills which process about 60% of the paddy produced. The remaining mills are categorised as commercial mills which process about 40% of the total annual production of paddy.

These commercial mills can be divided into three major categories as small mills, medium sized mills and large mills. A mill which processes less than 4 metric tons a day is categorized as a small mill, while a mill with a capacity of more than 8 metric tons a day is categorized as large mill. The mills having a capacity between 4 to 8 tons is considered as a medium sized mill.

In the southern part of the country paddy is processed into raw rice while rest of the country all the mills produce par boiled rice. There is a major difference in the processing where par boiled rice requires a large amount of water and contribute to large volumes of wastewater from these operations.

In the recent past, a large number of small mills stopped their operations because they are unable to compete with the large rice processing mills. The major factors are the required infrastructure and associated investment costs of the storage of paddy and processed rice. Most of the medium rice mills still use old technology and unskilled personnel while large mills have opted for modern technologies and skilled labour for their operations. The scaling up of the rice processing leads to many positive impacts (e.g. economic of scale, increase production efficiency) and negative impacts (e.g. investments costs, high water demands).

The former Director of the Institute of Post-Harvest Technology (IPHT) highlighted during the validation workshop held on 28 April 2016 (See Appendix 4) that the following key actions as future prospects of the rice processing industry.

- Improve productivity through fully mechanization (No Hand Touch).
- Improve rice quality up to international standard of special rice varieties suitable for international market.
- Produce organic and traditional rice for niche market.
- Diversification of rice based products including by products.
- Dust free- green technologies.

Paddy cultivation and rice processing continue to be sub-sectors with increasing economic importance in Sri Lanka for the foreseeable future. Hence, the development of the rice processing industry to a more technology advanced stage will be of key importance to its competitiveness.

3. INTERNATIONAL SCP LEARNINGS AND EXPERIENCES

3.1. Importance and role of SCP indicators[5]

Governments in all countries use indicators for a number of purposes and in various policy areas. Indicators convey information about the current situation using a format that is easy to understand. Out of the large pool of statistics and other kinds of data that exist in each country, indicators represent selected pieces of information that are chosen because they highlight areas of key importance for policy making. Indicators can be used both internally by government agencies and for communication with citizens, private enterprises and other actors. In most cases, indicators are quantitative measures derived from national statistics or are based on surveys. SCP indicators will mainly be used for:

- Monitoring progress towards a SCP objective.
- Monitoring trends in areas of key relevance to SCP.
- Benchmarking with patterns of consumption and production in other countries.
- Raising awareness of the importance of SCP and to improve accountability.

The policy cycle can be structured into four main phases: problem identification, policy formulation, policy implementation and monitoring and evaluation. At each of these stages there is a need for reliable data reflecting the situation in a country and a role for (SCP) indicators (see figure below).

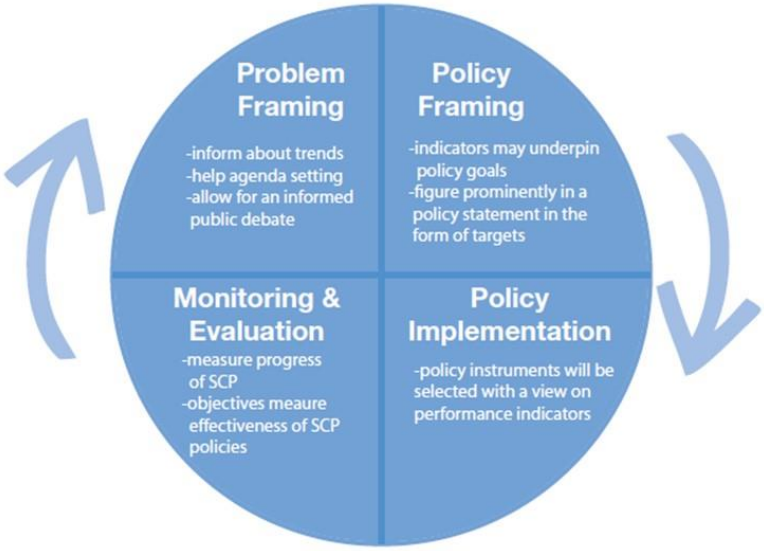


Figure 2: The role of (SCP) indicators throughout the policy cycle

3.2. Developing SCP indicators

For governments, the process of identifying indicators can help with mainstreaming SCP. The process can help government bodies in charge of different policy domains to form a shared vision on the meaning and objectives of SCP. It can thereby contribute to improved policy coherence. In addition, involvement in the process of indicator development builds ownership and responsibility. Since SCP is a very broad policy field that spans across administrative divisions and needs to involve several line ministries or other governmental bodies, the coordinating/mainstreaming value of such processes can be significant.

In order for indicators to be fully effective, the involvement of civil society, the business community and academia is desirable. Governments cannot make SCP happen on their own. One consequence of this need for active contributions from other actors is that the selection and design of SCP indicators needs to reflect the interest and priorities of other groups in society. Only if the indicators represent a widely held understanding of SCP and related priority areas can they become fully effective as a coordination mechanism and a guiding tool.

[5] Extracted from: UNEP (2015). Sustainable Consumption and Production: A Handbook for Policymakers.

3.3. Structure data and identify indicators that reflect critical aspects[6]

There is a large pool of environmental and sustainability indicators available today that may be employed for analysing SCP performance. UNEP has developed an approach for SCP indicators outlined in the publication SCP Indicators for Developing Countries: A Guidance Framework. It aims to provide guidance to government departments for selecting their national SCP indicator sets. The framework is based on the notion of the following five capitals.

- Natural capital.
- Manufactured capital.
- Financial capital.
- Social capital.
- Human capital.

These capitals are related but not fully substitutable. In essence, for SCP to be successful in a country, natural capital should not decrease below a threshold of critical natural capital. The framework identifies 4 important aspects for developing measurable SCP objectives and related indicators. They include the critical natural capital approach and the efficiency based approach as well as compliance and connectivity. According to the UNEP guidance framework, indicators need to provide information that may guide changing behaviours of producers and consumers. They suggest that in addition to a set of macroeconomic indicators relating to the SCP performance in a country, it would be important to also develop indicators that reflect the activities of individual consumers and producers in terms of the four perspectives.

Figure 3: A SCP compass

Any national (and sectoral) SCP indicator system will need to provide a set of headline indicators along with some more detailed indicators and would profit from indicator dashboards, i.e. sets of indicators that taken together provide information on key aspects of a system. Looking at the indicators together, as a set, should provide an understanding that goes beyond the information conveyed by each individual indicator.

Criteria for quality SCP indicators:

- Easy to understand and communicate also to non-experts.
- Reflect a widely recognised concern.
- Based on conceptually sound calculation methodologies.

[6] Extracted from: UNEP (2015). Sustainable Consumption and Production: A Handbook for Policymakers.

- Encourage systemic transition/transformation/innovation.
- Based on available or easily obtainable data.
- Based on reliable data.
- Based on data that is updated regularly.
- Possible to construct time-series to observe trends.
- Sensitive enough to detect changes over the short or mid-term, should provide a reasonably up-to-date picture of the situation.
- Be SMART (Specific, Measurable, Attainable, Relevant and Timebound).

When taken together as a whole, the SCP indicator sets should cover all critical aspects of SCP and provide decision makers with an adequate understanding of whether or not the country is on the right track to achieving SCP. Furthermore, a good set of indicators should consist of a limited number of quality indicators as too many, or weakly structured indicators can easily create confusion.

3.4. Working with indicators in practice[7]

When working with indicators in practice there are a number of things to keep in mind. The following points provide general advice on how to avoid common mistakes and pitfalls.

- Seek to get the indicator set approved at the highest political level. Endorsement from the political level gives indicators extra weight and makes it easier to engage all governmental agencies.
- Allocate clearly the responsibility for regular follow-up and reporting. For each indicator, or for the whole indicator set, there needs to be an institution with coordinating responsibility. Changes in indicator values need to be clearly documented and communicated to relevant government agencies as well as to other actor groups, sometimes also including the general public. In cases where progress is weak, it is necessary to agree which part of the government is in charge of taking remedial action. If an indicator is not based on information generated by the regular statistics system, it may be necessary to develop new routines for data collection and reporting.
- Be flexible and prepared to revise. Working with indicators is and should be a learning process. There is value in observing the same indicators over several years, but there is also a need to review and revise indicator frameworks once in a while to properly reflect emerging issues and new priorities. Hence it is important to strike a balance between continuity and renewal. If the reporting of indicators is done annually it may be a good idea to have a more thorough review every five years.
- Analyse trends and seek to understand why changes are happening. This requires adequate resources in terms of staff and skills. Without proper analysis and understanding there is a risk for ineffective or counterproductive policy response. Indicators only tell part of the truth – that is the reason why they are useful, they simplify a very complex reality into a few metrics that can be understood at a glance. However, this is also one of the dangers of indicators: that they highlight certain aspects but ignore others. This underscores the need for regular reviews to make sure that the indicators used reflect current priorities.
- Communicate achievements widely. Use indicators for education, awareness raising and to improve accountability.
- Learn from other countries' experiences and share lessons learnt with others. Collaborate in international networks and platforms.

3.5. International examples of SCP Indicators

The Guidance Framework on SCP Indicators for Developing Countries (UNEP, 2008) includes a comprehensive set of existing SCP-related indicators from a range of countries. As an illustrative example, the indicator set for Malaysia is provided in the figure below.

[7] Extracted from: UNEP (2015). Sustainable Consumption and Production: A Handbook for Policymakers.

SCP-related Indicators	Indicator Set	Core Indicators
Material Consumption & Resource Use		
Water Use per 1000 people	JPBD-F	•
Extent of Fertiliser and Pesticides Use per Unit Amount of Produce	Lestari	•
Total Landings of Marine Fish	SPI indicators	
Energy Use		
Renewable Energy vs. Total Energy Use	Lestari	•
Land Use and Biodiversity		
Totally Protected Area vs. Total Forest Area vs. Total Land Area	Lestari	•
% Agricultural Land for Food Production vs. Total land area	Lestari	
Waste and Pollution		
Total Solid Waste	JPBD-F	•
Total Solid Waste Recycled	JPBD-F	•
No. of Crows (Unmanaged Waste)	SPI indicators	
pH Value of Rainfall (Acid Rain)	SPI indicators	
Trends in Emission of Greenhouse Gases	Lestari	•
SOx and NOx Emission Intensities	Lestari	
Air Pollution Index	SPI indicators	•
Water Quality Index (River Water Quality)	SPI indicators	•
Equivalent-A-weighted sound level (Environmental Noise)	SPI indicators	
Socio-Economic		
Unemployment rate	JPBD-F	•
Gini coefficient	Lestari	•
Population growth rate	JPBD-F	•
Proportion of population with tertiary education	JPBD-F	
Institutional		
No of Companies Certified MS ISO 14 001	SPI indicators	•
Expenses on Environmental Improvements vs. Annual Budget	Lestari	•
Others		
Percent of public transport users at peak hours	JPBD-F	

Direct Indicator Indirect Indicator

Figure 4: SCP indicators for Malaysia (UNEP, 2008)

Thailand

The Kingdom of Thailand recently developed an SCP indicator set. The indicators used in this system are as follows:

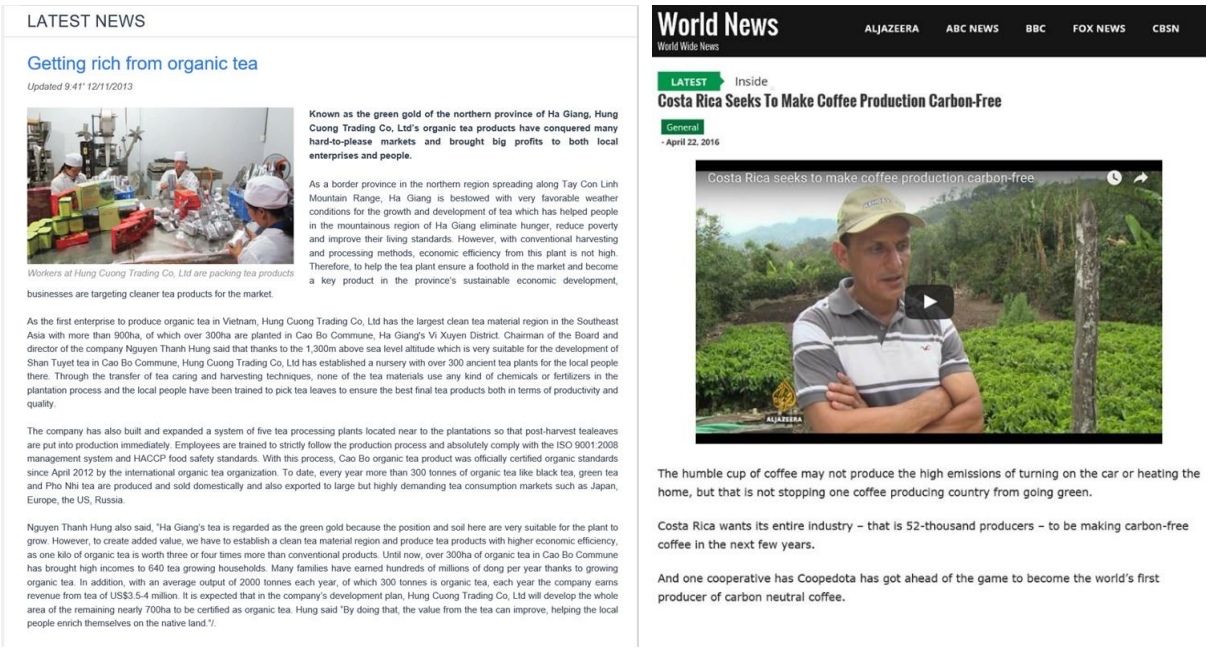
1. Increasing percentage of green procurement per annual budget of government organisations.
2. Improvement of the financial system for environmental management.
3. Increasing numbers of farms that meet standard (environmental).
4. Area of sustainable agriculture increased by at least 5% per year of total agricultural area.
5. Increasing number of factory and business enterprises that meet the Green Industry Standard.
6. Increasing products and services that received the green labels and other green certificates.
7. Increasing numbers of products and services on green tourism.
8. Increasing percentage of public transport.
9. Increasing percentage of use of renewable energy per non-renewable energy.
10. Decreasing national energy elasticity (decrease use of energy per gross production).

3.6. SCP in pilot sub-sectors

The market opportunities for green business are clearly on the rise (UNEP, 2013)[8]. The global market in low-carbon and energy efficient technologies, which include renewable energy supply products, is projected to nearly triple to US$ 2.2 trillion by 2020. Many suppliers are rendering their practices more sustainable in order to secure their positions within international supply chains. This is illustrated for example by the 1,500 per cent increase in global ISO 14001 certifications on environmental management awarded between 1999 and 2009. The global market for organic food and beverages grew to US$ 105 billion in 2015, from the total value of US$ 62.9 billion in 2011. These developments are

[8] UNEP (2013). Green Economy and Trade – Trends, Challenges and Opportunities. United Nations Environment Programme.

supported by two new articles in Figure 5 on organic tea in Viet Nam and carbon free coffee supply chain in Costa Rica.



LATEST NEWS

Getting rich from organic tea

Updated 9:41' 12/11/2013

Known as the green gold of the northern province of Ha Giang, Hung Cuong Trading Co, Ltd's organic tea products have conquered many hard-to-please markets and brought big profits to both local enterprises and people.

As a border province in the northern region spreading along Tay Con Linh Mountain Range, Ha Giang is bestowed with very favorable weather conditions for the growth and development of tea which has helped people in the mountainous region of Ha Giang eliminate hunger, reduce poverty and improve their living standards. However, with conventional harvesting and processing methods, economic efficiency from this plant is not high. Therefore, to help the tea plant ensure a foothold in the market and become a key product in the province's sustainable economic development, businesses are targeting cleaner tea products for the market.

Workers at Hung Cuong Trading Co, Ltd are packing tea products

As the first enterprise to produce organic tea in Vietnam, Hung Cuong Trading Co, Ltd has the largest clean tea material region in the Southeast Asia with more than 900ha, of which over 300ha are planted in Cao Bo Commune, Ha Giang's Vi Xuyen District. Chairman of the Board and director of the company Nguyen Thanh Hung said that thanks to the 1,300m above sea level altitude which is very suitable for the development of Shan Tuyet tea in Cao Bo Commune, Hung Cuong Trading Co, Ltd has established a nursery with over 300 ancient tea plants for the local people there. Through the transfer of tea caring and harvesting techniques, none of the tea materials use any kind of chemicals or fertilizers in the plantation process and the local people have been trained to pick tea leaves to ensure the best final tea products both in terms of productivity and quality.

The company has also built and expanded a system of five tea processing plants located near to the plantations so that post-harvest tealeaves are put into production immediately. Employees are trained to strictly follow the production process and absolutely comply with the ISO 9001:2008 management system and HACCP food safety standards. With this process, Cao Bo organic tea product was officially certified organic standards since April 2012 by the international organic tea organization. To date, every year more than 300 tonnes of organic tea like black tea, green tea and Pho Nhi tea are produced and sold domestically and also exported to large but highly demanding tea consumption markets such as Japan, Europe, the US, Russia.

Nguyen Thanh Hung also said, "Ha Giang's tea is regarded as the green gold because the position and soil here are very suitable for the plant to grow. However, to create added value, we have to establish a clean tea material region and produce tea products with higher economic efficiency, as one kilo of organic tea is worth three or four times more than conventional products. Until now, over 300ha of organic tea in Cao Bo Commune has brought high incomes to 640 tea growing households. Many families have earned hundreds of millions of dong per year thanks to growing organic tea. In addition, with an average output of 2000 tonnes each year, of which 300 tonnes is organic tea, each year the company earns revenue from tea of US$3.5-4 million. It is expected that in the company's development plan, Hung Cuong Trading Co, Ltd will develop the whole area of the remaining nearly 700ha to be certified as organic tea. Hung said "By doing that, the value from the tea can improve, helping the local people enrich themselves on the native land."/.

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LATEST Inside

Costa Rica Seeks To Make Coffee Production Carbon-Free

General

- April 22, 2016

Costa Rica seeks to make coffee production carbon-free

The humble cup of coffee may not produce the high emissions of turning on the car or heating the home, but that is not stopping one coffee producing country from going green.

Costa Rica wants its entire industry – that is 52-thousand producers – to be making carbon-free coffee in the next few years.

And one cooperative has Coopedota has got ahead of the game to become the world's first producer of carbon neutral coffee.

Figure 5: Emerging international market developments in selected pilot sectors

A significant amount of international SCP related experiences and developments are in the three selected pilot sub-sectors (dairy, tea and rice processing). Rather than attempting to capture all key initiatives in this report, references and web links are provided to selected resources in the table below where detailed information on topics of interest can be found.

Further it is noted that a wealth of information is available from the website of the SWITCH Asia Programme on Sustainable Consumption and Production (www.switch-asia.eu), including topic studies and experiences from over 50 EU funded grant projects in the following areas:

- Business and products for the poor.
- Cleaner production.
- Corporate Social Responsibility.
- Creating demand for better products.
- Eco labels.
- Environmental management systems.
- Industrial symbiosis.
- Product design for sustainability.
- Sustainable supply chain management.
- Waste management.

Table 2: Useful international guidance documents relevant to selected sub-sectors

Dairy processing	
	Water use: Envirowise (2007). Benchmarking Water Use in Dairies. Dairy UK. www.wrap.org.uk/sites/files/wrap/EN740_final.pdf
	Cleaner production: UNEP & Danish EPA (2000). Cleaner Production Assessment in Dairy Processing. www.unep.fr/shared/publications/pdf/2480-CpDairy.pdf

	Best Available Techniques: Irish EPA (2008). BAT Guidance Note on Best Available Techniques for the Dairy Processing Sector. www.epa.ie/pubs/advice/bat/BAT%20Guidance%20Note%20for%20Dairy%20Sector.pdf
Tea processing	
	Technology and policy study, including tea sector: Asian Regional Research Programme in Energy, Environment and Climate (ARRPEEC). Small and Medium Scale Industries (SMIs) in Asia: A Study of Selected Technologies and Policy Options - Summary. unfccc.int/cop8/se/se_pres/aite_se_cop8.pps
	Sector study on environment and energy: Asian Institute of Technology (2002). Tea Sector Study. http://faculty.ait.ac.th/visu/public/uploads/books/SMSIAEETS.pdf
	Sustainability: SOMO (2008). Sustainability Issues in the Tea Sector - A Comparative Analysis of Six Leading Producing Countries. www.somo.nl/publications-en/Publication_2548
Rice processing	
	Platform: Sustainable Rice Platform www.sustainablerice.org
	Sustainable production: UNIDO (2014). Resource Efficient and Cleaner Production for Sustainable Rice Milling in Cambodia. http://prospernet.ias.unu.edu/wp-content/uploads/2012/09/SPC-learning-case-10_final.pdf
	Energy efficiency: UNIDO & GEF (2012). Industrial Energy Efficiency Cambodia. Sector: Rice Milling. www.eria.org/events/2.%20Dr.Permod%20Gupta%20-%20Role%20of%20UNIDO%20and%20Its%20Activities.pdf
	Water efficiency: Andhra Pradesh Pollution Control Board (2005). Waste Minimisation In Parboiled Rice Mill Units. www.appcb.ap.nic.in/cpc/Bulletin_123_Parboiled_final.pdf

4. RESULTS CONSUMER SURVEY

4.1. Introduction

The objective of the consumer survey undertaken as part of the baseline assessment is to understand the present level of consumption patterns and sustainability awareness of Sri Lankan consumers and collect data to support the baseline assessment. The survey was undertaken through ISB Consultants through interviews with a sample of 500 consumers using a customised questionnaire. The draft questionnaire and survey sampling was discussed in stakeholder inception workshop on 28 April 2016 (Appendix 4), and the results of the surveys were presented and discussed in validation workshop on 27 October 2016 (Appendix 5).

The survey covered the following topics:

- Consumer awareness.
- Behaviour change.
- Factors influencing purchases.
- Sustainable consumption and production priorities.

Further details on the consumer survey undertaken are included in Appendix 2 of this report, including the questionnaire and sampling. Key results from the survey are presented in the following sections.

4.2. Key findings

Consumer awareness:

- Overall, about half of consumers have no or low awareness on SCP related issues.
- Awareness to reduce wasteful consumption is highest while awareness on available green products is lowest.
- There seems little difference in SCP awareness amongst consumers in urban, peri-urban, and rural areas. There is also little difference in awareness between different age groups.
- People with higher education have higher SCP awareness, and so have people working in the public sector.

Behaviour change:

- A large proportion of the people interviewed (83%) responded that adequate public transport is available in their respective living areas.
- People in lower income group use more public transport, while people with higher income use less public transport.
- People employed in the private sector use most public transport while people in government sector use significantly less.
- People with higher income and higher education have overall higher awareness, and willing to pay a higher price for green products.
- Low income groups are reluctant to pay extra for green products, as expected of course.
- People between 21 and 40 years old are willing to pay a higher price for green products, while people over 60 years old are less inclined to do so.

Factors influencing purchases:

- Most of the purchases seem to be based on price, quality and expiry date.
- Less attention seems to be paid to health or environmental issues in consumer purchasing decisions.

SCP priorities for consumers:

- Responsible use/reduce/disposal of materials, waste, and water ranked as highest priorities to be addressed.

- Energy efficiency, green products, and people's lifestyles were not in top three priorities to be addressed.

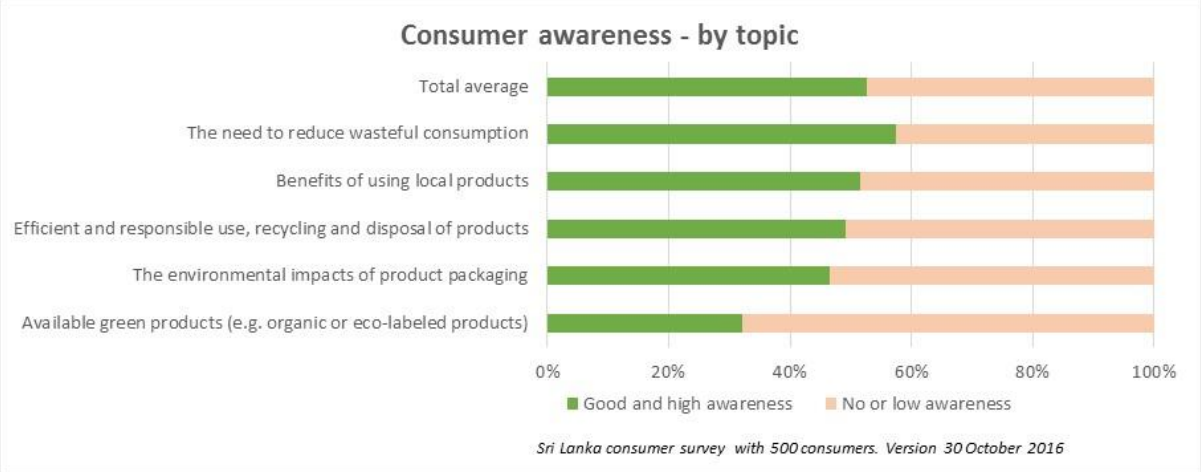
4.3. Consumer awareness

All awareness topics covered by survey

Survey question: How would you rate your awareness on the following issues related to consumer products (e.g. food, clothing, household electronics)?

Possible answers:

- Not aware at all.
- Some but low awareness.
- Good awareness.
- High awareness.

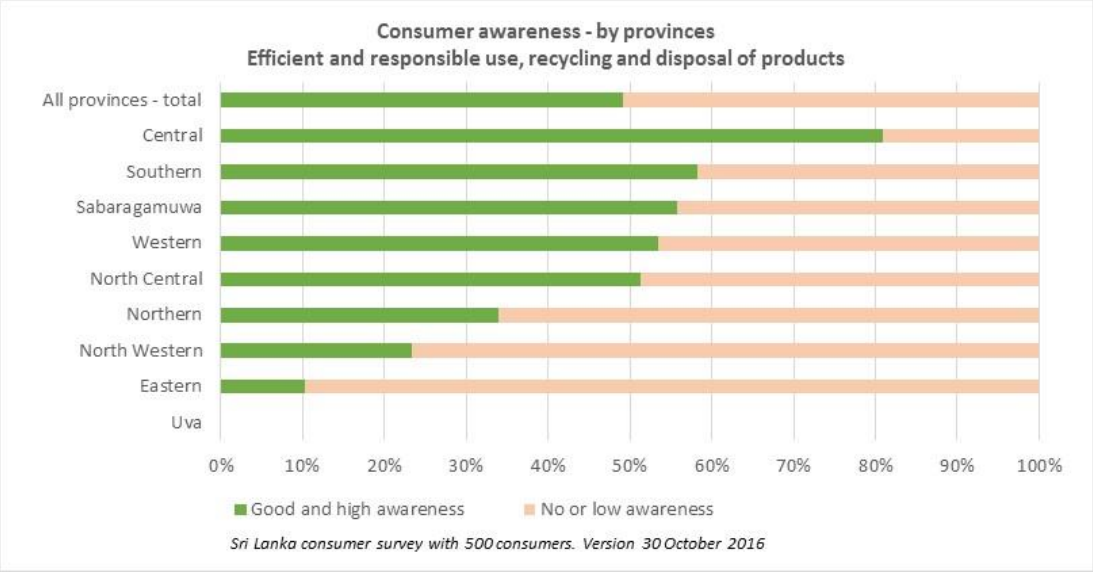


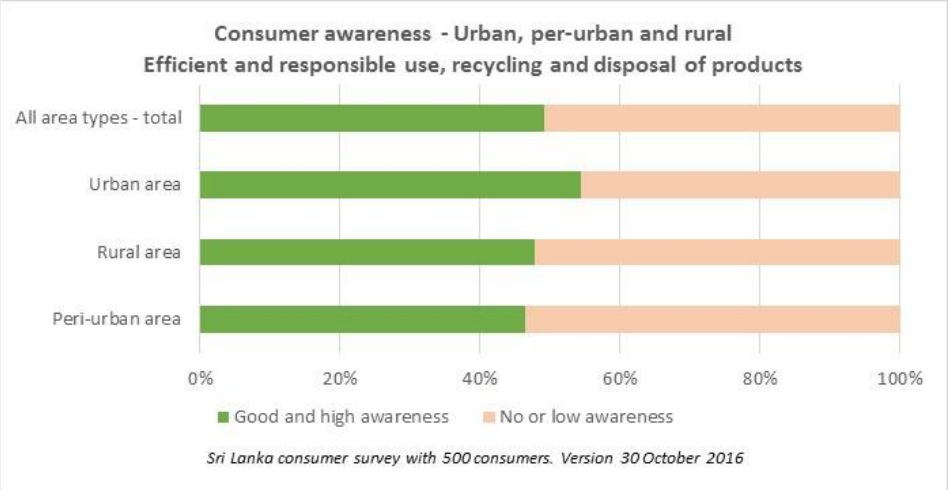
Efficient and responsible use, recycling and disposal of products

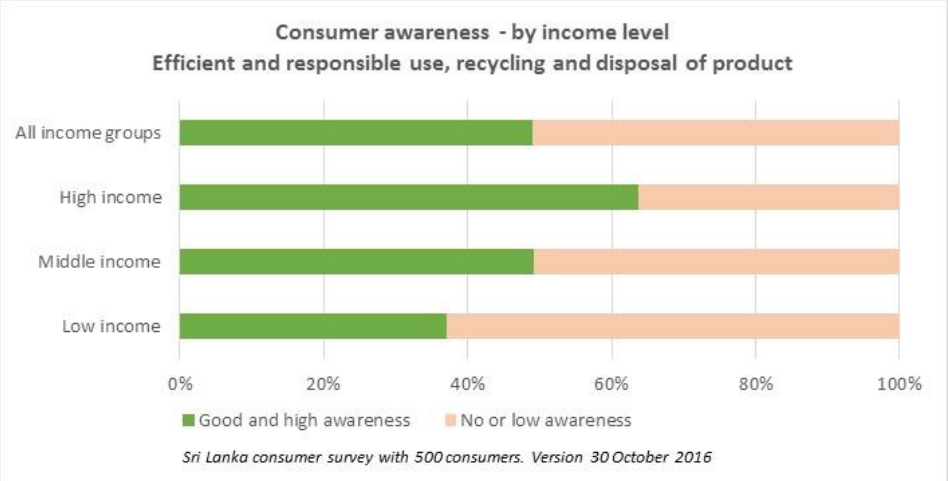
Survey question: How would you rate your awareness on efficient and responsible use, recycling and disposal of products (e.g. food, clothing, household electronics)?

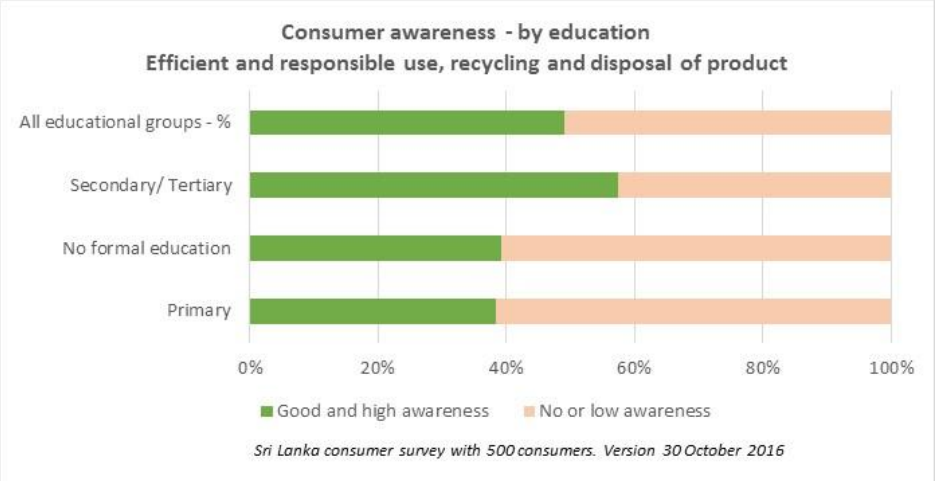
Possible answers:

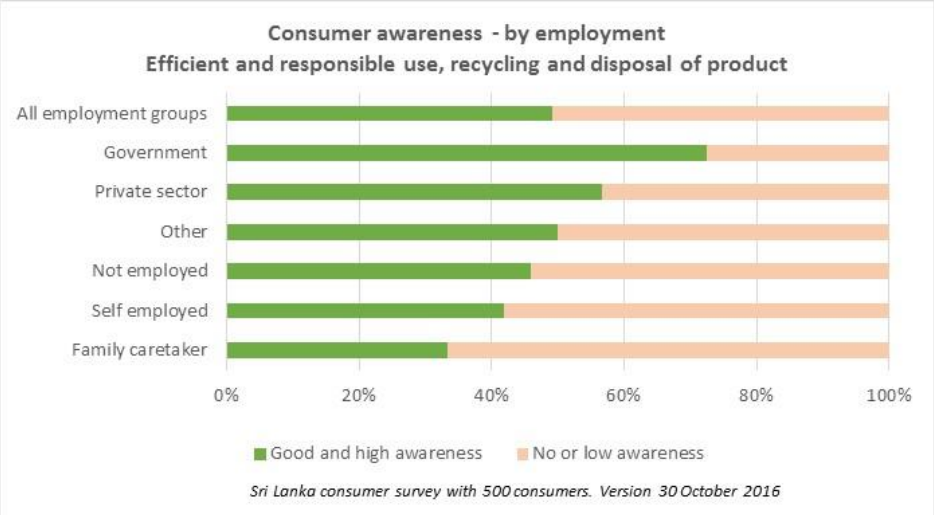
- Not aware at all.
- Some but low awareness.
- Good awareness.
- High awareness.

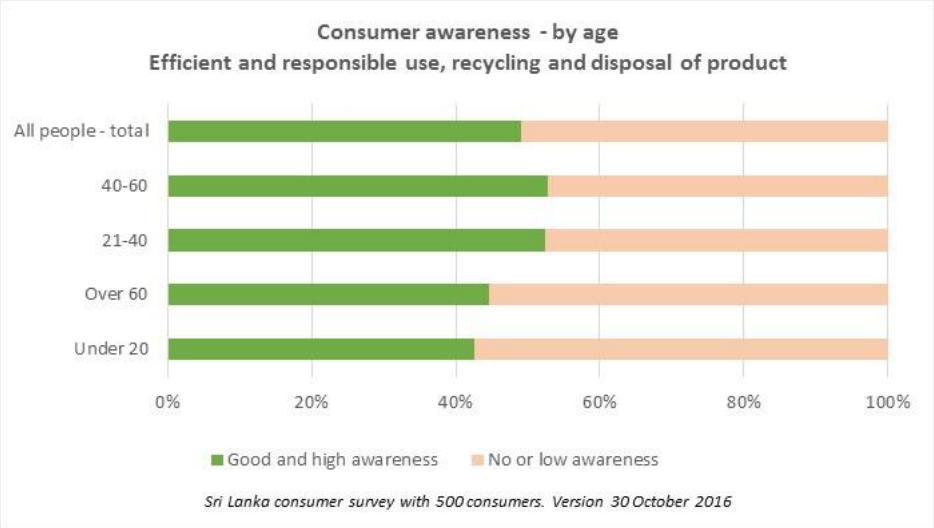



Consumer awareness - Urban, per-urban and rural
Efficient and responsible use, recycling and disposal of products
All area types - total
Urban area
Rural area
Peri-urban area
0%
20%
40%
60%
80%
100%
Good and high awareness
No or low awareness
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016


Consumer awareness - by income level
Efficient and responsible use, recycling and disposal of product
All income groups
High income
Middle income
Low income
0%
20%
40%
60%
80%
100%
Good and high awareness
No or low awareness
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016


Consumer awareness - by education
Efficient and responsible use, recycling and disposal of product
All educational groups - %
Secondary/ Tertiary
No formal education
Primary
0%
20%
40%
60%
80%
100%
Good and high awareness
No or low awareness
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016





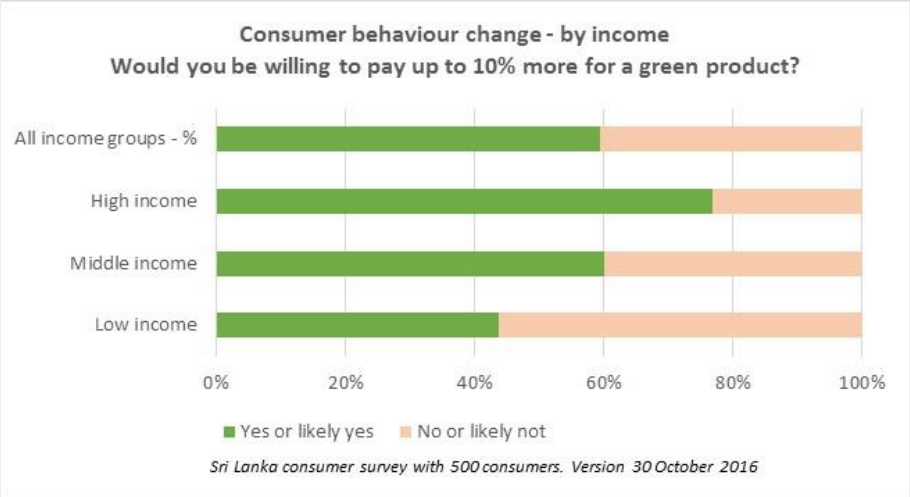
4.4. Behaviour change

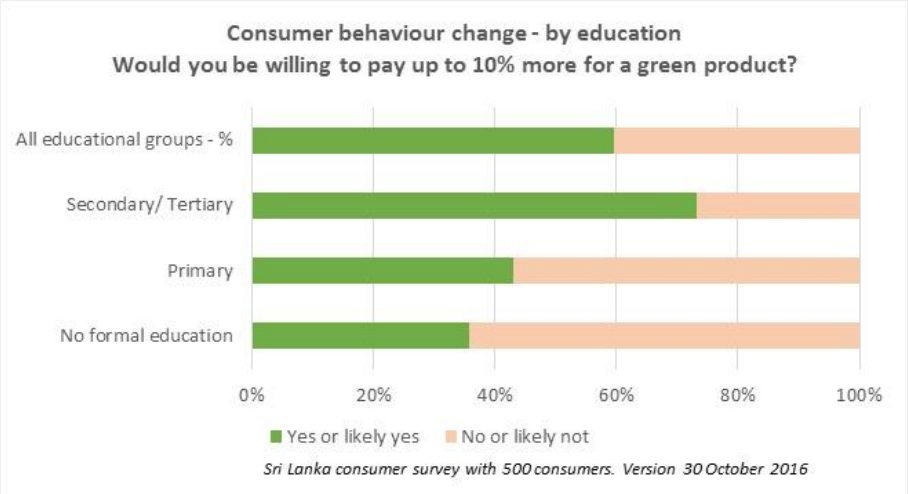
Willingness to pay 10% more for a green product

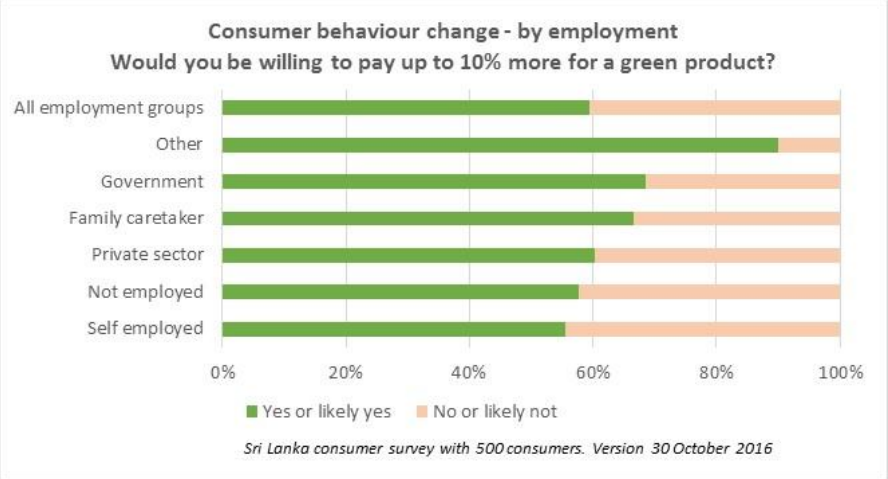
Survey question: Would you be willing to pay up to 10% more for a green product? (e.g. organic or eco-labelled products)?

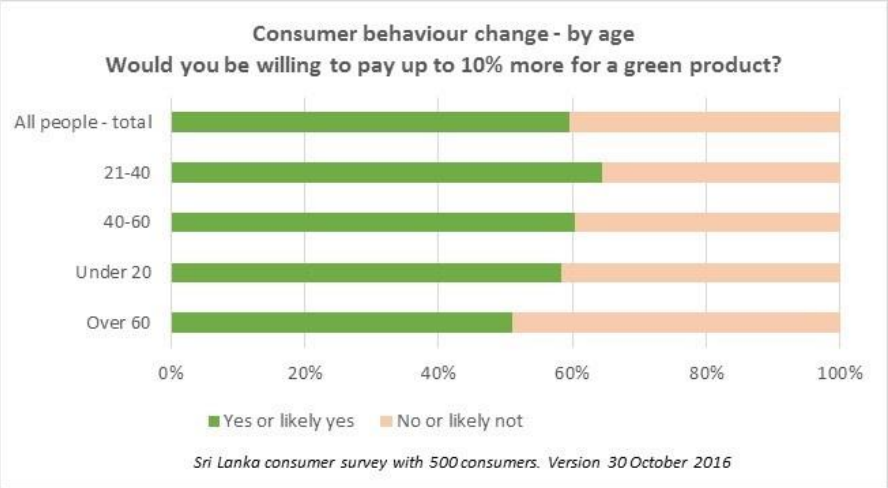
Possible answers:

- Definite no.
- Likely not.
- Likely yes.
- Definite yes.


Consumer behaviour change - by income
Would you be willing to pay up to 10% more for a green product?
All income groups - %
High income
Middle income
Low income
0%
20%
40%
60%
80%
100%
Yes or likely yes
No or likely not
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016


Consumer behaviour change - by education
Would you be willing to pay up to 10% more for a green product?
All educational groups - %
Secondary/ Tertiary
Primary
No formal education
0%
20%
40%
60%
80%
100%
Yes or likely yes
No or likely not
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016


Consumer behaviour change - by employment
Would you be willing to pay up to 10% more for a green product?
All employment groups
Other
Government
Family caretaker
Private sector
Not employed
Self employed
0%
20%
40%
60%
80%
100%
Yes or likely yes
No or likely not
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016



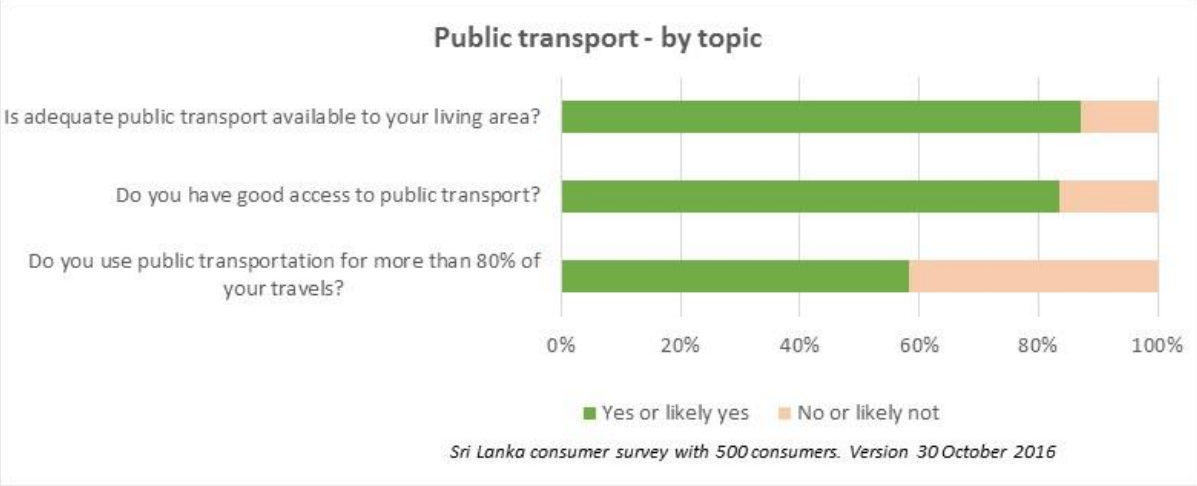
Public transport

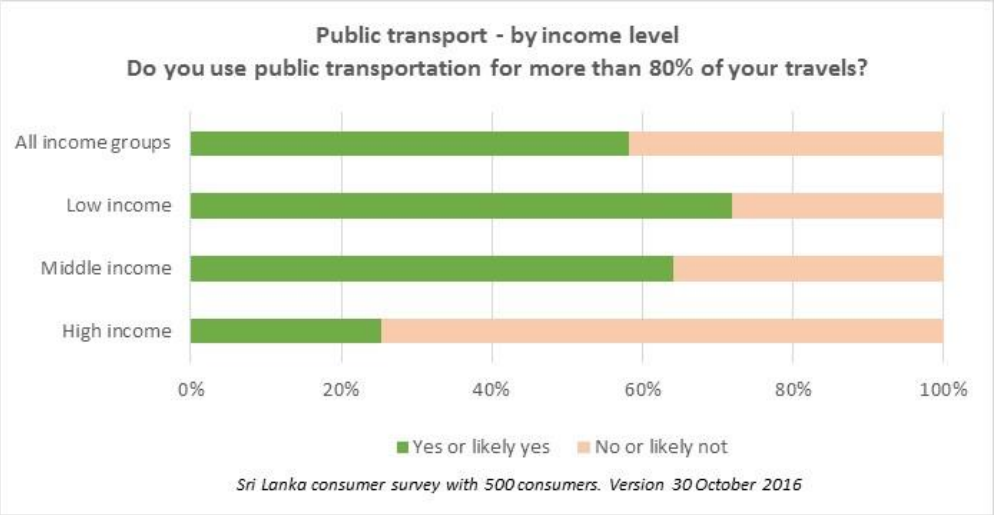
Survey questions:

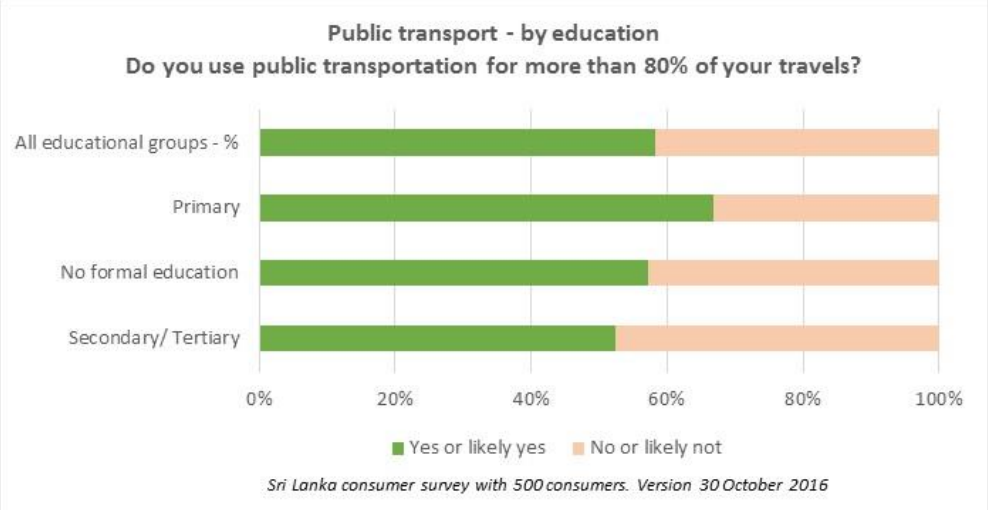
- Do you use public transportation for more than 80% of your travels?
- Do you have good access to public transport?
- Is adequate public transport available to your living area?

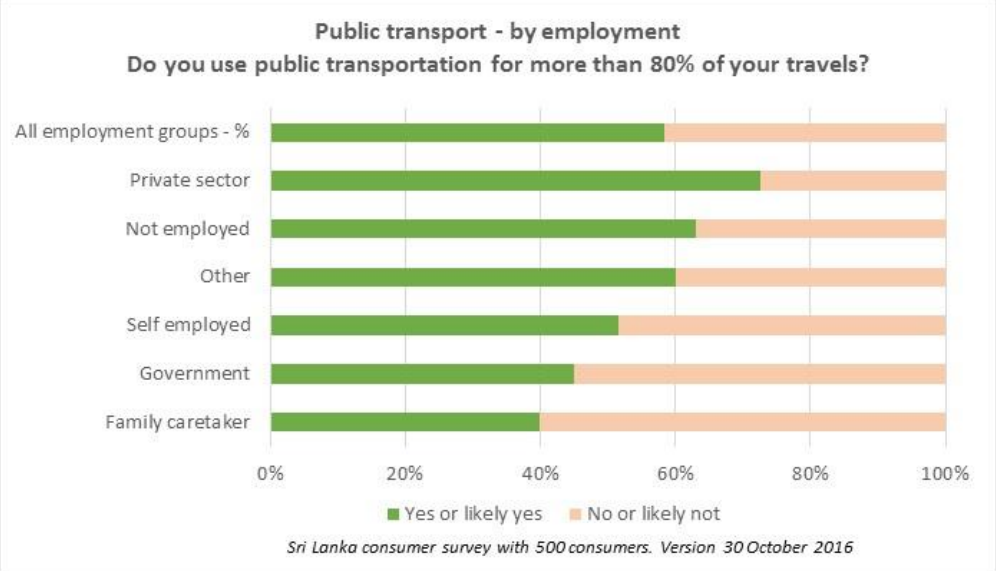
Possible answers:

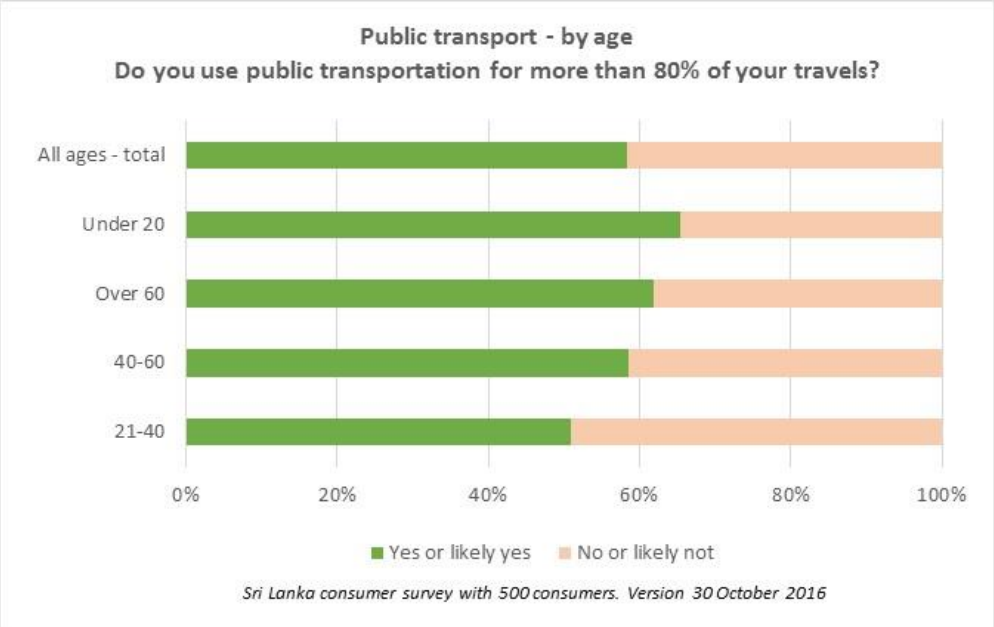
- Definite no.
- Likely not.
- Likely yes.
- Definite yes.




Public transport - by income level
Do you use public transportation for more than 80% of your travels?
All income groups
Low income
Middle income
High income
0%
20%
40%
60%
80%
100%
Yes or likely yes
No or likely not
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016


Public transport - by education
Do you use public transportation for more than 80% of your travels?
All educational groups - %
Primary
No formal education
Secondary/ Tertiary
0%
20%
40%
60%
80%
100%
Yes or likely yes
No or likely not
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016


Public transport - by employment
Do you use public transportation for more than 80% of your travels?
All employment groups - %
Private sector
Not employed
Other
Self employed
Government
Family caretaker
0%
20%
40%
60%
80%
100%
Yes or likely yes
No or likely not
Sri Lanka consumer survey with 500 consumers. Version 30 October 2016



4.5. Factors influencing purchases

Survey question: What are the top three factors influencing your decisions in buying food and beverage products?

Possible answers: As listed in table below.

Table 3: Top factors influencing consumer decisions in buying food/beverage products

Factors influencing purchases	Percentage[9]
Product price	**26%**
Product quality	**26%**
Product shell life	**23%**
Brand	9%
Positive and negative health impacts on consumer	7%
Product appearance	5%
Environmental impacts during production use and disposal	1%
Product packaging	2%

4.6. Sustainable consumption and production priorities

Survey question: In your view, what are the top three priorities to be addressed and improved in Sri Lanka?

Possible answers: As listed in table below.

Table 4: Consumer views on top three priorities to be addressed and improved in Sri Lanka?

Top three priorities	Percentage[10]
Sustainable and responsible use of natural resources	**21%**
Increase education and awareness on environmental and sustainability issues	**21%**

9 Based on counts of top three factors as selected by consumers who participated in survey.

10 Based on counts of top three priorities as selected by consumers who participated in survey.

Top three priorities	Percentage[10]
Increase water efficiency and reduce water wastage	**17%**
Better waste reuse, recycling and disposal	13%
Improve availability and access to public transport	10%
Increase energy efficiency and use of renewable energy	4%
Increase cleaner and more resource efficient production	3%
Improve design and development of green products	3%
Increase government procurement of green products and services	3%
Promotion of green products	1%
Increase energy efficiency of buildings	1%
Other	1%
Reduce environmental impacts of people's lifestyles	0%

5. RESULTS PRODUCTION SURVEYS IN DAIRY, TEA, RICE PROCESSING

5.1. Introduction

The objective of the production survey undertaken as part of the baseline assessment is to understand the current penetration of sustainable production concepts in selected pilot sub-sectors (dairy, tea and rice processing) in Sri Lanka and collect data to support the baseline assessment. The survey was undertaken through ISB Consultants through company visits with a sample of 24 dairy processing factories, 100 tea processing factories, and 100 rice processing factories using a customised questionnaire. The draft questionnaire and survey sampling was discussed in stakeholder inception workshop on 28 April 2016 (Appendix 4), and the results of the surveys were presented and discussed in validation workshop on 27 October 2016 (Appendix 5).

The survey covered the following topics:

- Factory inputs and outputs.
- Certification and eco-labelling.
- Awareness.
- Policy and sectoral support.
- Promoting good practices.

Further details on the production surveys are included in Appendix 3, including the questionnaire and sampling of surveyed factories. Key survey results are presented in the following sections.

5.2. Key findings

Business awareness:

- Overall, tea sector shows higher awareness than rice and dairy processing. This can be explained by export-driven market of the Sri Lanka tea sector.
- All three sectors have good awareness on consumer protection/health and cleaner production.
- Climate change, carbon footprint and associated business opportunities scored lowest on awareness.

International standards:

- Certified management systems on food safety, environment, energy, and OH&S have received no or little attention in rice and dairy processing.
- Implementation of certified management system is higher in tea sector because of international requirements, including Rain Forrest Alliance. About 30% of tea industry has a certified management systems.

Need for policy and sectoral support:

- Technologies, capacity building, international good practices and green finance were rated as the highest priority.
- For tea sector, higher identified need for support on green products (e.g. increase demands, support export).

Quantitative analysis:

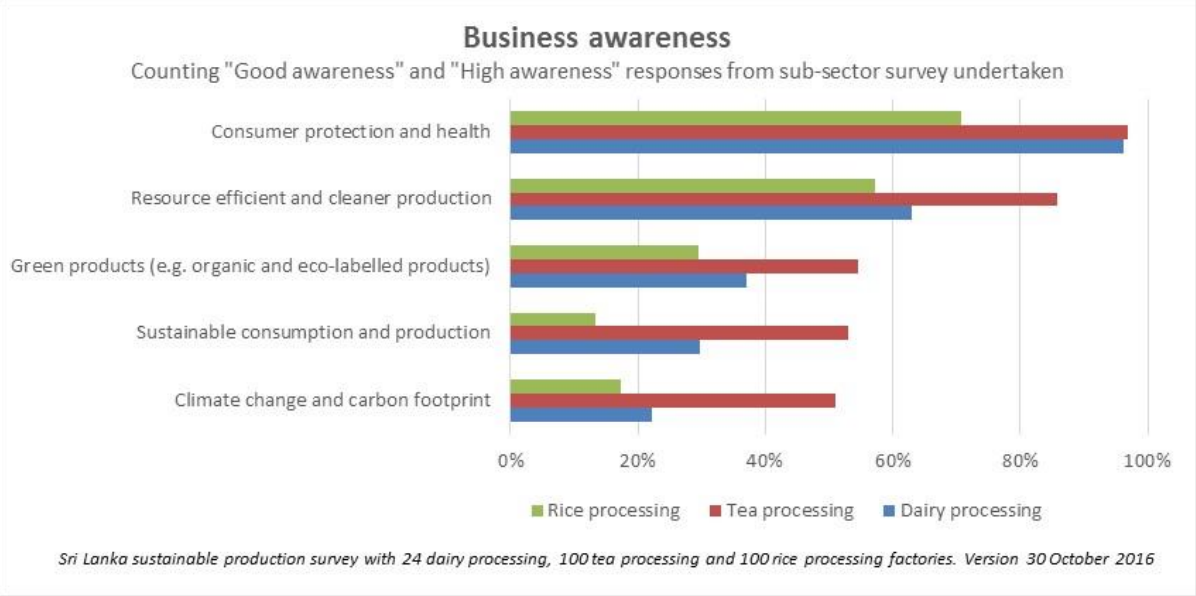
- Sri Lankan tea sector seems to have favourable performance against international benchmarks.
- There is a need for further international data to benchmark specific products in Sri Lankan rice and dairy processing sectors.
- Many companies do not have proper data systems to understand and monitor their SCP performance.

5.3. Business awareness

Survey question: How would you rate your awareness on the following issues, and associated business opportunities?

Possible answers:

- Not aware at all.
- Some but low awareness.
- Good awareness.
- High awareness.



5.4. International standards

Survey questions (yes / no answers):

- Does your factory have a certified food safety management system (ISO 22000)?
- Does your factory have a certified environmental management system (e.g. ISO 14001)?
- Does your factory have a certified energy management system (e.g. ISO 50001)?
- Does your factory have a certified OH&S management system (e.g. OHSAS 18001)?
- Tea sector only: Does your factory have a certified Rain Forrest Alliance certification?

Table 5: Does your factory have the following certified management system(s) in place?[11]

International standards	Dairy processing	Tea processing	Rice processing
Sri Lanka sustainable production survey with 24 dairy processing, 100 tea processing and 100 rice processing factories. Version 30 October 2016			
Certified food safety management system (e.g. ISO 22000)	7%	29%	1%
Certified environmental management system (e.g. ISO 14001)	7%	4%	0%
Certified energy management system (e.g. ISO 50001)	0%	0%	0%
Certified occupational health and safety system (e.g. OHSAS 18001)	11%	3%	0%
Certified Rain Forrest Alliance certification	N/A	18%	N/A

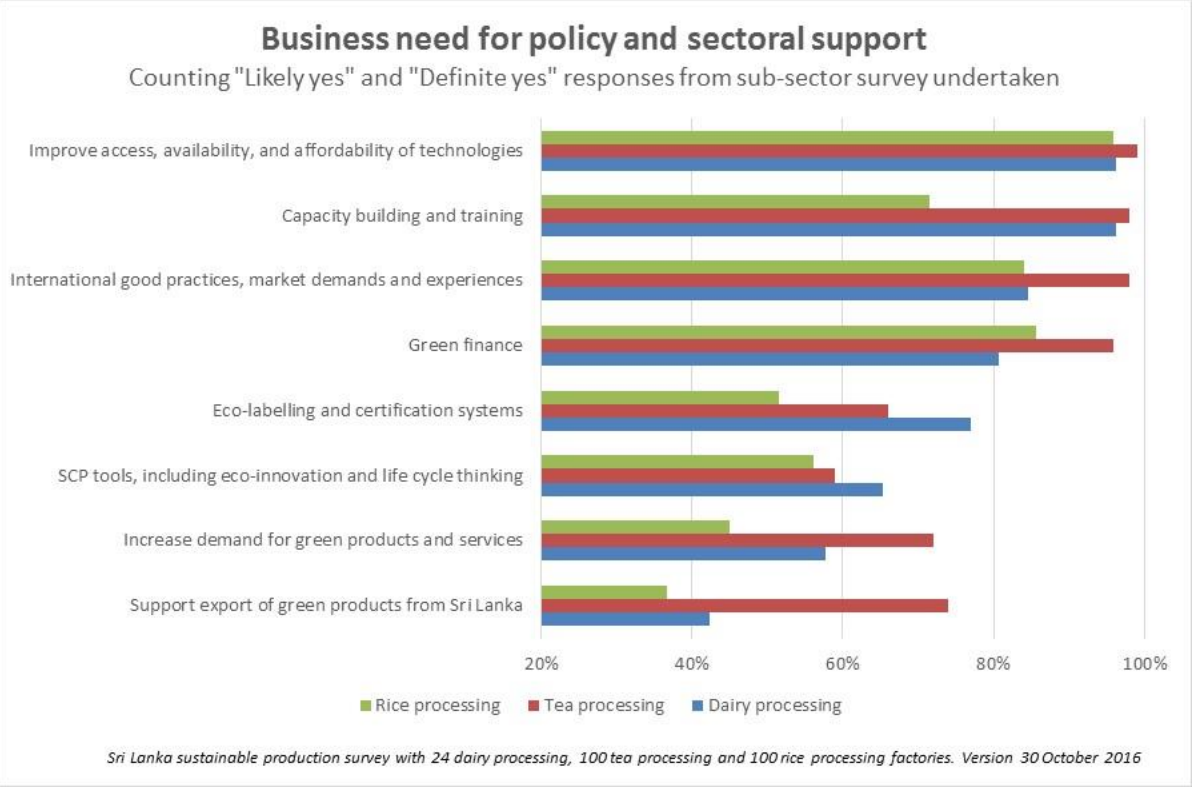
5.5. Need for policy and sectoral support

Survey question: What are key areas where your factory would benefit from policy and sectoral support for the implementation of sustainable consumption and production practices?

11 Counting "Yes" responses from sub-sector survey undertaken. Dairy processing: Only micro, small, and medium size companies. Large dairy processing companies did not (yet) provide responses.

Possible answers:

- Definite no.
- Likely not.
- Likely yes.
- Definite yes.



5.6. Qualitative results and benchmarking

5.6.1. Dairy processing

The benchmark values are useful to position the dairy industry in relation to milk industries of other countries which helps to develop resource productivity improvement programs. Benchmarks are obtained from other source documents published by internationally reputed agencies or from cited research studies.

Table 6 below shows the comparative benchmark values for milk production in other countries along with baseline values obtained for Sri Lanka through the industry survey in the dairy sector. The results when further analysed according to size of the industry indicate that the micro industries in the dairy sector use a high-energy input (17,660 kilojoules per kg of milk input) to produce a unit of milk compared to industry average (1,213 kilojoules per kg of milk input). This is because the electricity consumption, fossil fuel consumption and biomass energy consumption per unit input are higher in micro industries than those of large industries. The consumption of water and generation of wastewater is also high in micro industries than that of SMEs and large industries. The trend shows a great potential for improvement in resource efficiency through improved technology, process control practices and capacity building in the micro industries of the dairy sector.

According to benchmark values available from FAO the milk industry performs better than other countries in electrical and biomass energy use for processing milk. However, the water use and the waste water generation is well above the international figures showing a vast potential to improve water management in the sector. Further, solid waste generation is extremely low in Sri Lanka compared to international benchmarks indicating further studies are necessary to ascertain the values obtained by the survey.

5.6.2. Tea processing

The benchmark values are useful to position the tea industry in relation to tea industries of competing countries, which helps to develop resource productivity improvement programs. Benchmarks are

obtained from other source documents published by internationally reputed agencies or from cited research studies.

Tea industry is a well-managed industry as the product is made for export. However, as shown in Table 7, the performance can be further improved in small and medium sector tea factories. The out turn is 21.5% in all sectors where as the range is shown as 22%-28%. The baseline electrical energy consumption in tea industry shows that the industry is performing better than the SLSEA benchmarks but when compared to Kenya tea industry Sri Lankan tea industry uses higher amount of electrical energy per kg of made tea. According to international figures (see Table 7), the situation in Sri Lanka is less-optimal when it comes to biomass. Kenya tea industry uses a much small amount of biomass energy when compared to Sri Lankan tea industry.

The benchmark values indicate that there is a tremendous potential to improve resource efficiency in the tea industry especially in energy efficiency in electrical equipment usage and thermal equipment. The older technologies used for hot air generation using biomass can be a major reason and therefore technology upgrading and improved process control are urgent needs in the tea industry to enhance the resource efficiency.

5.6.3. Rice processing

The benchmark figures values useful to position the rice processing industry in relation to rice processing industries of other countries which helps to develop resource productivity improvement programs and land use for paddy cultivation. Benchmarks are obtained from other source documents published by internationally reputed agencies or from cited research studies.

Rice processing is a wide spread industry having over 7,500 mills. The recent trend is that the small mills are getting closed while large mills thrive in a competitive market. Table 8 shows the baseline findings of the rice processing sub-sector as well as benchmarks from international sources.

The total energy consumption in the Sri Lankan rice sector (1,840 KJ per kg rice product) is somewhat higher than international benchmarks (1,529 KJ per kg rice product). The electrical energy consumption in the sector (166 kJ per kg of rice product) is lower than international figures (377 KJ per rice product), however the electrical energy consumption in small mills is significantly higher making their cost of production higher as well. The thermal energy consumption in small, medium and large factories in the sector (3,080 kJ per kg of rice product) is high compared to international benchmarks (1,252 KJ per kg of rice product). The values show a potential of high energy efficiency improvements in the sector. The water use and the waste water generation in the small mill sector is high whereas industry average is comparable with international benchmarks.

The rice milling sector is suffering from use of low technology leading to high wastes and poor resource efficiency. Application of SCP through technology transfer, industry best practices and capacity building for rice mill owners and employees can make a significant improvement in this sector.

Table 6: Dairy processing - Qualitative results from survey and international benchmarks

Dairy processing sub-sector			Sampling size - number of factories surveyed							
			24			10	12	5	Micro enterprise = Milk input is less than 25,000 liters/year SME = Milk input between 25,000 - 10,000,000 liters milk input per year Large factory = More than 10,000,000 liters milk input per year	
Topic	**Indicator**	**Unit**	**All factories surveyed**			**Average by factory size**			**(Inter)/national benchmarks**	**Reference**
			2015 baseline	**Lowest value**	**Highest value**	**Micro enterprises**	**SMEs**	**Large factories**		
Material use	Total raw milk use (liquid milk only) - accounted by survey	kg per year	**70,237,791**	n/a	n/a	98,739	3,692,052	66,447,000	Not applicable (total quantity)	
Material use	Total raw milk use (milk powder) - accounted by survey	kg per year	**28,320**	n/a	n/a	240	28,080	0	Not applicable (total quantity)	
Material use	Percentage of reconstituted milk in total milk product output	Ratio	**Currently not available**	Currently not available	Currently not available	Currently not available	Currently not available	Currently not available	Not available	
Energy	Total energy consumption per weight of milk input	Kilojoules per kg of milk input (liquid + powder)	**1,739**	506	70,029	17,660	12,641	1,484	610 KJ per kg of milk input	Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Electricity consumption per weight of milk input	Kilojoules per kg of milk input (liquid + powder)	**462**	0.0	17,391	2,394	602	474	200 KJ per kg of milk input	FAO corporate document repository. Utilisation of renewable energy sources and energy-saving technologies.
Energy	Fossil fuel consumption per weight of milk input	Kilojoules per kg of milk input (liquid + powder)	**737**	0.0	46,500	6,028	4,268	494	165.8 KJ per kg of milk input	Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Biomass fuel consumption per weight of milk input	Kilojoules per kg of milk input (liquid + powder)	**539**	0.0	68,870	9,238	7,771	516	600 – 720 KJ per kg of milk input (liquid +powder)	FAO corporate document repository. Utilization of renewable energy sources and energy-saving technologies
Water	Water use per weight of liquid milk input	Liters water per kg liquid milk input	**4.1**	0.3	20.0	4.8	3.9	4.3	• 1.3 Liters water per kg liquid milk input (year 2005) • 1.6 Liters water per kg liquid milk input (year 1997)	Dairies UK (2005). Kansas University (1997).

Dairy processing sub-sector			Sampling size - number of factories surveyed							
			24			10	12	5		
Topic	Indicator	Unit	All factories surveyed			Average by factory size			(Inter)/national benchmarks	Reference
			2015 baseline	Lowest value	Highest value	Micro enterprises	SMEs	Large factories		
Water	Waste water per weight of liquid milk input	Liters effluent per kg liquid milk input	**3.0**	0.2	16.7	4.7	3.5	2.9	• Drinking milk: 0.8 – 1.7 Liters effluent per kg liquid milk input • Ice cream: 2.7 – 4.0 Liters effluent per kg liquid milk input	EnviroChemie (2010). White paper on wastewater treatment in dairy Industry
Waste & by-products	Solid process waste and ash biomass per weight of milk input	kg waste per kg liquid milk input	**0.0305**	0.000	0.2087	0.009	0.009	0.0433	0.5 kg of sludge per kg COD removed through anaerobic process	FAO corporate document repository. Management of Waste from Animal Product Processing.
Packaging	Percentage of products produced with bio-degradable packaging	%	**25%**	0%	90%	22%	30%	20%	Not available	
Packaging	Percentage of products labelled with nutritional and ingredient information	%	**43%**	0%	100%	0%	55%	100%	Not available	
Other indicator units										
Energy	Electricity consumption per weight of milk input	kWh per kg of milk input (liquid + powder)	**0.128**	0.000	4.831	0.665	0.167	0.132	0.056 kWh per kg of milk input (liquid + powder milk)	FAO corporate document repository. Utilisation of renewable energy sources and energy-saving technologies.
Energy	Biomass fuel consumption per weight of milk input	kg biomass per kg of milk input (liquid + powder)	**0.033**	0.000	4.251	0.570	0.480	0.032	0.037 - 0.044 kg per kg of milk input (liquid + powder milk)	FAO corporate document repository. Utilisation of renewable energy sources and energy-saving technologies.

Micro enterprise = Milk input is less than 25,000 liters/year

SME = Milk input between 25,000 - 10,000,000 liters milk input per year

Large factory = More than 10,000,000 liters milk input per year

Table 7: Tea processing - Qualitative results from survey and international benchmarks

Small factory = Green leave input less than 3,000 metric tonnes/year
Medium factory = Green leave between 3,000 - 10,000 metric tonnes/year
Large factory = More than 10,000 metric tonnes of green leave input/year

Tea processing sub-sector			Sampling size - number of factories surveyed							
			100			64	32	4		
Topic	Indicator	Unit	All factories surveyed			Average by factory size			(Inter)/national benchmarks	Reference
			2015 baseline	Lowest value	Highest value	Small factories	Medium factories	Large factories		
Material use	Total use of green tea leaves - accounted by survey	Kilotonnes per year	**314.2**	n/a	n/a	107.4	147.2	60	Not applicable (total quantity)	
Material use	Production efficiency - nett tea out turn	%	**21.5%**	13.3%	25.3%	21.8%	20.8%	21.3%	• 22% - 28% • 24% - 25.5%	EL Keegal (1955). Ziad Mohamod (2003).TRI.
Energy	Total energy consumption per made tea (all types)	Kilojoules per kg of made tea	**46,522**	4,455	112,760	72,748	45,630	19,465	33,144 KJ per kg of made tea	Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Electricity consumption per weight of made tea (all tea types)	Kilojoules per kg of made tea	**2,638**	234	11,415	3,057	2,589	2,155	• 2,808 KJ per kg of made tea • 1,714 KJ per kg of made tea	Sri Lanka Sustainable Energy Authority Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Electricity consumption per weight of made tea (Orthodox only)	Kilojoules per kg of made tea (Orthodox only)	**2,626**	234	6,240	2,761	2,548	1 sample only		
Energy	Fossil fuel consumption per weight of made tea (all tea types)	Kilojoules per kg of made tea	**276**	0	330	386	113	330	280 KJ per kg of made tea	Sri Lanka Sustainable Energy Authority.
Energy	Fossil fuel consumption per weight of made tea (Orthodox only)	Kilojoules per kg of made tea (Orthodox only)	**264**	0	330	379	202	1 sample only		
Energy	Biomass fuel consumption per weight of made tea (all tea types)	Kilojoules per kg of made tea	**43,608**	2,045	348,236	69,305	42,929	16,980	• 32,320 KJ per kg of made tea • 48,276 kJ per kg of made tea • 31,430 kJ per kg made tea	Sri Lanka Sustainable Energy Authority Ena/Malawian Tea (2015). International conference on ICUE. Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Biomass fuel consumption per weight of made tea (Orthodox only)	Kilojoules per kg of made tea (Orthodox only)	**50,099**	2,045	110,296	60,577	43,221	1 sample only		
Waste & by-products	Refuse tea per green tea leaves input	%	**1.8%**	0.2%	3.4%	2.1%	1.7%	1.7%	2% - 7%	EL Keegal (1955). Ziad Mohamod (2003).TRI.
Waste & by-products	Ash from biomass per green leaves input	%	**2.7%**	0.1%	7.1%	2.1%	1.2%	2.9%	1.3% - 5.4%	Nike Krajnc (2015). Wood fuels handbook. Food and Agriculture Organisation of United Nations.
Packaging	Percentage of products produced with bio-degradable or recyclable packaging	%	**99.5%**	90.0%	100.0%	99.5%	99.4%	100.0%	Not applicable / available	
Other indicator units										
Energy	Electricity consumption per weight of made tea (all tea types)	kWh per kg of made tea	**0.733**	0.065	3.171	0.849	0.719	0.599	0.48 - 0.89 kJ per kg of made tea	Sri Lanka Sustainable Energy Authority.

Small factory = Green leave input less than 3,000 metric tonnes/year
Medium factory = Green leave between 3,000 - 10,000 metric tonnes/year
Large factory = More than 10,000 metric tonnes of green leave input/year

Tea processing sub-sector			Sampling size - number of factories surveyed							
			100			64	32	4		
Topic	Indicator	Unit	All factories surveyed			Average by factory size			(Inter)/national benchmarks	Reference
			2015 baseline	Lowest value	Highest value	Small factories	Medium factories	Large factories		
Energy	Electricity consumption per weight of made tea (Orthodox only)	kWh per kg of made tea (Orthodox only)	**0.729**	0.065	1.733	0.767	0.708	1 sample only		Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Biomass fuel consumption per weight of made tea (all tea types)	kg biomass per kg of made tea	**2.69**	0.13	21.50	4.28	2.65	1.05	1.94 - 2.98 kg biomass per kg of made tea	Sri Lanka Sustainable Energy Authority. Eco Care International (2006). Energy performance baselines and benchmarks for industrial, commercial and institutional energy users in Kenya.
Energy	Biomass fuel consumption per weight of made tea (Orthodox only)	kg biomass per kg of made tea (Orthodox only)	**3.09**	0.13	6.81	3.74	2.67	1 sample only		

Table 8: Rice processing - Qualitative results from survey and international benchmarks

Rice processing sub-sector			Sampling size - number of factories surveyed						Small factory = Paddy input is less than 1200 metric tonnes/year Medium factory = Paddy input between 1,200 - 2,400 metric tonnes/year Large factory = More than 2,400 metric tonnes per year of paddy input	
			100			26	30	44		
Topic	Indicator	Unit	All factories surveyed			Average by factory size			(Inter)/national benchmarks	Reference
			2015 baseline	Lowest value	Highest value	Small factories	Medium factories	Large factories		
Material use	Total raw materials (paddy use) - accounted by survey	Kilotonnes per year	**312**	n/a	n/a	13.4	51.7	246.7	Not applicable	
Material use	Production efficiency (rice out turn)	%	**74%**	60%	84%	72%	71%	72%	81%	Energies (2009). ISSN 1996-1073, Bangladesh
Energy	Total energy consumption per weight of rice product (raw, par boiled, rice bran, broken rice)	Kilojoules per kg of rice product	**1,840**	566	13,810	4,206	3,394	3,038	1,529 KJ per kg of rice product	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Energy	Electricity consumption per weight of rice product (raw, par boiled, rice bran, broken rice)	Kilojoules per kg of rice product	**166**	61	2,382	538	200	228	377 KJ per kg of rice product	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Energy	Electricity consumption per weight of raw rice product	Kilojoules per kg of raw rice	**191**	60	780	324	122	203	331 KJ per kg of raw rice product	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Energy	Electricity consumption per weight of par boiled rice product	Kilojoules per kg of par boiled rice	**163**	82	2,945	855	270	222	377 KJ per kg of par boiled rice product	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Energy	Fossil fuel consumption per weight of par boiled rice product	Kilojoules per kg of par boiled rice	**17**	0.0	849	0.61	0.00	42	Not available	
Energy	Biomass (rice husk) fuel consumption per weight of par boiled rice product	Kilojoules per kg of par boiled rice	**3,063**	0.0	16,917	4,619	2,703	3,229	1,252 KJ per kg of par boiled rice product	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Water	Water use per weight of par boiled rice product	Liters water per kg par boiler rice	**1.03**	0.29	8.00	2.06	1.58	1.44	• 1 liter water per kg par boiled rice • 1 - 1.5 liters water per kg par boiled rice	A. Pradhan, S.K. Sahu, Jr. Industrial Pollution Control 20 (1) (2004) International Journal of Life Sciences, bio technology and pharma research July 2013
Water	Waste water per weight of par boiled rice product	Liters effluent per kg par boiled rice	**0.84**	0.21	8.30	1.27	1.72	1.24	0.4 - 0.52 liters of effluent per kg par boiled rice	International Journal of Life Sciences, Biotechnology and Pharma Research July 2013
Waste & by-products	Paddy husk generation per weight of paddy rice input	%	**13.7%**	11.9%	20.0%	15.7%	15.3%	14.8%	0.19 kg waste per kg of rice input	Institute of Development Economies Japan (2012). Bangladesh

Rice processing sub-sector			Sampling size - number of factories surveyed						Small factory = Paddy input is less than 1200 metric tonnes/year Medium factory = Paddy input between 1,200 - 2,400 metric tonnes/year Large factory = More than 2,400 metric tonnes per year of paddy input	
			100			26	30	44		
Topic	Indicator	Unit	All factories surveyed			Average by factory size			(Inter)/national benchmarks	Reference
			2015 baseline	Lowest value	Highest value	Small factories	Medium factories	Large factories		
Waste & by-products	Ash from biomass per weight of paddy rice input	%	**1.6%**	0.0%	9.8%	3.5%	2.4%	2.2%	4% - 6%	Srinath S., Venkat R.G. Combustion and emission characteristics of rice husk in a rectangular fluidized bed combustor. Department of Chemical Engineering National Institute of Technology India.
Waste & by-products	Percentage of organic wastes being used as energy feedstock or other uses	%	**78%**	0%	100%	77%	83%	76%	50% - 84%	Sustainable Energy for Development Germany. Data Bangladesh.
Packaging	Percentage of products produced with recyclable packaging (e.g. polysacks)	%	**100%**	100%	100%	100%	100%	100%	Not available	
Technology	Percentage of factories using rubber rollers for de-husking	%	**100%**	n/a	n/a	100%	100%	100%	38%	MoFPI (2010) Status of India rice industry. Report of Ministry of Food Processing Industries, pp 8–12.
Other indicator units										
Energy	Electricity consumption per weight of rice product (raw, par boiled, rice bran, broken rice)	kWh per kg of rice product	**0.046**	0.017	0.662	0.150	0.056	0.063	0.046 kWh per kg of rice product	Energies (2009). ISSN 1996-1073, Bangladesh
Energy	Electricity consumption per weight of raw rice product	kWh per kg of raw rice	**0.053**	0.017	0.380	0.090	0.034	0.110	0.092 kWh per kg of raw rice	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Energy	Electricity consumption per weight of par boiled rice product	kWh per kg of par boiled rice	**0.046**	0.023	0.818	0.238	0.075	0.062	0.105 kWh per kg of raw rice	Goyal S.K., Jogdand S.V., Agrawal A.K. (2014). Energy use pattern in rice milling industries - a critical appraisal. J Food Sci Technol.
Energy	Biomass (rice husk) fuel consumption per weight of par boiled rice product	kg rice husk per kg of par boiled rice	**0.211**	0.000	1.167	0.319	0.186	0.223	0.22 kg rice husk per kg of par boiled rice	Energies (2009). ISSN 1996-1073, Bangladesh

6. NATIONAL SCP INDICATORS

6.1. Overview

Chapter 2 discussed that there are currently no integrated or formalised monitoring schemes for SCP in place at national or sub-sectoral level. At the moment individual institutions develop and monitor their own indicators (e.g. energy, water, waste, greenhouse gas emissions, sub-sectoral specific parameters). Given the increasing importance of SCP-related issues and SDGs, there is a clear need for integrated monitoring solutions. This is also one the key justifications for undertaking this baseline assessment with a strong focus on SCP indicators.

As outlined in Chapter 3 on international experiences, governments in all countries use indicators for multiple purposes in various policy areas. Indicators convey information about the current situation using a format that is easy to understand. In summary, the purpose of SCP indicators is to assist in monitoring progress towards SCP objectives, monitoring trends in areas of key relevance to SCP, benchmarking with patterns of consumption and production in other countries, and raising awareness of the importance of SCP and to improve accountability.

The process applied as part of this baseline assessment to develop and implement national SCP indicators for Sri Lanka is provided in the figure below. Key results from this process to date are included in this chapter.

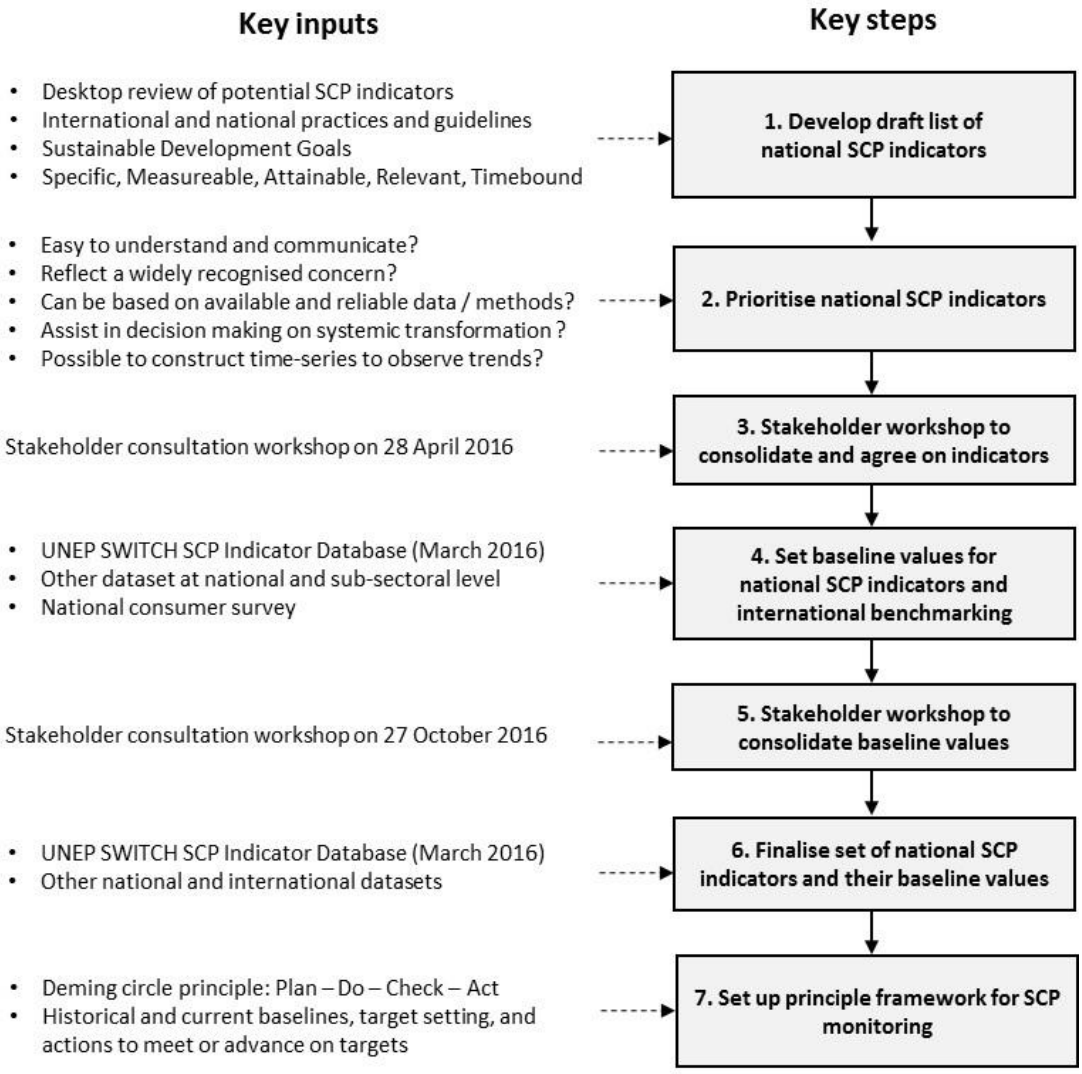


Figure 6: Process to develop and implement national SCP indicators for Sri Lanka

6.2. Proposed national SCP indicators

Based on the development process outlined in figure above, Table 9 presents the proposed national SCP indicators for Sri Lanka. The listing includes 12 headline indicators and 36 first priority indicators. The second priority SCP indicators (38 in total) are for future consideration as the SCP indicator framework further evolves over time. The indicators cover the following topics:

- Material use.
- Energy.
- Greenhouse gas emissions.
- Water.
- Waste.
- Consumer awareness.
- Consumer behaviour.
- Health & safety.
- Biodiversity.
- Mobility.
- Policy & regulations.
- Research & development.
- International standards.
- Human development.
- Knowledge & education.

The (potential) sources to quantify the proposed indicators and cross-references to the Sustainable Development Goals (SDGs) are provided in the table as well. The definition and scope of the terminology used for the proposed indicators (e.g. material footprint, energy and carbon footprint, water use) are based on international standards, and are these definitions are summarised in the glossary of this report.

Table 9: Proposed national SCP indicators

Topic	SCP Indicator	Source	Reference to SDGs	
			SDG	Indicator
Headline SCP indicators (12 in total)				
Material use	Material footprint (Total)	UNEP SWITCH Indicator Database (March 2016)	12 8	12.2.1 8.4.1
	Material footprint per GDP	UNEP SWITCH Indicator Database (March 2016)	12 8	12.2.1 8.4.1
Energy	Energy footprint (total)	UNEP SWITCH Indicator Database (March 2016)	7	7.3.1
	Energy footprint per GDP	UNEP SWITCH Indicator Database (March 2016)	7	7.3.1
Greenhouse gas emissions	Carbon footprint (total)	UNEP SWITCH Indicator Database (March 2016)	13	13.2.1
	Carbon footprint per GDP	UNEP SWITCH Indicator Database (March 2016)	9 13	9.4.1 13.2.1
Water	Total water use per capita	UNEP SWITCH Indicator Database (March 2016)	6	6.4.1
	Domestic water use per capita	National Water Supply and Drainage Board	6	6.4.1
Waste	Total municipal solid waste generation	Central Environment Authority		
	Percentage of municipal solid waste recycled	Central Environment Authority	12 11	12.5.1 11.6.1
Consumer awareness	Percentage of consumers with awareness on sustainable use, recycling and disposal of products	Consumer survey on SCP		
Health & safety	Number of persons injured or killed in accidents in work place	Labour Department	8	8.8.1
First priority SCP indicators (36 in total)				
Material use	Domestic Material Consumption (Total)	UNEP SWITCH Indicator Database (March 2016)	8	8.4.2
	Domestic Material Consumption per GDP	Calculation based on UNEP SWITCH Indicator Database (March 2016)	8	8.4.2

Topic	SCP Indicator	Source	Reference to SDGs	
			SDG	Indicator
	Domestic Material Consumption per capita	UNEP SWITCH Indicator Database (March 2016)	8	8.4.2
Energy	Share of renewable energy in total primary energy supply	Calculation based on UNEP SWITCH Indicator Database (March 2016)	7	7.2.1
	Percentage of population with access to electricity	Public Utilities Commission	7	7.1.1
Greenhouse gas emissions	Carbon footprint per capita	UNEP SWITCH Indicator Database (March 2016)	13	13.2.1
Air emissions	Air quality index for Colombo Metro	Ministry of Environment, Air Quality Monitoring Division	11	11.6.2
	Air quality index for Kandy City	Ministry of Environment, Air Quality Monitoring Division	11	11.6.2
Water	Water use (total)	UNEP SWITCH Indicator Database (March 2016)	6	6.4.1
	Percentage of population with access to potable water	Water Resources Board and HIES report	6	6.2.1
	Percentage of total ground water level and quality samples below desired standards	Water Resources Board / Central Environmental Authority	6	6.3.2
Waste	Total solid commercial and industrial waste generation	Central Environment Authority		
	Total hazardous waste generation	Central Environment Authority and Holcim		
	Total hazardous waste generation per capita	Central Environment Authority and Holcim	12	12.4.2
	National food loss index	Ministry of Agriculture and HARTI	12	12.3.1
Biodiversity	Total forest cover in Sri Lanka	World Bank and Department of Forestry	15	15.1.1
	Total use of pesticides and herbicides	Registrar of Pesticides		
Mobility	Share of public transport mode in mobility	Survey by University of Moratuwa	11	11.2.1
	Percentage of population with good access and availability to public transportation	Survey by University of Moratuwa	11	11.2.1
	Percentage of consumers using public transportation for more than 80% of their travels	Consumer survey on SCP		
Consumer awareness	Percentage of consumers with awareness on available green products (e.g. organic or eco-labelled products)	Consumer survey on SCP		
	Percentage of consumers with awareness on the benefits of using local products	Consumer survey on SCP		
	Percentage of consumers with awareness to reduce wasteful consumption	Consumer survey on SCP		
	Percentage of consumers with awareness on the environmental impacts of product packaging	Consumer survey on SCP		
Consumer behaviour	Percentage of consumers willing to pay up to 10% more for a green product (e.g. organic or eco-labelled)	Consumer survey on SCP		
Policy & regulations	Number of product categories included in the Sri Lankan Green Public Procurement system	National Procurement Commission	12	12.7.1
Research and development	Expenditure on R&D for sustainable consumption and production and environmentally sound technologies	Treasury and Ministry of Finance	12	12.a.1
International standards	Number of factories with certified environmental management system in place (e.g. ISO 14001)	ISO certifying agencies		
	Number of factories with certified food safety management system in place (e.g. ISO 22000)	ISO certifying agencies		

Topic	SCP Indicator	Source	Reference to SDGs	
			SDG	Indicator
	Number of factories with certified energy management system in place (e.g. ISO 50001)	ISO certifying agencies		
Human development	Human Development Index (HDI)	HDI global report		
	Gini Index (measure of income distribution in a nation)	World Bank		
Knowledge & education	Number of school education institutions which have clearly incorporated SCP topics in their courses	National Institute of Education	12	12.8.1
	Number of universities which have clearly incorporated SCP topics in their courses	Universities	12	12.8.1
	Number of vocational education institutions which have clearly incorporated SCP topics in their courses	Vocational Training Institute		
	Number of professional education institutions which have clearly incorporated SCP topics in their courses	Organisation of Professional Association (OPA)		
Second priority SCP indicators for future considerations (38 in total)				
Material use	Material footprint per capita	UNEP SWITCH Indicator Database (March 2016)	8	8.4.1
	Domestic Material Consumption (Metal Ores)	UNEP SWITCH Indicator Database (March 2016)	8	8.4.2
	Domestic Material Consumption (Non-Metal Ores)	UNEP SWITCH Indicator Database (March 2016)	8	8.4.2
Energy	Domestic Material Consumption (Fossil Fuels)	UNEP SWITCH Indicator Database (March 2016)	8	8.4.2
	Domestic Material Consumption (Biomass)	UNEP SWITCH Indicator Database (March 2016)	8	8.4.2
	CO2 intensity of building sector and new buildings	Ministry of Environment, Climate Change Unit		
	Total Primary Energy Supply	UNEP SWITCH Indicator Database (March 2016), Sri Lanka Sustainable Energy Authority (SLSEA)	7	7.3.1
	Total Primary Energy Supply (Renewables)	UNEP SWITCH Indicator Database (March 2016), Sri Lanka Sustainable Energy Authority (SLSEA)	7	7.3.1
	Expenditure on fossil-fuel subsidies per unit of GDP	Ministry of Petroleum and Treasury	12	12.c.1
	Expenditure on fossil-fuel subsidies as proportion of total national expenditure on fossil fuels	Ministry of Petroleum and Treasury	12	12.c.1
Air emissions	Total use of Ozone Depleting Substances	Ministry of Environment, Ozone Unit		
Water	Total pipe borne water use per capita (excluding irrigation)	National Water Supply and Drainage Board (2015) + UN World Water Development Report (2006)		
	Total water use per GDP	Calculation based on UNEP SWITCH Indicator Database (March 2016)	6	6.4.1
	Total water use by industries	National Water Supply and Drainage Board (TBC)		
	Water use by industries per GDP	National Water Supply and Drainage Board (TBC)	6	6.4.1
	Total industrial wastewater	Central Environment Authority (and Provincial Environment Authorities)		
Waste	Percentage of population with access to waste collection	National Solid Waste Management Authority and CEA	11	11.6.1

Topic	SCP Indicator	Source	Reference to SDGs	
			SDG	Indicator
	Percentage of organic wastes being used as energy feedstock or other uses	Sustainable Energy Authority		
	Landfilled wastes (households, commercial, industrial) per capita	Central Environment Authority (and local authorities)		
Products	Number of green technology patents, total	Patent Office		
Biodiversity	National biodiversity index for Sri Lanka	IUCN and Ministry of Environment	15	15.5.1
	Hectares of new land acquired for urban, industrial, and agricultural development	Department of Land Use Planning		
Consumer behaviour	Factors influencing consumer decisions in buying food and beverage products • Product price • Product quality • Product shell life • Brand • Positive and negative health impacts on consumer • Product appearance • Product packaging • Environmental impacts during production use and disposal	Consumer survey on SCP		
Policy & regulations	Total number of implemented government initiatives through SCP policies and action plans	Ministry in charge of Environment		
	Green financial incentives distributed by government to industry to decouple growth from resource use	Treasury		
International standards	Number of factories with certified occupational health and safety system in place (e.g. OHSAS)	OHSAS certifying agencies		
Reporting	Number of factories which produce a report on sustainability or carbon foot printing	Ministry in charge of Environment	12	12.6.1
Knowledge & education	Number of teacher trainings which have clearly incorporated SCP in their courses	National Institute of Education	12	12.8.1

6.3. Baseline values for national indicators

Based on the sources provided in Table 9, the proposed national SCP indicators are quantified for the year 2015 and the historical development in five-year time intervals from 1990 to 2010 have been included as well.

Further, an illustrative visual presentation of the historical development of SCP indicators are provided in the following figures. These figures are based on data extracted from the Asia Pacific database on SCP indicators developed by UNEP as part of the EU funded SWITCH Asia Program[12]. Building on this database, further comparative and historical analysis on resource uses in Sri Lanka can be undertaken to meet specific stakeholder demands.

12 www.switch-asia.eu/news/switch-asia-and-uneps-asia-pacific-indicators-for-sustainable-consumption-and-production-featured/

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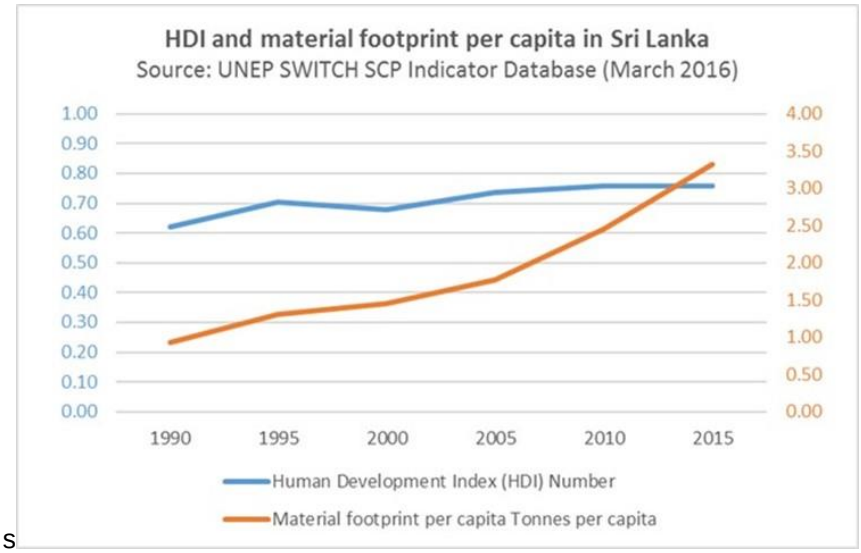
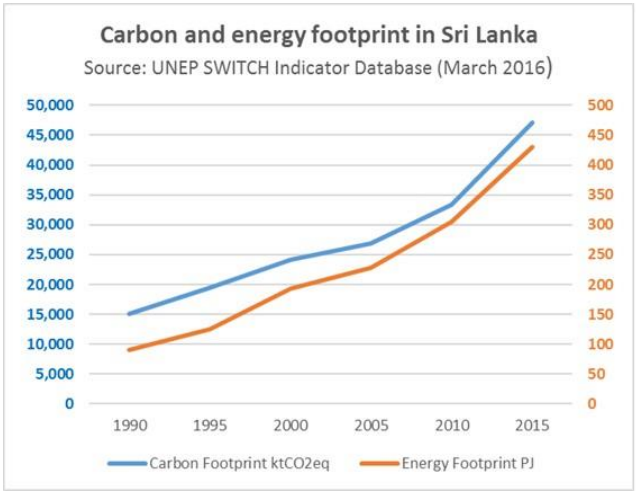


Figure 7: Development of material footprint and Human Development Index (HDI) in Sri Lanka[13]



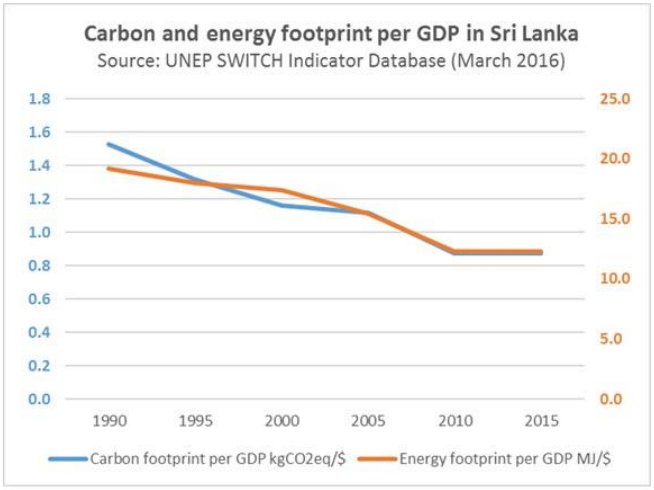


Figure 8: Development of total carbon and energy footprint (per GDP) in Sri Lanka[14]

13 Based on extracted from UNEP (2015), Resource use in the Asia-Pacific - A booklet of infographics, United Nations Environment Programme, Bangkok.

14 Based on data extracted from UNEP (2015), Resource use in the Asia-Pacific - A booklet of infographics, United Nations Environment Programme, Bangkok.

Table 10: National SCP indicators - baseline values

Topic	Indicator	Unit	Values for Sri Lanka					
			1990	1995	2000	2005	2010	2015
Headline SCP indicators (12 in total)								
Material use	Material footprint (Total)	Tonnes per year	16,117,440	23,820,230	27,298,020	35,306,150	50,936,430	**71,927,834**
	Material footprint per GDP	kg per US$ GDP	1.3	1.5	1.4	1.5	1.5	**1.5**
Energy	Energy footprint (total)	Petajoules per year	91	126	193	229	305	**430**
	Energy footprint per GDP	Megajoules per US$ GDP	7.5	8.0	9.6	9.4	9.2	**9.2**
Greenhouse gas emissions	Carbon footprint (total)	Kilotonnes CO2 eq per year	15,011	19,417	24,207	26,922	33,329	**47,064**
	Carbon footprint per GDP	kg CO2 eq per US$ GDP	1.25	1.24	1.21	1.10	1.00	**1.00**
Water	Total water use per capita	kiloliters per capita/year	564	713	690	649	624	**599**
	Domestic water use per capita	kiloliters per capita/year	Not available	Not available	Not available	Not available	28.2	**28.4**
Waste	Total municipal solid waste generation	Kilotonnes per year	Not available	Not available	970	1,037	1,183	**2,446**
	Percentage of municipal solid waste recycled	%	Not available	Not available	<5%	5-7%	13%	**17%**
Consumer awareness	Percentage of consumers with awareness on sustainable use, recycling and disposal of products	%	n/a	n/a	n/a	n/a	n/a	**49%**
Health & safety	Number of persons injured or killed in accidents in work place	Number of people per year	Not available	Not available	Not available	Not available	Approx 14,000	**12,032**
First priority SCP indicators (36 in total)								
Material use	Domestic Material Consumption (Total)	Tonnes per year	34,698,171	37,868,927	36,018,165	61,959,840	74,635,039	**105,392,896**
	Domestic Material Consumption per GDP	kg per US$ GDP	2.89	2.42	1.80	2.54	2.24	**2.24**
	Domestic Material Consumption per capita	Tonnes per capita/year	2.0	2.1	1.9	3.1	3.6	**4.9**
Energy	Share of renewable energy in total primary energy supply	%	71%	58%	54%	51%	52%	**52%**
	Percentage of population with access to electricity	%	Not available	Not available	Not available	Not available	77%	**96%**
Greenhouse gas emissions	Carbon footprint per capita	Tonnes CO2 eq per capita/year	0.9	1.1	1.3	1.4	1.6	**2.2**
Air emissions	Air quality index for Colombo Metro	Number	Not available	Not available	Not available	Not available	Not available	**57.5**
	Air quality index for Kandy City	Number	Not available	Not available	Not available	Not available	Not available	**50.0**
Water	Water use (total)	Teraliters per year	9.8	13.0	13.0	13.0	13.0	**12.9**
	Percentage of population with access to potable water	%	Not available	Not available	Not available	Not available	90%	**92%**
	Percentage of total ground water level and quality samples below desired standards	%	Not available	Not available	Not available	Not available	Not available	Not available
Waste	Total solid commercial and industrial waste generation	Kilotonnes per year	Not available	Not available	Not available	Not available	Not available	**Not available**
	Total hazardous waste generation	Tonnes per year	Not available	Not available	Not available	22,000	Not available	**35,000**
	Total hazardous waste generation per capita	kg per capita/year	Not available	Not available	Not available	1.10	Not available	**1.62**
	National food loss index	%	Not available	Not available	Not available	Not available	Not available	Not available

Topic	Indicator	Unit	Values for Sri Lanka					
			1990	1995	2000	2005	2010	2015
Biodiversity	Total forest cover in Sri Lanka	%	36.4%	35.7%	35.0%	33.8%	29.7%	**29.0%**
	Total use of pesticides and herbicides	Tonnes per year	Not available	Not available	5,120 (yr 2003)	7,940	6,588	**7,200**
Mobility	Share of public transport mode in mobility	%	Not available	Not available	Not available	Not available	Not available	**48%**
	Percentage of population with good access and availability to public transportation	%	Not available	Not available	Not available	Not available	Not available	**75%**
	Percentage of consumers using public transportation for more than 80% of their travels	%	n/a	n/a	n/a	n/a	n/a	**83%**
Consumer awareness	Percentage of consumers with awareness on available green products (e.g. organic or eco-labelled products)	%	n/a	n/a	n/a	n/a	n/a	**32%**
	Percentage of consumers with awareness on the benefits of using local products	%	n/a	n/a	n/a	n/a	n/a	**51%**
	Percentage of consumers with awareness to reduce wasteful consumption	%	n/a	n/a	n/a	n/a	n/a	**57%**
	Percentage of consumers with awareness on the environmental impacts of product packaging	%	n/a	n/a	n/a	n/a	n/a	**47%**
Consumer behaviour	Percentage of consumers willing to pay up to 10% more for a green product (e.g. organic or eco-labelled)	%	n/a	n/a	n/a	n/a	n/a	**59%**
Policy & regulations	Number of product categories included in the Sri Lankan Green Public Procurement system	Number of product categories	0	0	0	0	0	**0**
Research and development	Expenditure on R&D for sustainable consumption and production and environmentally sound technologies	Sri Lankan rupees per year	Not available	Not available	Not available	Not available	Not available	Not available
International standards	Number of factories with certified environmental management system in place (e.g. ISO 14001)	Total number of factories per year	Not available	Not available	5	87	112	**>125**
	Number of factories with certified food safety management system in place (e.g. ISO 22000)	Total number of factories per year	Not available	Not available	Not available	Not available	Not available	**525**
	Number of factories with certified energy management system in place (e.g. ISO 50001)	Total number of factories per year	Not available	Not available	Not available	Not available	Not available	**<20**
Human development	Human Development Index (HDI)	Number	0.62	0.70	0.68	0.74	0.76	**0.76**
	Gini Index (measure of income distribution in a nation)	Number	0.47	0.46	0.47	0.47	0.48	**0.48 (2013)**
Knowledge & education	Number of school education institutions which have clearly incorporated SCP topics in their courses	Number of institutions	0	0	0	0	0	**0**
	Number of universities which have clearly incorporated SCP topics in their courses	Number of institutions	0	0	1	3	8	**11**
	Number of vocational education institutions which have clearly incorporated SCP topics in their courses	Number of institutions	0	0	0	0	0	**0**
	Number of professional education institutions which have clearly incorporated SCP topics in their courses	Number of institutions	0	0	0	1	2	**2**

6.4. International benchmarking of national indicators

Our current consumption and production patterns are clearly unsustainable. The Global Footprint Network notes that today the quantity of resources that we consume globally and the waste that we generate require the equivalent of 1.5 planets[15]. This means that it takes the Earth one year and six months to regenerate what we use in a year. In other words, we are facing an "ecological overshoot situation"[16]. Our ecological footprint has been consistently increasing. The figure below shows that the consumption patterns are not equal across the globe. Of course, the highly industrialised and developed countries (e.g. Europe, North America, and Australia) consume significantly more than transition and developing countries in South America, Africa and large parts of Asia. However, consumption and production patterns are increasing rapidly in transition economies due to their growing middle class consumers and associated demands for supporting services and infrastructure, including China, India but also Sri Lanka.

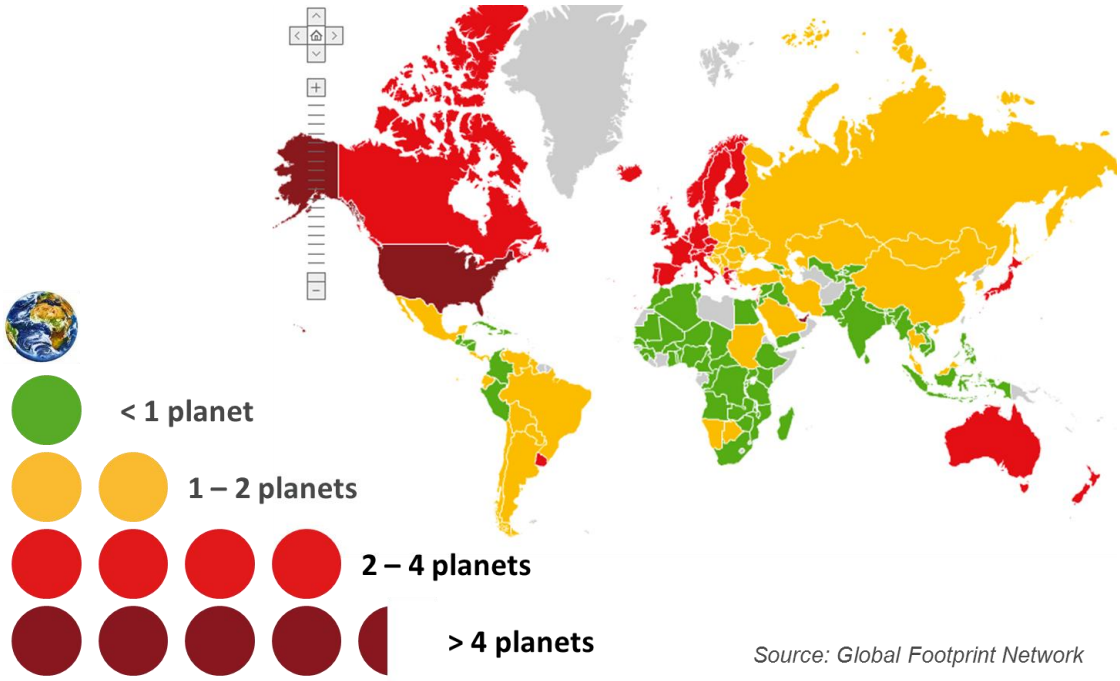


Figure 9: Consumption trends: Does a better life require more than one planet?[17]

To put Sri Lanka's baseline into an international perspective, Table 11 provides a comparative assessment of selected Sri Lanka's indicators against the Asia Pacific overall and selected Asian countries in different stages of development and contexts (e.g. India, China, Philippines, Japan and Singapore). This analysis is based on the Asia Pacific database on SCP indicators developed by UNEP as part of the EU funded SWITCH Asia Program[18].

Overall, the wide range of efficiencies in Table 11 indicates a huge potential for improvement for the Asia Pacific, including Sri Lanka and other countries.

In most cases (material energy, carbon footprint per capita and GDP), Sri Lanka compares favourable against the Asia Pacific average. However, it is noted that these figures will change based on the anticipated economic growth of Sri Lanka and associated increasing material, energy, water

15 Global Footprint Network: Footprint Basics. www.footprintnetwork.org/en/index.php/GFN/page/footprint_basics_overview/.

16 WWF (2012). Living Planet Report 2012. Eds. Natasja Oerlemans. WWF International, Gland, Switzerland.

17 WWF, One Planet Living, www.oneplanetliving.net.

18 www.switch-asia.eu/news/switch-asia-and-uneps-asia-pacific-indicators-for-sustainable-consumption-and-production-featured/

consumption patterns. For example, the material/energy/carbon footprints per GDP and capita for India and China are significantly higher due their rapid (and less sustainable) development pathways to date.

The share of renewable energy in total primary energy supply in Sri Lanka (52%) is significantly higher than the Asia Pacific average of 14%. This illustrates that learnings from SCP related experiences should be "symbiotic", meaning that Sri Lanka can learn from other countries but surely also the visa versa.

Illustrative samples of visual presentations comparing SCP indicator values are provided in the following figures. These figures are based on a booklet of infographics on Resource use in the Asia-Pacific (UNEP, 2015). Further illustrations on resource uses in the Asia Pacific are provided in this booklet.

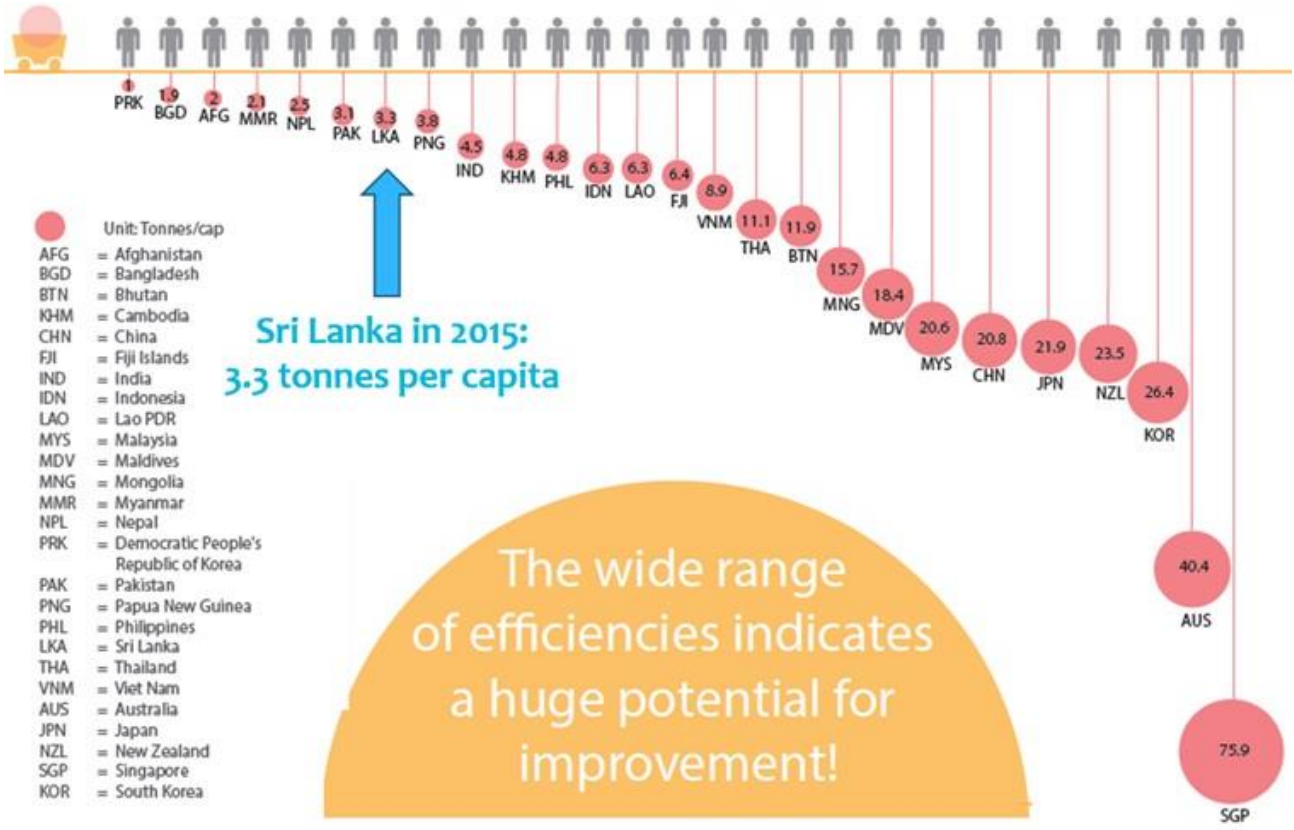


Figure 10: International benchmarking of material footprint per capita[19]

19 Graph extracted from UNEP (2015), Resource use in the Asia-Pacific - A booklet of infographics, United Nations Environment Programme, Bangkok.

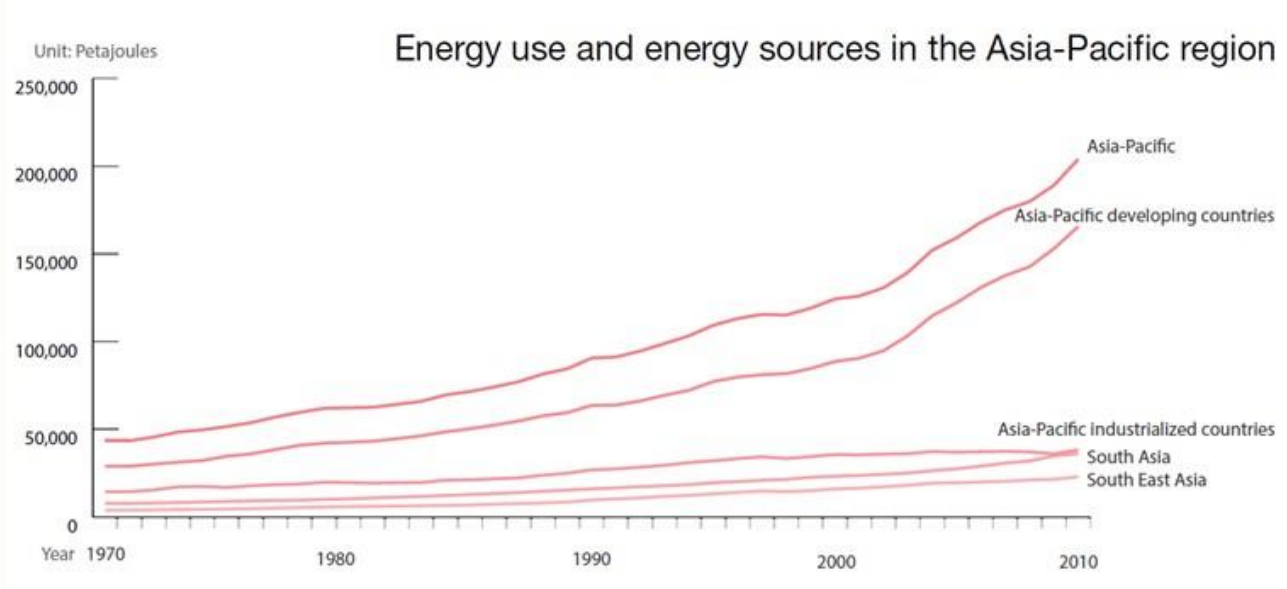


Figure 11: Energy use in the Asia Pacific region[20]

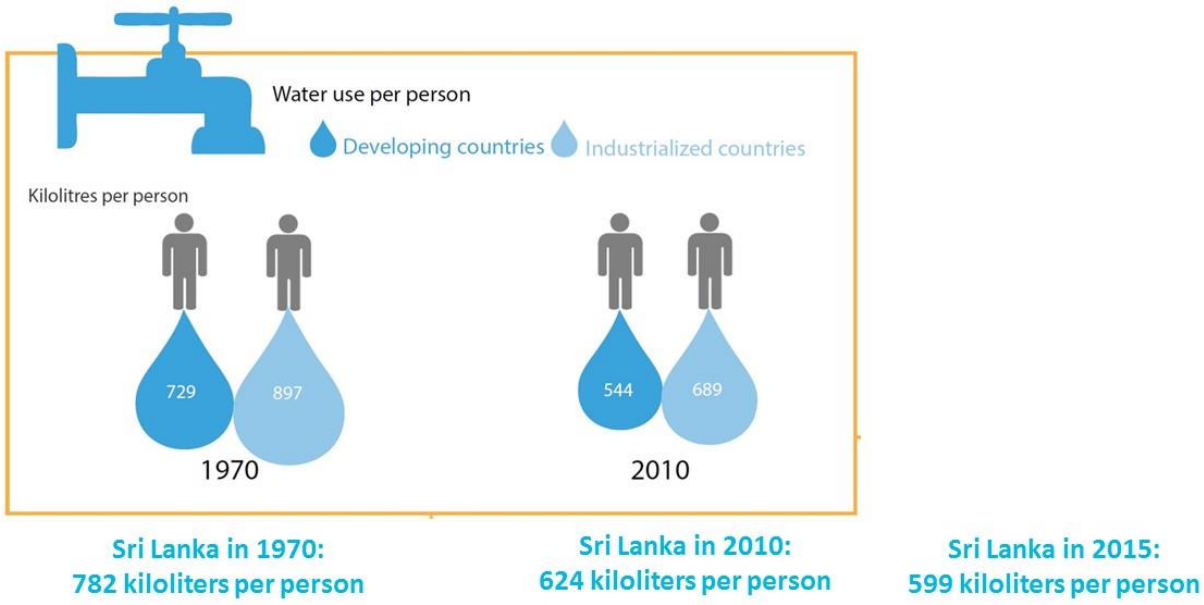


Figure 12: International benchmarking of water use per capita[21]

20 Graph extracted from UNEP (2015), Resource use in the Asia-Pacific - A booklet of infographics, United Nations Environment Programme, Bangkok.

21 Graph extracted from UNEP (2015), Resource use in the Asia-Pacific - A booklet of infographics, United Nations Environment Programme, Bangkok.

Table 11: International benchmarking of Sri Lanka SCP indicators

Topic	Indicator	Unit	2015 values - UNEP SWITCH Indicator Database (March 2016)						
			Sri Lanka	**Asia Pacific**	**India**	**China**	**Philippines**	**Japan**	**Singapore**
Material use	Material footprint per GDP	kg per US$ GDP	**1.5**	2.8	3.4	5.2	2.8	0.6	2.1
	Material footprint per capita	Tonnes per capita/year	**3.3**	11.6	4.5	20.8	4.8	20.9	75.9
	Domestic Material Consumption per GDP	kg per US$ GDP	**2.3**	3.1	4.0	6.1	2.7	0.3	1.1
	Domestic Material Consumption per capita	Tonnes per capita/year	**4.9**	12.9	5.3	24.4	4.7	9.7	39.0
Energy	Energy footprint per GDP	Megajoules per US$ GDP	**9.2**	12.6	16.5	19.5	12.2	5.0	13.5
	Share of renewable energy in total primary energy supply	%	**52%**	14%	28%	10%	40%	2%	2%
Greenhouse gas emissions	Carbon footprint per GDP	kg CO2 eq per US$ GDP	**1.0**	1.7	2.6	2.8	1.7	0.5	1.2
Water	Total water use per GDP	Liters per US$ GDP	**276**	129	451	98	463	18	11
	Total water use per capita	kiloliters per capita/year	**599**	532	593	395	801	693	411
Waste	Percentage of municipal solid waste recycled	%	**17%**	22%	<2%	Not available	12%	21%	59%
Economic	GDP per capita	US$ per capita	**2,173**	4,137	1,315	4,032	1,731	37,856	36,803
Human development	Human Development Index (HDI)	Number	**0.76**	n/a	0.61	0.73	0.67	0.89	0.91
	Gini Index	Number	**39.2 (yr. 2012)**	n/a	35.1 (yr. 2011)	42.2 (yr. 2012)	43.0 (yr. 2012)	32.8 (yr. 2008)	41.2 (yr. 2014)

6.5. Development of SCP monitoring plan(s) for Sri Lanka

After agreement on types of national indicators and their baseline values, a key next step is to discuss and agree on national targets for the SCP indicators and implement a practical and result-oriented monitoring system. It is noted that the method(s) for SCP monitoring will depend on policy priorities and existing institutional and inter-ministerial arrangements. It is of key importance to consider and build upon existing monitoring systems where possible and undertake this process through a multi-stakeholder approach with relevant public and private sector agencies (e.g. Ministry of National Policies and Economic Affairs, Ministry of Wildlife and Sustainable Development, agencies in dairy, tea and rice processing sub-sectors).

A principle framework for a SCP indicator monitoring system is provided in the table below, including basic monitoring elements such as historical figures, current baseline, future targets, and actions to meet or advance on the targets set for the SCP indicators.

Table 12: Potential principle framework of SCP monitoring system – subject to further work and stakeholder discussions

Topic	Indicator	Unit	The past		Current	Future targets		Actions and initiatives to meet or advance on targets			
			19…	20..	2015	2020	2030	Implementation mechanism (How)	Key responsible (Who)	Timing (When)	Progress note
Headline indicators											
Material use	Material footprint (Total)										
	Material footprint per GDP										
Etc	Etc										
First priority priorities											
Material use	Domestic Material Consumption (Total)										
	Domestic Material Consumption per GDP										
	Domestic Material Consumption per capita										
Etc	Etc										

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

The conclusions from this baseline and awareness assessment are as follows:

- *Current situation on SCP indicators and monitoring:* There are currently no integrated or formalised monitoring schemes for SCP in place at national or sub-sectoral level. At the moment individual institutions develop and monitor their own indicators (e.g. energy, water, waste, greenhouse gas emissions, sub-sectoral specific parameters). Given the increasing importance of SCP-related issues and the SDGs, there is a clear need for integrated monitoring solutions.
- *International experiences:* Many countries have strategies and indicators covering SCP. As demonstrated throughout this baseline report, there are opportunities for Sri Lanka to learn from international experiences and data sets (e.g. UNEP work on SCP indicators as part Regional SWITCH Asia Component). However, the review of international experiences shows that there is no “one size fits all” solution for national SCP indicators and monitoring.
- *Consumer survey:* The survey undertaken with a sample of 500 people in Sri Lanka showed that about half of consumers have no or low awareness on SCP related issues, with awareness to reduce wasteful consumption the highest (58%) and awareness on green products the lowest (32%). People with higher income have overall higher awareness, and willing to pay a higher price for green products. However, people with higher income use less public transport. As expected, low income groups were reluctant to pay extra for green products. Most of the purchases seem to be based on price, quality and expiry date. Less attention seems to be paid to health or environmental issues in consumer purchasing decisions. When asked about the SCP priorities to be addressed in Sri Lanka, responsible use, reduction, and disposal of resources (materials, waste, water) ranked as highest priority while energy efficiency, green products, and people’s lifestyles were not in the top three priorities of consumers.
- *Production surveys in sub-sectors:* Overall, the tea sector shows higher awareness on SCP topics than rice and dairy processing sectors. This can be explained by export-driven market of the Sri Lanka tea sector. All three sectors have good awareness on consumer protection/health and cleaner production. Climate change, carbon footprint and associated business opportunities scored lowest on awareness. Certified management systems on food safety, environment, energy, and OH&S have received no or little attention in rice and dairy processing to date. Implementation of certified management system is higher in tea sector because of international requirements, including Rain Forrest Alliance. When factories were asked about their need for policy and sectoral support on SCP, technologies, capacity building, international good practices and green finance were rated as a highest priority. For tea sector, higher identified need for support on green products (e.g. increase demands, support export). Sri Lankan tea sector seems to have favourable performance against international benchmarks. There is a need for further international data to benchmark specific products in Sri Lankan rice and dairy processing sectors. Many companies do not have proper data systems to understand and monitor their SCP performance.
- *National SCP indicators:* The proposed SCP indicators for Sri Lanka can play a key role for monitoring progress towards the country’s SCP objectives, monitoring trends in areas of key relevance to SCP, benchmarking with patterns of consumption and production in other countries, and raising awareness of the importance of SCP and to improve accountability. The development and implementation of SCP indicators is not a “one-off” exercise, but rather a process of continuous learning and adaption to evolving SCP priorities and circumstances over time. The success factors for (SCP) indicators should be carefully considered as part of the ongoing efforts on this topic (e.g. reflect a widely recognised concern, data reliability and availability, and SMART[22]).
- *SCP monitoring and targets:* The scope and methods for the SCP indicators and subsequent monitoring depend on evolving policy priorities and existing institutional and inter-ministerial arrangements. A key next step in the SCP indicator process is to discuss and agree on national targets for selected SCP indicators and implement a practical and result-oriented monitoring system (or integrate into existing system(s) where possible).

[22] Specific, Measurable, Attainable, Relevant, Timebound (SMART).

- *Multi-stakeholder processes:* Follow-up processes on the proposed SCP indicators and subsequent monitoring should be undertaken through multi-stakeholder approaches with relevant public and private sector agencies (e.g. Ministry of National Policies and Economic Affairs, Ministry of Wildlife and Sustainable Development, agencies in dairy, tea and rice processing sub-sectors).
- *Integration of SCP indicators:* Key national and international agreements are closely linked to the proposed national SCP indicators, including the Sustainable Development Goals (SDGs), Nationally Appropriate Mitigation Actions (NAMA), Intended Nationally Determined Contributions (INDC)). Careful consideration should be given to the integration with these initiatives.
- *Creating ownership:* The SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka assists with scoping, developing and piloting SCP policy instruments customised to the needs of Sri Lanka. Building upon the results from the baseline assessment (e.g. consumer surveys, production surveys in three sub-sectors, national SCP indicators), continued efforts are required to create long-term ownership by relevant institutions and sustain processes and implementation over time.

7.2. Recommendations and next steps

The key recommendations and next steps from this baseline and awareness assessment are summarised in the table below. The SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka will coordinate further discussions and follow-up from these recommendations.

Table 13: Recommendations and next steps – subject to further stakeholder discussions

Topic	Potential lead (to be confirmed)	Proposed recommendation and next step
Sustainable consumption and consumer awareness	Ministry of Mahaweli Development and Environment Consumer Affairs Authority	Based on the results from the consumer survey presented in this report, undertake targeted communication and awareness raising campaign(s) to improve consumer awareness on sustainable consumption and production, and thereby support behaviour changes towards more sustainable consumption.
	Ministry of National Policies and Economic Affairs	Take into account the top priorities identified by consumers interviewed as part of the survey in national level consumer and SCP related development programs. These top SCP priorities include: • Sustainable and responsible use of natural resources. • Increase education and awareness on environmental and sustainability issues. • Increase water efficiency and reduce water wastage. • Better waste reuse, recycling and disposal. • Improve availability and access to public transport.
	Sri Lanka Standards Institute Consumer Affairs Authority	Investigate opportunities, challenges and implementation pathways to increase visibility, marketing, standardisation, and affordability of available green products in Sri Lanka, and thereby enable consumers in selection of green products
	Department of Census and Statistics Consumer Affairs Authority	Building upon the survey carried as part of this SCP baseline assessment, investigate potential and means to integrate SCP related questions into existing national level consumer surveys
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Subject to stakeholder interests, undertake further co-relation and statistical analysis on the survey results for the different geographical and demographical groups of consumers in order to meet specific needs of government initiatives.

Topic	Potential lead (to be confirmed)	Proposed recommendation and next step
Sustainable production in three sub-sectors (dairy, tea and rice processing)	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Undertake efforts to include more large dairy processing factories in the sustainable production survey to have a more representative sampling of the large factories in the dairy sector.
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Undertake a targeted capacity building and training program for industry sectors on the relevant SCP concepts and associated business opportunities for Sri Lanka businesses. In these capacity building efforts, pay special attention on increasing business awareness on climate change and green products because production surveys undertaken showed that awareness on these two topics is low.
	Ministry of National Policies and Economic Affairs	Investigate means to streamline data collection, management, and reporting amongst Sri Lanka business for better process control, sharing learnings and sectoral monitoring.
	Department of Animal Production and Health Institute of Post-Harvest Technologies	Assess opportunities to increase government support towards green technologies transfer for dairy and rice processing industries. These two sub-sectors are currently constrained by outdated and resource-inefficient technologies.
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Further utilise and build upon the database with factory inputs and output data developed with the aim to provide additional services and SCP policy support to dairy, tea and rice processing factories. Opportunities include: • Identification of factories which perform under the benchmarks developed for material use, energy, water and wastes. • Sharing experiences and benchmark performance in the sub-sectors through detailed analysis of factory inputs, outputs and their correlations.
National SCP indicators and monitoring	Ministry of Mahaweli Development and Environment	Coordinate multi-stakeholder process to discuss and agree on national targets for selected SCP indicators and implement a practical and result-oriented monitoring system. • Careful consideration should be given to desired level of integration with key related initiatives such as SDGs, NAMA, and INDC. • Specific attention should be paid to create synergies and partnerships with the Ministry of National Policies and Economic Affairs, Ministry of Wildlife and Sustainable Development, and specialised agencies (e.g. dairy / tea / rice processing, energy, water).
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Continue consultations and find solutions to create long-term ownership with relevant national institutions on SCP indicators, monitoring processes and implementation.
	SWITCH-Asia Sustainable Consumption & Production National Policy Support Component Sri Lanka Project	Consider the delivery of capacity building with relevant national agencies on SCP indicators, focusing on the development and quantification of indicators and implementation of integrated monitoring systems.

Appendices

APPENDIX 1: IDENTIFICATION AND PRIORITISATION OF SCP INDICATORS

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Air emissions	SP	Greenhouse gas emissions (scope 1 and 2), per capita	Tonnes per capita	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Air emissions	SP	Greenhouse gas emissions (scope 1 and 2), total	Kilotonnes	Yes	Yes	Yes	Yes	Yes	High	High	High	High	1st priority	1st priority	1st priority	1st priority
Biodiversity	SCP	Hectares of new land acquired for development	Hectares in given year	Yes	Yes	Yes	Maybe	Yes	High	Low	Low	Low	1st priority			
Biodiversity	SCP	National biodiversity index (TBC)	TBC	Yes	Yes	Yes	Yes	Yes	High	High	High	High	2nd priority			
Biodiversity	SCP	Pesticides use, total	tonnes per year	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Business awareness	SP	Percentage of surveyed companies with awareness on sustainable consumption and production	%	Maybe	Yes	Maybe	Maybe	Maybe	High	High	High	High		1st priority	1st priority	1st priority
Business awareness	SP	Percentage of surveyed companies with awareness on resource efficient and cleaner production	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High		1st priority	1st priority	1st priority
Business awareness	SP	Percentage of surveyed companies with awareness on sustainable development, including associated business opportunities	%	No	Yes	Maybe	Maybe	Maybe	High	High	High	High				
Business awareness	SP	Percentage of surveyed companies with awareness on life cycle thinking, including associated business opportunities	%	Maybe	Maybe	Yes	Maybe	Maybe	High	High	High	High				
Business awareness	SP	Percentage of surveyed companies with awareness on climate change	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High		1st priority	1st priority	1st priority
Business awareness	SP	Percentage of surveyed companies with awareness on resource limitations	%	Maybe	Yes	Yes	Maybe	Yes	High	High	High	High				
Business awareness	SP	Percentage of surveyed companies with awareness on wasteful consumption	%	Maybe	Yes	Yes	Maybe	Yes	High	High	High	High				
Business awareness	SP	Percentage of surveyed companies with awareness on responsible use of natural resources	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High				
Business awareness	SP	Percentage of surveyed companies with awareness on green products (e.g. organic and eco-labelled products)	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High		1st priority	1st priority	1st priority
Business awareness	SP	Percentage of surveyed companies with awareness on the effect of dietary shift away from animal based food products	%	Maybe	Maybe	Yes	Maybe	Yes	Medium	Medium	Low	Low				

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Business awareness	SP	Percentage of surveyed companies with awareness on the wider benefit of using local products	%	Maybe	Maybe	Yes	Maybe	Maybe	Medium	Medium	Medium	Medium				
Business awareness	SP	Percentage of surveyed companies with awareness on end of product life effects and possibility of reuse, recycle and recovery	%	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium				
Business awareness	SP	Percentage of surveyed companies with awareness on innovative consumption solutions (focusing on product functionality and utility)	%	Maybe	Yes	Yes	Yes	Maybe	High	Low	Low	Low				
Business awareness	SP	Percentage of surveyed companies with awareness on collaborative consumption	%	Maybe	Maybe	Yes	Maybe	Maybe	High	Low	Low	Low				
Business awareness	SP	Percentage of surveyed companies with awareness on biodiversity	%	Maybe	Yes	Yes	Maybe	Maybe	High	High	High	High		2nd priority	2nd priority	2nd priority
Business awareness	SP	Percentage of surveyed companies with awareness on consumer protection & health	%	Yes	Yes	Yes	Maybe	Yes	High	High	High	High		1st priority	1st priority	1st priority
Business awareness	SP	Percentage of surveyed companies with awareness on consumer rights	%	Yes	Yes	Yes	Maybe	Yes	High	Medium	Medium	Medium				
Business awareness	SP	Percentage of surveyed companies with awareness on independently verified eco-labelling schemes	%	Yes	Maybe	Yes	Yes	Yes	Medium	Medium	Medium	Medium		2nd priority	2nd priority	2nd priority
Business awareness	SP	Percentage of surveyed companies with awareness on green building and housing e.g. (natural lighting, ventilation)	%	Maybe	Yes	Yes	Maybe	Maybe	High	Medium	Medium	Medium				
Business awareness	SP	Percentage of surveyed companies with awareness on low carbon mobility	%	No	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium				
Connectivity	SC	Percentage of population with access to water	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Connectivity	SC	Percentage of population with access to electricity	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Connectivity	SC	Percentage of population with access to waste collection	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Connectivity	SC	Share of public transport mode in mobility	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Connectivity	SC	Percentage of population with good accees and availability to public transporation	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Connectivity	SCP	Access to schools	%	Yes	Yes	Yes	Yes	Yes	Low	Low	Low	Low				

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Consumer awareness	SC	Percentage of surveyed consumers with awareness on the sustainable use, recycling and disposal of products	%	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Consumer awareness	SC	Percentage of surveyed consumers with awareness on available green products (e.g. organic or eco-labelled products)	%	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Consumer awareness	SC	Percentage of surveyed consumers with awareness on alternative green products	%	No	Yes	Yes	Maybe	Maybe	High	Medium	Medium	Medium				
Consumer awareness	SC	Percentage of surveyed consumers with awareness on the benefits of using local products	%	Maybe	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Consumer awareness	SC	Percentage of surveyed consumers with awareness on the positive effects of dietary shift away from animal based food products	%	Maybe	Maybe	Yes	Yes	Yes	High	Medium	Low	Low				
Consumer awareness	SC	Percentage of surveyed consumers with awareness on end of product life effects and possibility of reuse, recycle and recovery	%	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium				
Consumer awareness	SC	Percentage of surveyed consumers with awareness on life cycle thinking of products and services	%	No	Maybe	Yes	Maybe	Maybe	Medium	Medium	Medium	Medium				
Consumer awareness	SC	Percentage of surveyed consumers with awareness to reduce wasteful consumption	%	Maybe	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Consumer awareness	SC	Percentage of surveyed consumers with awareness on responsible use of products	%	Maybe	Yes	Maybe	Maybe	Maybe	High	Medium	Medium	Medium				
Consumer awareness	SC	Percentage of surveyed consumers with awareness on available independently verified eco-labelling schemes	%	Yes	Maybe	Yes	Yes	Yes	High	Medium	Medium	Medium				
Consumer awareness	SC	Percentage of surveyed consumers with awareness on safe and efficient use of the products	%	Maybe	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium				
Consumer awareness	SC	Percentage of surveyed consumers with awareness on the environmental impacts of product packaging	%	Yes	No	Yes	Maybe	Yes	High	Medium	Low	Low	1st priority			
Consumer behaviour	SC	Percentage of surveyed consumers willing to pay up to 10% more for a green product (e.g. organic or eco-labelled)	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High	1st priority	2nd priority		2nd priority

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Consumer behaviour	SC	Percentage of surveyed consumers which claim not to be effected by product appearance in their purchasing decisions	%	Yes	Maybe	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority	2nd priority	2nd priority	2nd priority
Consumer behaviour	SC	Percentage of surveyed consumers using public transportation for more than 80% of their travels	%	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Consumer behaviour	SC	Percentage of surveyed consumers which are influenced by culture in their consumption practices	%	No	Maybe	Yes	Yes	Yes	Medium	Medium	Medium	Medium				
Consumer behaviour	SC	Indicator on consumption versus income level (TBC)	TBC	Maybe	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Economic and human development	SC	Percentage of population with low income	%	Yes	Yes	Yes	No	Yes	High	Low	Low	Low				
Economic and human development	SC	Percentage of population with medium income	%	Yes	Yes	Yes	No	Yes	High	Low	Low	Low				
Economic and human development	SC	Percentage of population with high income	%	Yes	Yes	Yes	No	Yes	High	Low	Low	Low				
Energy use	SP	Energy consumption, per GDP	Kilojoules per GDP	Yes	Yes	Yes	Yes	Yes	High	High	High	High	1st priority			
Energy use	SP	Electricity consumption, per weight of product	Kilojoules per kg of product	Yes	Yes	Yes	Yes	Yes	High	High	High	High		1st priority	1st priority	1st priority
Energy use	SP	Fossil fuel consumption, total	Kilojoules per year	Yes	Yes	Yes	Yes	Yes	High	High	High	High	2nd priority	1st priority	1st priority	2nd priority
Energy use	SP	Biomass fuel consumption, total	Kilojoules per year	Yes	Yes	Yes	Yes	Yes	High	High	High	High	2nd priority	1st priority	1st priority	1st priority
Finance	SP	Expenditure on R&D on environmentally sound technologies	Sri Lankan rupees per year	Yes	Maybe	No	Yes	Yes	High	Medium	Medium	Medium				
Finance	SP	Investments in environmentally sound technologies and processes	Sri Lankan rupees per year	Yes	Yes	Maybe	Yes	Yes	High	High	High	High				
Finance	SP	Share of green investment in relation to total investments	%	Yes	Yes	Maybe	Yes	Yes	High	High	High	High				
Finance	SP	Investments in renewable energy as % total energy investments	%	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Finance	SP	Green financial incentives distrbuted by government to industry that decouple growth per resource use	Sri Lankan rupees per year	Maybe	Yes	Yes	Yes	Yes	High	Medium	High	Medium	2nd priority			
Greening supply chains	SP	Value of locally produced products bought by consumers, total	Sri Lankan rupees per year	Yes	Maybe	No	Maybe	Maybe	Medium	Low	Low	Low				
Greening supply chains	SP	Expenditure on responsible and ethical advertising and green marketing	Sri Lankan rupees per year	No	No	No	Yes	Yes	Low	Low	Low	Low				
Health & safety	SP	Number of persons injured or killed in accidents in work place	Number of people per year	Yes	Yes	Yes	Yes	Yes	High	High	High	High	1st priority			

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Health & safety	SP	Percentage of time surveyed workers and community are exposed to high vibration levels from commercial/industrial activities	%	Maybe	Maybe	No	Yes	No	Low	Low	Low	Low				
Human development	SC	Gini Index (measure of income distribution in a nation)	Number	Maybe	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Human development	SC	Human Development Index (HDI)	Number	Maybe	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
International standards	SP	Number of companies with certified environmental management system in place (e.g. ISO 14001)	Total number of companies in given year	Yes	Maybe	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority	1st priority	1st priority	1st priority
International standards	SP	Number of companies with certified food safety management system in place (e.g. ISO 22000)	Total number of companies in given year	Yes	Yes	Yes	Yes	Yes	High	High	High	Medium	1st priority	1st priority	1st priority	1st priority
International standards	SP	Number of companies with certified energy management system in place (e.g. ISO 50001)	Total number of companies in given year	Yes	Yes	Yes	Yes	Yes	High	Medium	High	Medium	1st priority	1st priority	1st priority	1st priority
International standards	SP	Number of companies with certified occupational health and safety system in place (e.g. OHSAS)	Total number of companies in given year	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	High	1st priority	1st priority	1st priority	1st priority
Knowledge & education	SP	Number of courses which incorporated SCP provided by formal educational institutions (primary, secondary, tertiary)	Total number of study courses in given year	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low				
Knowledge & education	SP	No specific indicator identified, not applicable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Knowledge & education	SP	Number of adult educational institutions which have incorporated SCP in their courses	Total number of adult educational institutions in given year	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low				
Knowledge & education	SP	Number of teacher trainings which have incorporated SCP in their courses	Total number of teacher trainings in given year	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	2nd priority			
Material use	SP	Main raw material use, total	Kilotonnes per year	Yes	Yes	Yes	Yes	Yes	Low	High	High	High		1st priority	1st priority	1st priority
Material use	SP	Natural resource use, total	Kilotonnes per year	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	2nd priority			
Material use	SP	Natural resource use, per GDP	Kilotonnes per GDP	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Noise	SP	Percentage of time workers and community are exposed to high noise levels from commercial/industrial activities	%	No	Maybe	No	Yes	Yes	Medium	Low	Low	Medium				
Organizational readiness	SP	Percentage of surveyed companies applying of basic SCP and resource efficiency practices	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High				
Organizational readiness	SP	No specific indicator identified, not applicable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Organizational readiness	SP	Percentage of products from surveyed companies provide information to encourage consumers to apply SCP practices (use, recycling and disposal of product)?	%	Yes	Yes	No	Yes	Yes	High	Medium	Medium	Medium				
Organizational readiness	SP	No specific indicator identified, not applicable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Organizational readiness	SP	No specific indicator identified, not applicable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Packaging	SP	Percentage of packaging in final product sold to consumer, by weight	%	Yes	Yes	Yes	Yes	Yes	High	High	High	High		1st priority	1st priority	1st priority
Packaging	SP	Percentage of packaging in final product sold to consumer, by volume	%	Maybe	Yes	No	Maybe	Maybe	Low	High	High	High				
Packaging	SP	Percentage of packaging in final product sold to consumer, by value	%	No	Yes	Maybe	Yes	Maybe	Low	High	High	High				
Packaging	SP	Share of products produced with light packaging	%	Yes	Maybe	Maybe	Yes	Maybe	Low	High	High	High				
Packaging	SP	Share of products produced with bio-degradable packaging	%	Yes	Yes	Maybe	Yes	Maybe	High	High	High	High		1st priority	1st priority	1st priority
Packaging	SP	Share of products produced with recyclable packaging	%	Yes	Yes	Maybe	Yes	Maybe	High	High	High	High				
Policy & regulations	SP	Implementation of concrete government initiatives through SCP policies and action plans, total	Number of government initiatives in year	Maybe	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	2nd priority			
Policy & regulations	SP	Number of product categories included in the Sri Lankan Green Public Procurement system	Number of product categories	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	2nd priority			
Policy & regulations	SP	Number of instances of companies' non-compliances with environmental permit conditions	Number of non-compliances in a given year	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority			
Pollution	SP	Hazardous contaminants emitted to air, total	Kilotonnes per year	Maybe	Yes	No	Yes	Maybe	High	Low	Low	Low				
Pollution	SP	Hazardous contaminants emitted to water, total	Kilotonnes per year	Maybe	Yes	No	Yes	Maybe	High	Low	Low	Low				
Pollution	SP	Hazardous contaminants emitted to soil, total	Kilotonnes per year	Maybe	Yes	No	Yes	Maybe	High	Low	Low	Low				
Pollution	SP	Non-hazardous contaminants emitted to air, total	Kilotonnes per year	Maybe	Yes	No	Maybe	Maybe	Medium	Low	Low	Low				
Pollution	SP	Non-hazardous contaminants emitted to water, total	Kilotonnes per year	Maybe	Yes	No	Maybe	Maybe	Medium	Low	Low	Low				
Pollution	SP	Non-hazardous contaminants emitted to soil, total	Kilotonnes per year	Maybe	Yes	No	Maybe	Maybe	Medium	Low	Low	Low				
Production processes	SP	Number of local suppliers contracted by companies	Number of local suppliers	Yes	Maybe	Yes	Maybe	Maybe	Medium	High	High	Medium				
Products	SP	Value of products produced with eco-design principles	Sri Lankan rupees per year	Maybe	Maybe	No	Yes	Yes	Medium	Medium	Medium	Medium				

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Products	SP	Value of products produced which comply with independently verified eco-or organic labelling schemes	Sri Lankan rupees per year	Yes	Maybe	Yes	Yes	Yes	High	Medium	High	High		2nd priority	2nd priority	2nd priority
Products	SP	Number of green technology patents, total	Total number of existing patents in given year	Maybe	Maybe	No	Yes	Yes	High	Medium	Medium	Medium	2nd priority			
Renewable energy	SP	Share of renewable energy in total energy use	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Renewable energy	SP	Renewable energy use, total	Kilojoules per year	Yes	Yes	Yes	Maybe	Yes	High	Low	Low	Low	2nd priority			
Renewable energy	SP	Share of fossil fuel energy in total energy use	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low				
Reporting	SP	Number of companies which produce a report on sustainability or carbon foot printing	Total number of companies in given year	Yes	yes	Yes	Yes	Yes	High	Medium	Medium	Medium	2nd priority			
SDGs	SCP	Ozone Depleting Substance use, total	tonnes per year	Yes	Maybe	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
SDGs	SCP	CO2 intensity of building sector and new buildings	kg/m2/year	Maybe	Yes	No	Yes	Maybe	High	Low	Low	Low	2nd priority			
Waste management	SP	Percentage of raw material becoming waste during extraction or harvesting	%	Maybe	Maybe	Maybe	Yes	Maybe	Low	High	High	High				
Waste management	SP	Percentage of raw material becoming waste during pre-processing	%	Maybe	Maybe	Maybe	Yes	Maybe	Low	High	Low	Low				
Waste management	SP	Percentage of semi processed product becoming waste during processing	%	Maybe	Maybe	Maybe	Yes	Maybe	Low	High	High	High				
Waste management	SP	Percentage of finished product becoming waste during post-processing (e.g. logistics and retail)	%	Maybe	Maybe	Maybe	Yes	Maybe	Low	High	High	High				
Waste management	SP	Solid waste generation (commercial, industrial), total	Kilotonnes per year	Yes	Yes	Yes	Yes	Yes	High	Medium	Medium	Medium	1st priority	1st priority	1st priority	1st priority
Waste management	SC	Municipal Solid Waste generation, total	Kilotonnes per year	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Waste management	SC	Percentage of post-consumer waste recycled	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Waste management	SP	Amount of by-products used as raw material inputs	Kilotonnes per year	Maybe	Maybe	No	Maybe	Maybe	Low	Low	Low	Low				
Waste management	SP	Share of recyclable waste in total waste generation (commercial, industrial, household)	%	Maybe	Maybe	Maybe	Maybe	Maybe	Medium	Medium	Medium	Medium				
Waste management	SP	Percentage of organic wastes being used as energy feedstock or other uses	%	Yes	Yes	Yes	Yes	Yes	High	Low	Low	High	1st priority			1st priority
Waste management	SP	Waste water (industrial), total	m3 per year	Yes	Yes	Yes	Yes	Yes	High	High	Low	High	2nd priority	1st priority		1st priority

Domain / topic	SP, SC or SCP	Potential indicator based on SMART principles (Specific, Measureable, Attainable, Relevant and Timebound)	Potential indicator unit	Quality check questions for indicators (Yes / No / Maybe)					Relevance at national level or pilot subsectors?				Select for Sri Lanka SCP monitoring plan?			
				Easy to understand and communicate also to non-experts?	Reflect a widely recognised concern?	Can be based on available and reliable data and methods?	Assist in decision making on systemic transformation / innovation?	Possible to construct time-series to observe trends and detect short/medium-term changes?	National level	Dairy processing	Tea processing	Rice milling	National level	Dairy processing	Tea processing	Rice milling
Waste management	SCP	Total solid wastes being landfilled (households, commercial, industrial), per capita	Kilotonnes per capita	Yes	Yes	No	Yes	Yes	High	Low	Low	Low	2nd priority			
Waste management	SCP	Total hazardous waste generation, per GDP	Kilotonnes per GDP	Yes	Yes	Yes	Yes	Yes	High	Low	Low	Low	1st priority			
Wastewater	SP	Waste water (households and commercial), total	m3 per year	Yes	Yes	No	Yes	Yes	High	Low	Low	Low				
Water use	SP	Potable water use, total	m3 per year	Yes	Yes	Yes	Yes	Yes	High	High	Low	High	2nd priority			
Water use	SP	Total water use for industrial applications, total	m3 per year	Yes	Yes	Yes	Yes	Yes	High	High	Low	High	2nd priority	1st priority		1st priority
Water use	SP	Potable water use, per GDP	m3 per GDP	Yes	Yes	Yes	Yes	Yes	High	High	Low	High				
Water use	SP	Total water use for industrial applications, per GDP	m3 per GDP	Yes	Yes	No	Yes	Yes	High	High	Low	High	2nd priority			
Water use	SP	Percentage water reuse in industrial applications	%	Maybe	Maybe	No	Yes	Yes	High	Low	Low	Medium	No	No	No	No

APPENDIX 2: NATIONAL CONSUMER SURVEY

Objectives

The objectives of the national consumer survey are:

- To understand the present level of consumption patterns and sustainability awareness of Sri Lankan consumers.
- Collect data to support the baseline assessment on SCP awareness in Sri Lanka, including base lines of SC for pilot sub-sectors and national level so that future patterns of SC can be monitored and supported with SCP policy and non-policy interventions over a period of time.

Methodology

Target group	End consumers which purchase consumer products on a regular basis (at least once a month)
Criteria for selecting consumers for questionnaire	Statistical representative selection of consumers, including balanced mix of: • Consumers from all ages (starting at 16 years old) • Female and male consumers • Low, medium, and high income consumers • Different ethnic and religious groups • Marital status (e.g. single, married, divorced, widowed) • Consumers from urban, peri-urban and rural areas, covering as many different Sri Lankan provinces as possible • Consumers with diverse employments (e.g. private sector, government, self-employed, family caretaker, not employed) • Consumers with diverse educational background (e.g. primary, secondary, and tertiary)
Sampling numbers	500 consumers meeting the selection criteria above
Sampling technique	Cluster sampling, see targeted distribution of consumers in Figure 13 below https://en.wikipedia.org/wiki/Cluster_sampling
Key steps	• The questionnaires will need to be completed through bilateral and personal “face to face” interviews (not through telephone or electronic surveys) • The interviewer will approach consumers who seem to fit the profile outlined above at selected locations and timings • The interviewer will briefly introduce the questionnaire to consumer • The interviewer will go through questions outlined in the questionnaire and record answers from the consumer (on paper or electronically, subject to preferred working method of interviewer) • At end of the questionnaire, interviewer will thank consumer for time/input provided
Topics	• Basic information • Consumer awareness • Behaviour change • Factors influencing purchases • Sustainable consumption and production priorities
Data collection	• The contracted consultancy is responsible for entering the data from the completed questionnaires into a data collection spreadsheet • Questionnaire is not to be handed out to consumers • The template for the data collection spreadsheet will be provided by the two consultants undertaking the SCP baseline assessment (D van Beers and S Peiris).
Data processing	• The contracted consultancy is expected to organise and structure the data from the surveys to enable further processing. • The detailed processing of the collected data will be undertaken by the two consultants undertaking the SCP baseline assessment (D van Beers and S Peiris).

Questionnaire for consumers

Brief introduction to questionnaire – for enumerators

- This survey is undertaken as part of EU funded SWITCH Asia Program on Sustainable Consumption and Production (SCP). This program includes a National Policy Support Project in Sri Lanka.
- The objective of this survey is to gain a better understanding of the present levels of Sustainable Consumption (SC) patterns and awareness of Sri Lankan consumers.

Basic information – Enumerator judgement

Sex	☐ Female ☐ Male				
Estimated age (years)	☐ < 20	☐ 21 - 40		☐ 41 - 60	☐ > 60
Estimated income group	☐ Low income	☐ Middle income		☐ High income group	
Judged ethnic group	☐ Sinhala	☐ Tamil	☐ Muslims	☐ Burgher	☐ Other, please specify

Basic information – Consumer response

Place of residence	☐ Urban area		☐ Peri-urban area		☐ Rural area	
Name of closest town						
Marital status	☐ Single		☐ Married		☐ Divorced / Widowed	
Education	☐ No formal education		☐ Primary		☐ Secondary / Tertiary	
Employment	☐ Private sector	☐ Govern-ment	☐ Self-employed	☐ Family caretaker	☐ Not employed	☐ Other please specify:

Consumer awareness

How would you rate your awareness on the following issues related to consumer products (e.g. food, clothing, household electronics)?

Questions	Answers (please tick)				Example(s) needed to validate good or high awareness!
	1. Not aware at all	2. Some but low awareness	3. Good awareness	4. High awareness	
Efficient and responsible use, recycling and disposal of products	☐	☐	☐	☐	
Available green products (e.g. organic or eco-labelled products)	☐	☐	☐	☐	
Benefits of using local products	☐	☐	☐	☐	
The need to reduce wasteful consumption	☐	☐	☐	☐	
The environmental impacts of product packaging	☐	☐	☐	☐	
The environmental impacts of society's present way of consumption and production	☐	☐	☐	☐	

Behaviour change

Questions	Answers (please tick)				Example(s) and feedback provided
	1. Definite no	2. Likely not	3. Likely yes	4. Definite yes	
Would you be willing to pay up to 10% more for a green product? (e.g. organic or eco-labelled products)	☐	☐	☐	☐	
Would you consider to shift your food/eating habits to more non-meat products because of environmental and dietary benefits?	☐	☐	☐	☐	
Do you use public transportation for more than 80% of your travels?	☐	☐	☐	☐	
Do you have good access to public transport?	☐	☐	☐	☐	
Is adequate public transport available to your living area?	☐	☐	☐	☐	

Factors influencing purchases

What are the top three factors influencing your decisions in buying food and beverage products?

Items	Tick max three items	Why selected?
Product low price	☐	
Product quality	☐	
Brand	☐	
Positive and negative health impacts on consumer	☐	
Environmental impacts during production, use, and disposal	☐	
Product appearance (e.g. colour)	☐	
Product packaging (e.g. handy to carry, packaging material)	☐	
Product shell life (expiry date)	☐	
Other, please specify	☐	

SCP priorities

In your view, what are the top three priorities to be addressed and improved in Sri Lanka?

Category	Items	Tick max three items	Why selected?
Natural resources	Sustainable and responsible use of natural resources	☐	
Waste	Better waste reuse, recycling, and disposal	☐	
Energy	Increase energy efficiency and use of renewable energy	☐	
Water	Increase water efficiency and reduce water wastage	☐	

Category	Items	Tick max three items	Why selected?
Production	Increase cleaner and more resource efficient production at factories	☐	
Products	Increase development and marketing of green products (e.g. organic and eco-labelled products)	☐	
Education & awareness	Increase education and awareness on environmental and sustainability issues	☐	
Public buying	Increase government procurement of green products and services	☐	
Transport	Improve availability and access to public transport	☐	
Buildings	Increase energy efficiency of buildings	☐	
Lifestyles	Reduce environmental impacts of people's lifestyles	☐	
Other	Other, please specify	☐	

Closing questions

Any questions or remarks?		
Do you wish to be informed about the outcomes of this survey?	☐ Yes	☐ No
	Email (or postal) address:	

THANK YOU!

Enumerator and interview details

Interviewer name			
Interview date and time			
Interview location (see sampling figure)	☐ Urban area	☐ Peri-urban area	☐ Rural area
	Interview region:		
	Interview location:		
Additional notes			
Follow-up actions that may be required			

Proposed sampling

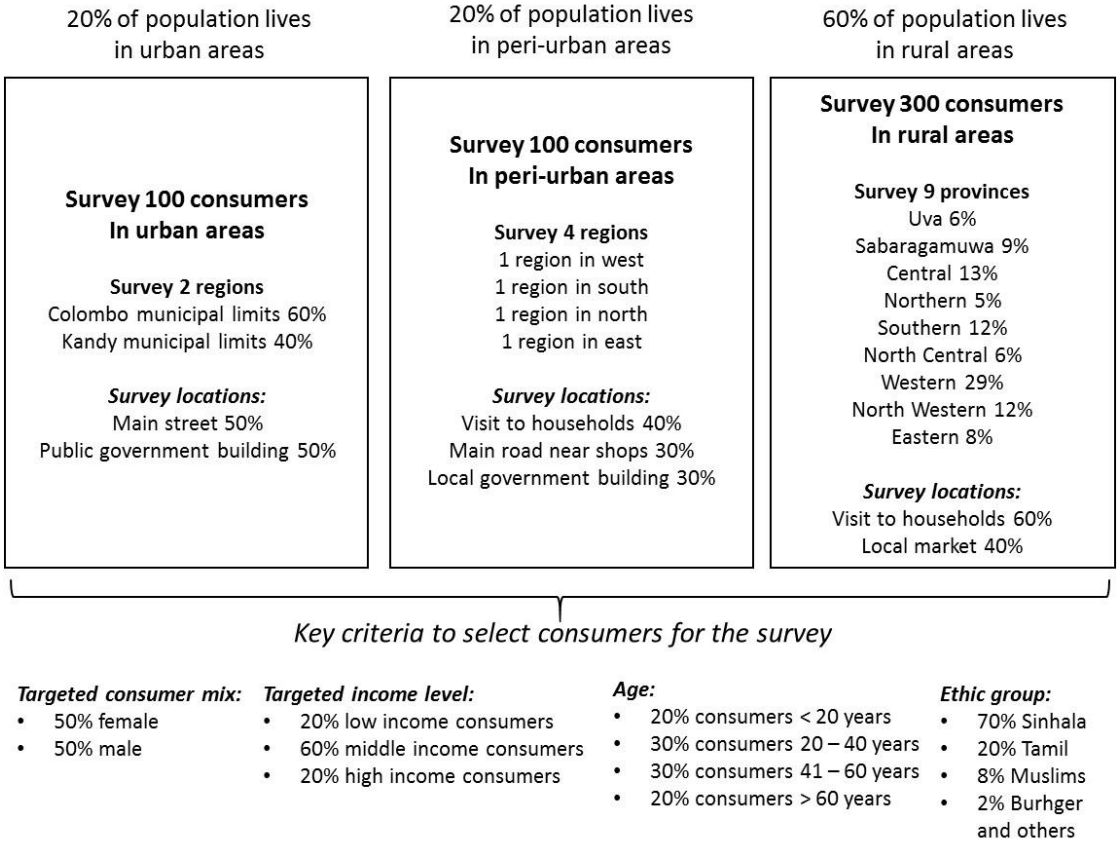


Figure 13: Proposed sampling for sustainable consumption surveys

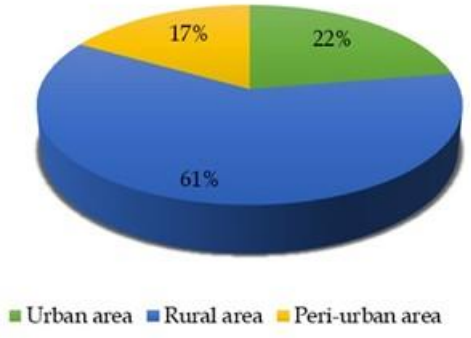
Achieved sampling

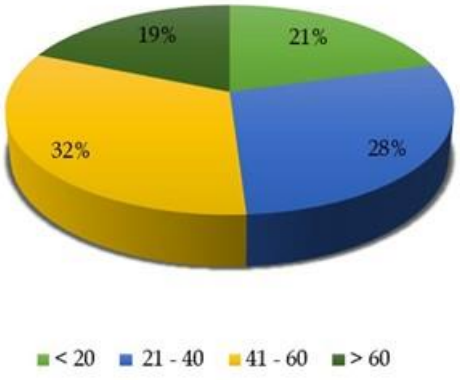
Consumers vs Area

Area	No
Urban area	112
Rural area	305
Peri-urban area	84

Consumers vs Age

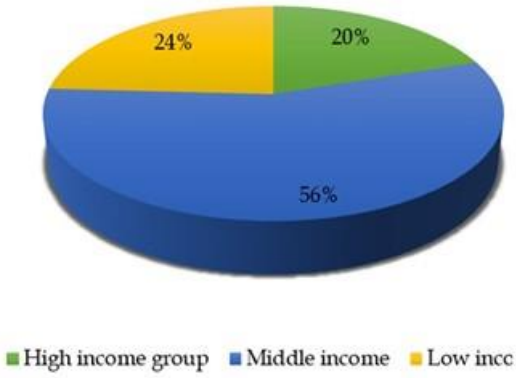
Age	No
< 20	101
20 - 40	140
41 - 60	159
> 60	92





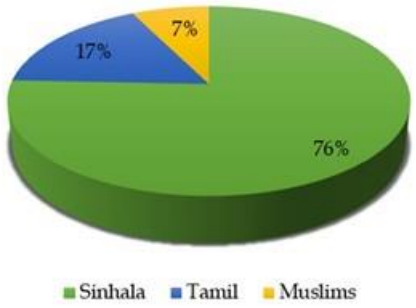
Consumers vs Income Group

Income Group	No
High income	99
Middle income	281
Low income	121



Consumers vs Ethnic Group

Ethnic Group	No
Sinhala	379
Tamil	85
Muslims	37



APPENDIX 3: SUB-SECTORAL PRODUCTION SURVEYS

Objectives

The objectives of the sub-sectoral production survey are:

- To understand the current penetration of Sustainable Production (SP) concepts in selected pilot sub-sectors (dairy, tea and rice processing) of the Food & Beverages Industry in Sri Lanka.
- Collect data to support the baseline assessment on SCP awareness in Sri Lanka, including base lines of SP for pilot sub-sectors and national level so that future patterns of SP can be monitored and supported with SCP policy and non-policy interventions over a period of time.

Methodology

Target group	Companies operating in Sri Lankan dairy, tea and rice processing subsectors
Criteria for selecting companies for questionnaire	Statistical representative selection of companies, including balanced mix of: • SMEs and large industries • Companies located in as many of different Sri Lankan provinces as possible • Dairy processing companies, covering liquid milk, milk powder, yoghurt, ice cream and other milk based products • Tea processing companies, covering black tea (orthodox, CTC) and green tea (orthodox, CTC) products • Rice processing companies, covering par boiled rice and raw rice products
Sampling numbers	• 30 companies for dairy processing (about 100% of total number of dairy companies in Sri Lanka) • 100 companies for tea processing (about 20% of total number of tea processing companies in Sri Lanka) • 100 companies for rice milling / processing (about 3% of total number of rice processing companies in Sri Lanka) • Respondent should be either Owner / Manager or a high level officer
Sampling technique	Cluster sampling, see targeted distribution of factories in selected sub-sectors in Figure 13 below
Key steps	• The questionnaire is to be completed through bilateral and personal “face to face” interview • The questionnaire should NOT be circulated to factory prior to the interview in order to avoid confusion and information overload. • The Sri Lanka NPSC project team will provide the selected consultant with database of factory contacts for the three subsectors (dairy, tea and rice processing). If needed, it is expected that the consultant will obtain additional factory contacts to meet the sampling requirements. • At the start of the interview, the interviewer will briefly introduce the questionnaire to factory. • Interviewer will go through questions outlined in the questionnaire and record answers from factory representative (on paper or electronically, subject to preferred working method of interviewer). • The questions on resource inputs and outputs can be introduced and explained during the interview with the factory. It will be the responsibility of the enumerator to collect required data to complete the questionnaire after the interview if such data was not readily available. • At the end of the questionnaire, the interviewer will thank the factory interviewed and ask if he/she would like to keep informed about the results of the questionnaire and baseline assessment. • The final version of the questionnaire may be translated into the local language if needed for the benefit of enumerators. • As a gratitude to the time spent by the factory interviewed, a detailed self-assessment checklist to identify feasible resource efficiency and

	sustainable production opportunities in the food and beverages sector is provided to the factory in the Appendix of this questionnaire. • After the interview, get the signature endorsement of the interviewee and / or take a picture of the factory building with company name as evidence of interview taken place. Pictures if taken, need to be submitted to project team.
Topic focus areas	• Basic information • SWITCH Project “Sustainable Production in Food & Beverages Industry” • Factory inputs • Factory outputs • Certification and eco-labelling • Awareness • Policy and sectoral support • Promoting good practices
Data collection	• The template for the data collection spreadsheet will be provided by the two consultants undertaking the SCP baseline assessment (Dick van Beers and Sena Peiris). • The contracted consultancy is responsible for entering the data from the completed questionnaires into a data collection spreadsheet.
Data processing	• The contracted consultancy is expected to organise and structure the data from the surveys to enable further processing. • The detailed processing of the collected data will be undertaken by the two consultants undertaking the SCP baseline assessment (Dick van Beers and Sena Peiris).

Questionnaire for factories in selected sub-sectors

Brief introduction to questionnaire – for enumerators

- This survey is undertaken as a part of EU funded SWITCH-Asia Sustainable Consumption and Production (SCP) National Policy Support Project in Sri Lanka.
- The objective of this survey is to gain a better understanding of the present level of Sustainable Production (SP) penetration in selected pilot sub-sectors (Dairy processing, Tea manufacturing & Rice milling) of the Food & Beverages Industry in Sri Lanka.
- Respondent should be either Owner / Manager or a high level officer.

- **Important note 1:** The results of this questionnaire will only be used for the purpose of the baseline assessment of the National SCP Policy Support Project. Specific results from participating companies will not be published without written consent from the factory.
- **Important note 2:** As a gratitude to the time spent by the factory interviewed, a detailed self-assessment checklist to identify feasible resource efficiency opportunities for the factory is provided to the factory in the Appendix of this questionnaire.

Basic information

Factory name					
Parent company (if applicable)					
Location	City:		District:		
Respondent's particulars	Name:				
	Position				
	Email:				
	Telephone:				
Markets:	Local/national: %		Export: %		
Sector	☐ Dairy processing		☐ Tea manufacturing		☐ Rice processing
Number of factory employees	☐ < 10	☐ 10 to 50	☐ 51 to 100	☐ 101 to 250	☐ >250

Sub-sector specific

Dairy processing	Products				
	☐ Liquid milk	☐ Milk powder	☐ Yoghurt	☐ Ice cream	☐ Other products, please specify:
Tea processing	Products				
	☐ Black tea (orthodox)	☐ Black tea (CTC)	☐ Green tea (Orthodox)	☐ Green tea (CTC)	☐ Other products, please specify:
	Ownership				
	☐ Regional Plantation Company		☐ Bought leaf	☐ Private	☐ Other, please specify
Rice milling	Products				
	☐ Par boiled rice	☐ Raw rice	☐ Other please specify:		
	Do you use rubber roller for de-husking?				
	☐ Yes	☐ No			

SWITCH Asia Project "Sustainable Production in the Food & Beverages Industry"

Did your factory get involved in the 1st phase of the SWITCH ASIA sustainable production projects? (e.g. project "Sustainable Production in the Food & Beverages Industry")	☐ Yes	☐ No
If yes, what benefits did your factory get as a result of this project?	☐ Cost savings ☐ Increased energy efficiency ☐ Increased water efficiency ☐ Increased material efficiency ☐ Waste reduction ☐ Capacity building and awareness ☐ Other, please specify	
Is your factory continuing the initiatives from this project?	☐ Yes	☐ No
If not, can you please describe why?	☐ Change of ownership or company management ☐ Lack of human resources (man empower) ☐ Lack of expertise and awareness ☐ Lack of financial benefits ☐ Technology challenges ☐ Lack of policy and regulatory support and incentives ☐ Economic feasibility and financial investment required ☐ Other, please specify	

Factory inputs

Questions	Quantity	Unit	Year (Jan – Dec)
Electricity consumption			
Electricity from national grid (CEB/LECO)		KWh	2015
Electricity generated on-site		KWh	2015
Fossil fuel consumption, other than for electricity generation			
Diesel		Liters	2015
Kerosene		Liters	2015
Furnace oil		Liters	2015
LP Gas		Kilograms	2015
Other, please specify			2015
Renewable energy consumption			
Solar		kWh	2015
Biomass – rice husk		Kilograms	2015
Biomass - others		Kilograms	2015
Biogas			2015
Hydro – own generation		kWh	2015
Other, please specify			2015
Water use			
Total water use		Cubic meters (kiloliters)	2015

Questions	Quantity	Unit	Year (Jan – Dec)
Raw materials use			
Dairy sector: Raw milk (Solid non-fat content of milk input > 7.5% and fat content > 3.5%)		Liters	2015
Dairy sector: Milk powder		Kilograms	2015
Rice sector: Paddy		Metric tonnes	2015
Tea sector: Green leaves		Kilograms	2015
Other, please specify			2015

Factory outputs

Questions	Quantity	Unit	Year
Product outputs – dairy processing			
Yoghurt		Kilograms	2015
Liquid milk		Kilograms	2015
Milk powder		Kilograms	2015
Ice cream		Kilograms	2015
Other milk products, please specify			2015
Percentage of reconstituted milk in total milk product output		%	2015
Product outputs – tea processing			
Made tea (Black orthodox + RV)		Kilograms	2015
Made tea (Black CTC)		Kilograms	2015
Other tea products, please specify		Kilograms	2015
Product outputs – rice processing			
Raw rice		Metric tonnes	2015
Parboiled rice		Metric tonnes	2015
Rice bran		Metric tonnes	2015
Broken rice		Metric tonnes	2015
Other rice products, please specify			2015
Non-product outputs			
Total solid process waste • Dairy: sweepings, rejects, contaminations, spillage, etc • Tea: refuse tea • Rice: husk, sweepings		Kilograms	2015
Ash from biomass		Kilograms	2015
Total waste water		Cubic meters (kiloliters)	2015
Ratios			
Percentage of products which comply with independently verified eco- or organic labelling schemes of total products		%	2015
Percentage of organic wastes being used as energy feedstock or other uses		%	2015

Questions	Quantity	Unit	Year
Percentage of products using bio-degradable packaging		%	2015
Dairy processing only: Percentage of products labelled with nutritional and ingredient information, including milk source (e.g. raw or powdered milk)		%	2015

Certification and eco-labelling

Questions	Answers (please tick)		Examples and feedback provided
	Yes	No	
Does your factory have a certified food safety management system in place (ISO 22000)?	☐	☐	
Does your factory have a certified environmental management system in place (e.g. ISO 14001)?	☐	☐	
Does your factory have a certified energy management system in place (e.g. ISO 50001)?	☐	☐	
Does your factory have a certified OH&S management system in place (e.g. OHSAS 18001)?	☐	☐	
Tea sector only: Does your factory have a certified Rain Forrest Alliance certification?	☐	☐	

Awareness

How would you rate your awareness on the following issues, and associated business opportunities?

Questions	Answers (please tick)				Example is needed to validate good or high awareness!
	1. Not aware at all	2. Some but low awareness	3. Good awareness	4. High awareness	
Resource efficiency • Energy, water, and material efficiency • Cleaner production	☐	☐	☐	☐	
Sustainable consumption and production • Life cycle thinking • Eco-innovation • Green supply chains • Green procurement • Green product design • Sustainable lifestyles	☐	☐	☐	☐	
Climate change and carbon footprint	☐	☐	☐	☐	
Green products (e.g. organic and eco-labelled products)	☐	☐	☐	☐	
Consumer protection and health	☐	☐	☐	☐	

Policy and sectoral support

What are key areas where your factory would benefit from policy and sectoral support for the implementation of sustainable consumption and production practices?

Needs for policy and sectoral support	Answers (please tick)				Examples and feedback provided
	1. Definite no	2. Likely not	3. Likely yes	4. Definite yes	
Capacity building and training	☐	☐	☐	☐	
Green finance	☐	☐	☐	☐	
Improve access, availability, and affordability of technologies	☐	☐	☐	☐	
Increase demand for green products and services	☐	☐	☐	☐	
Eco-labelling and certification systems	☐	☐	☐	☐	
Support export of green products from Sri Lanka	☐	☐	☐	☐	
Sustainable consumption and production tools, including eco-innovation and life cycle thinking	☐	☐	☐	☐	
International good practices, market demands and experiences	☐	☐	☐	☐	
Other, please specify	☐	☐	☐	☐	

Promoting good practices

Do you wish to promote a good practice example on how sustainable production, which was/is implemented at your factory?	☐ Yes	☐ No	Comments:	
Type of good practice (tick all relevant boxes)	☐ Good housekeeping	☐ Technology modification	☐ Change of raw materials / product inputs	☐ Recycling and reuse
	☐ Product modification	☐ Water efficiency	☐ Energy efficiency	☐ Waste and by-products
	☐ Supply chain management	☐ Eco-labelling and certification	☐ Promotion, marketing and awareness raising to consumers	☐ Transport
Brief description of good practice				
Contact details for follow-up	Name:			
	Email:			
	Telephone:			

Closing questions

Would you be interested to participate in future events on the topic of sustainable consumption and production?	☐ Yes	☐ No	Comments:
Would your factory like to get in contact with resource efficiency specialists?	☐ Yes	☐ No	Comments:
Do you wish to be informed about the outcomes of this survey?	☐ Yes	☐ No	Comments:
Any questions or further remarks?			

THANK YOU!

Enumerator and interview details

Please take picture of company building with name/logo (Optional)	
Interviewer name	
Interview date and time	
Interview location	
Additional notes	
Follow-up actions that may be required	

Proposed sampling

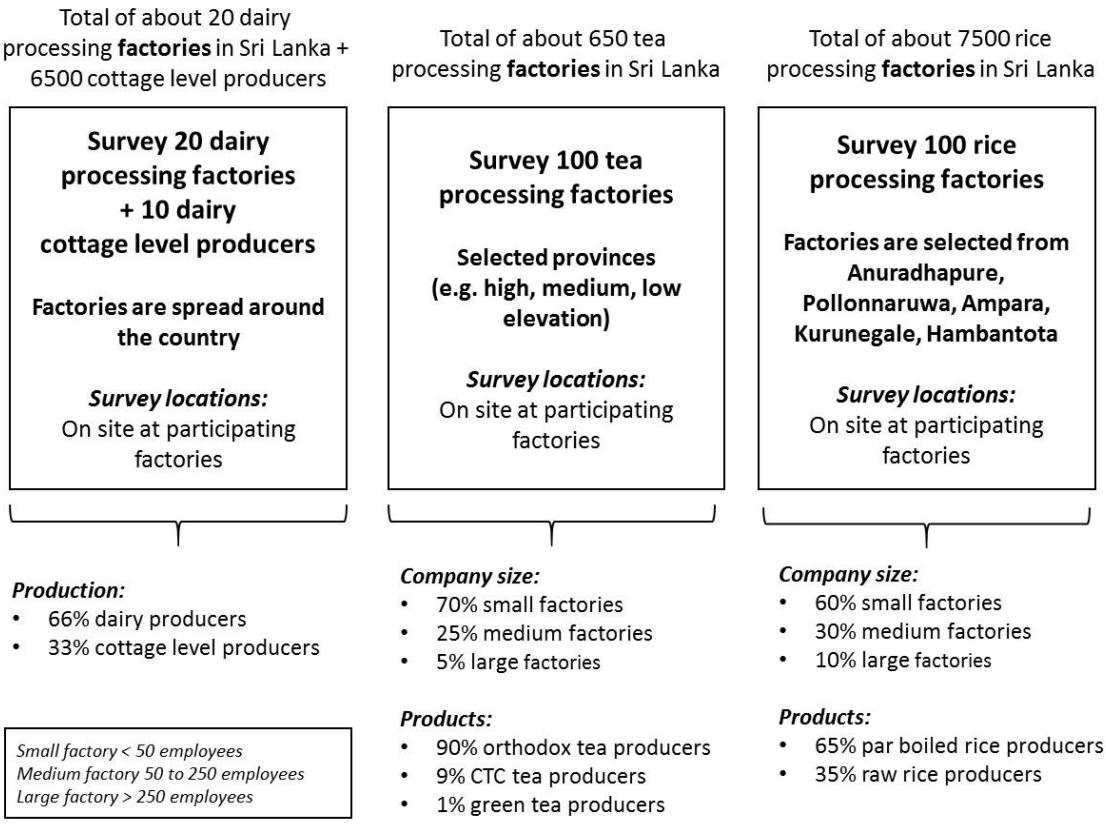


Figure 14: Proposed sampling for sustainable production surveys

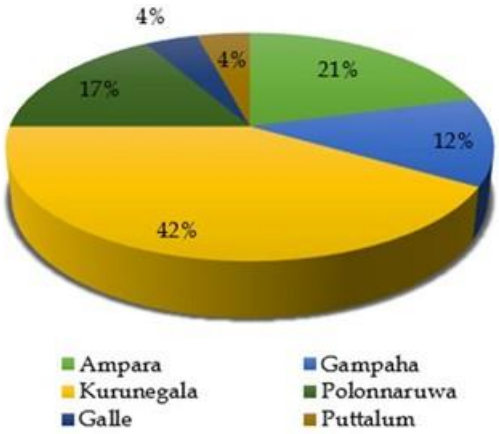
Achieved sampling

Dairy processing

Total dairy processing factories surveyed	24
Micro enterprise (cottage level producers) Milk input is less than 25,000 liters/year	10 (out of approx. total of 6500 factories)
SME Milk input between 25,000 and 10,000,000 liters milk input per year	12 (out of approx. total of 20 factories)
Large factory More than 10,000,000 liters milk input per year	2 (out of approx. total of 8 factories)

Dairy Processing Factories vs Districts

Districts	No
Ampara	5
Gampaha	3
Kurunegala	10
Polonnaruwa	4
Galle	1
Puttalum	1

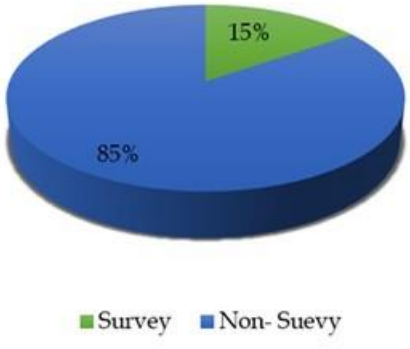


Tea processing

Total tea processing factories surveyed	100
Small factory Green leave input less than 3,000 metric tonnes/year	64
Medium factory Green leave between 3,000 and 10,000 metric tonnes per year	32
Large factory More than 10,000 metric tonnes of of green leave input per year	4

Tea Processing Factories vs Survey

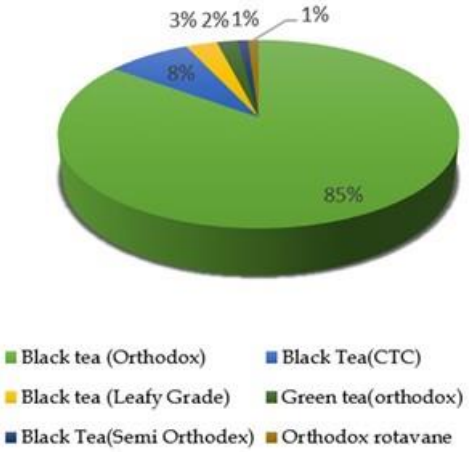
Survey Sample	100
Non- Survey Sample	550
Total Tea Processing Factories	650

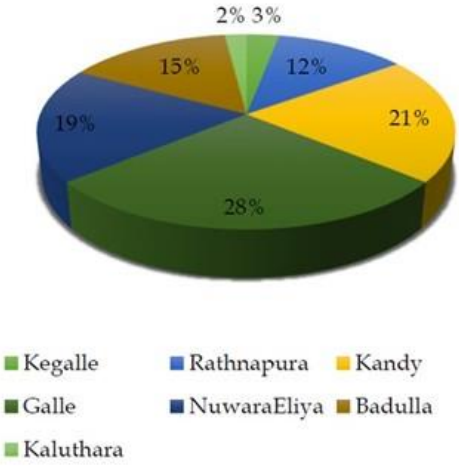


Tea Processing Factories vs Products

Black tea (Orthodox)	85
Black Tea(CTC)	8
Black tea (Leafy Grade)	3
Green tea(orthodox)	2
Black Tea(Semi Orthodox)	1
Orthodox Rota vane	1
Total	100

Districts	No
Kegalle	3
Rathnapura	12
Kandy	21
Galle	28
Nuwara Eliya	19
Badulla	15
Kaluthara	2



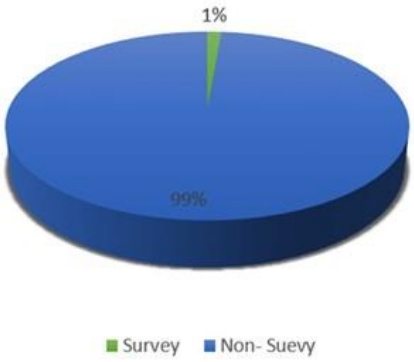


Rice processing

Total rice processing factories surveyed	100
Small factory Paddy input is less than 1200 metric tonnes per year (less than 4 metric tonnes per day)	26
Medium factory Paddy input between 1,200 and 2,400 metric tonnes per year (4 and 8 metric tonnes per day)	30
Large factory More than 2,400 metric tonnes per year of paddy input (more than 8 metric tonnes per day)	44

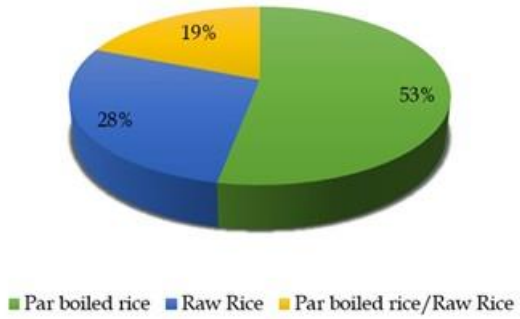
Rice Processing Factories vs Survey

Survey Sample	100
Non- Survey Sample	7400
Total Rice Processing Factories	7500



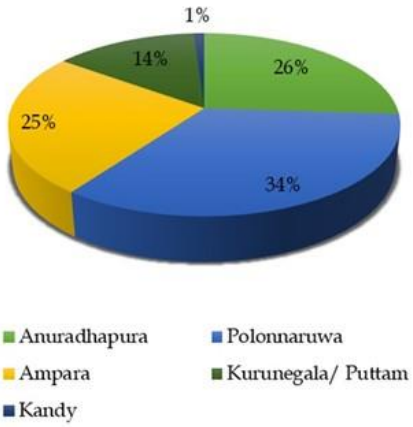
Rice Processing Factories vs Products

Par boiled rice	53
Raw Rice	28
Par boiled rice/Raw Rice	19
Par boiled rice	53
Total	100



Rice Processing Factories vs Districts

Districts	No
Anuradhapura	26
Polonnaruwa	34
Ampara	25
Kurunegala/ Puttam	14
Kandy	1



APPENDIX 4: STAKEHOLDER CONSULTATION WORKSHOP ON 28 APRIL 2016

Workshop objectives

- Provide an overview of the Sri Lanka National Policy Support Component (NPSC) and the SCP baseline assessment.
- Share and learn about existing policy and sector initiatives related to SCP and the three selected pilot sub-sectors (dairy, tea and rice processing).
- Discuss opportunities and potential challenges for the development and implementation of SCP indicators, including supporting sector surveys and performance monitoring system in Sri Lanka.
- Discuss and identify collaborations and synergies with existing policies and sector initiatives.

Agenda

Date: 28.04.2016 Venue: Renuka Hotel, 328, Galle Road, Colombo 3

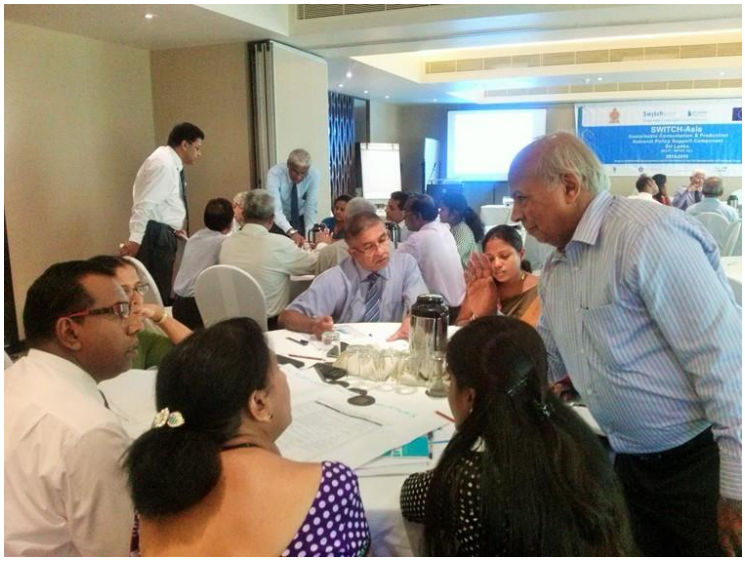
Time	Activity	Who
9.00 – 9.30	Registration	All
9.30 – 9.40	Welcome, workshop objectives and overview	Eng. M. W. Leelaratne, Team Leader
9.40 – 9.50	Address by the Secretary, Ministry of Mahaweli Development & Environment (MoMDE)	Mr. Udaya Seneviratne
9.50 – 10.00	Address by the Delegation of the European Union to Sri Lanka and the Maldives	Delegation of the European Union to Sri Lanka
10.00– 10.15	Overview of Sri Lanka NPSC Project and baseline assessment	Eng. Gamini Senannyake, Key Expert
10.15 – 10.30	Existing SCP related policies and strategies in Sri Lanka	Director, Sustainable Development Division, MoMDE
10.30 – 10.45	History and overview of SCP experiences in Sri Lanka	Mr. Sena Pieris, National Expert
10.45 – 11.05	Refreshment	
11.05 – 11.20	SCP related initiatives - Dairy Processing	Department of Animal Production and Health
11.20 – 11.35	SCP related initiatives - Tea Manufacturing	Tea Research Institute
11.35 – 11.50	SCP related initiatives - Rice milling	Institute of Postharvest Technology
11.50 – 12.10	Consumer perspective on SCP	Consumer Affairs Authoirity
12.10 – 12.25	Sharing international experiences relevant to advance SCP in Sri Lanka	Mr. Dick van Beers, International Expert
12.25 – 12.50	Q&A on presentations held in the morning	All / Facilitator
12.50 – 13.35	Lunch	
13.35 – 14.45	Interactive group discussions – Baseline Survey, SCP indicators, targets, monitoring, etc. • SCP survey in Rice production sub-sector • SCP survey in Tea processing sub sector • SCP survey in Dairy processing sub sector • SCP survey on consumer awareness	All / Breakout sessions Moderated by Project Expert Team and local/foreign Consultants
14.45 – 15.05	Coffee break	
15.05 – 16.05	Presentation of group work	Group leaders in the four groups
16.05 – 16.20	Conclusions, next steps	Mr. Manikku Leelaratne, Team Leader
16.20 – 16.30	Vote of Thanks/End of Workshop	Mrs Jeeva Palugaswewa, Senior Environmental Management Officer, Project Coordinator, MoMDE

Workshop participants

Organisation	Name	Position
Ministry of Mahaweli Development and Environment	Mr. Udaya Seneviratne	Secretary
Ministry of Industry and Commerce (Consumer Aff. Council)	Mrs. Lekha Aryarathne	Secretary
Ministry of Industry and Commerce	Mr. Asitha K. Seneviratne	Additional Secretary
Ministry of Sustainable Development and Wildlife	Mr. H.D. Rathnayake	Additional Secretary
Consumer Affairs Authority	Ms. S.Thiruneelakandan	Director
Ministry of Mahaweli Development and Environment	Mrs. Deepa Liyanage	Director
Dept. of Animal Production and Health - Peradeniya	Dr. K.D. Ariyapala	Director
Ministry of Agriculture	Mr. L.U.N. Sumanasekara	Director
Institute for Post Harvest Management	Dr. Swarnsjika Tilekaratne	Director
CIC Agri Businesses	Mr. Waruna Madhawanarachchi	Director
Ministry of National Planning and Economic Affairs	Dr. S.S.B. Yalegama	Director - Planning
Dept. Of Animal Production and Health - NWP	Dr.B.C.S. Perera	Deputy Director
Industrial Development Board	Mrs. Deepa Gamage	Deputy Director
Industrial Services Bureau	Mr. Neelakanth Wanninayake	Executive Director
Ministry of Plantation Industries	Dr. Dayan Paranawana	Add. Director - Planning
Tea Research Institute	Dr. L.S.K. Hettiarachchi	Additional Director
Consumer Affairs Authority	Ms. Shakila Weerasinghe	Assistant Director
Sri Lanka Standards Institution	Mr. Thisara marasinghe	Assistant Director
Depatment of Agriculture	Mr. N.L. Sudheera	Assistant Director
Ministry of Agriculture - NWP	Mr. Kumara Thilekaratne	Assistant Director
Pelwatte Dairy Industries	Mr. P.S. Liyanpathirana	Quality Ass. Excecutive
Global Sustainability Solutions	Mr. Uchita de Zoysa	Chairman
Life Choice Pvt. Ltd.	Mr. Sunil Rodrigo	Chairman
EU Delegation	Ms. Harshini Halangode	Programme Manager
MoMDE	Ms. Jeeva Palugaswewa	EMO
Finlays Tea Estates	Ms. Manori Gunaratne Perera	Manager - Sustainability
GLOSS	Mr. Kasun Nammuni	Prog. Dev. Manager
National Chamber of Commerce	Mr. Thilak Godamane	President
Rasoda Dairies Pvt. Ltd.	Mr. Daminda Perera	Managing Director
Talawakele Tea Estates	Mr. Theja Dharmaratne	General Manager
NCPC	Eng. Samantha Kumarasena	COO
Food Commissioner's Department	Ms. Shinthujaa Sirarajasundaram	Graduate Trainee
Paddy Marketing Board	Mr.S.M. Saman Palitha Bandara	Deputy General Manager
Paddy Marketing Board	Ms. Nadeeka Lakmali	Regional Manager
Industrial Technology Institute	Dr. Radhika Samaela	ADG
Industrial Technology Institute	Dr. Theja Herath	PRS
Tea Research Institute	Dr. W.S. Botheju	PRO
Sri Lanka Tea Board	Mr. Jayantha Edirisinghe	Tea Commissioner
Cargills Ceylon	Mr. Haridas Fernando	DGM - Agriculture

Organisation	Name	Position
Milco Ltd.	Mr. Ashoka Atapattu	
University of Ruhuna - Green Technology	U.W.W. Lakmali	
University of Ruhuna - Green Technology	U.Wickramarathna	
University of Ruhuna - Green Technology	Mr. K.A.S.D. Jayasundara	
Federation of Chambers and Commerce Industry of Sri Lanka	Mr. Eranda Fernando	Manager - Membership and Services
SIPL	Mr. Kithsiri Wijesundara	
NERD	MR. D.D.A. Namal	Director General
University of Ruhuna - Faculty of Agriculture	Ms.M.G.G. Awanthi	Lecturer
Watawala Plantations	Mr. Milton Wijepala	General Manager
Ministry of Sustainable Development and Wildlife	Ms. Marisha Bandaratilaka	Consultant
Ministry of Plantation Industries	Ms. J.M.C. Priyadarshani	Plantation Mon. Officer
	Mr. Ian Fernando	A.S.G.
Switch Asia Project	Mr. Manikku Wadu Leelaratne	Team Leader
	Mr. Gamini Senanayake	Key Expert 2
	Mr. Sena Peiris	National consultant
	Mr. Dick Van Beers	International consultant
	Ms. Gayashani Uswatte	Project Assistant
	Mr. Bhathiya Dawulagala	Project Assistant

Pictures



APPENDIX 5: STAKEHOLDER CONSULTATION WORKSHOP ON 27 OCTOBER 2016

Workshop objectives

- Present results from surveys undertaken with consumers and factories in diary, tea, rice processing sectors.
- Consolidate SCP indicators and their base line values at national and three pilot sub-sectors.
- Discuss opportunities for implementing and integrating the defined SCP indicators into existing and upcoming policies and initiatives.
- Discuss and identify collaborations and synergies with national and sector initiatives.

Agenda

Time	Activity	Who
8.30 – 9.00	Registration	All
9.00 – 9.05	Welcome and opening remarks from Ministry of Mahaweli Development and Environment	Ministry of Mahaweli Development and Environment
9.05 – 9.10	Opening remarks from EUD	Delegation of the European Union to Sri Lanka and Maldives
9.10 – 9.30	Project background, workshop objectives and overview	Facilitator Mr. Manikku Wadu Leelaratne, Team Leader
9.30 – 9.45	Self-introduction of participants	Participants
9.45 – 10.30	Presentation of results and indicators from surveys with consumers and factories in diary, tea, rice processing sectors	Mr. Sena Pieris, National Expert
10.30 – 11.00	Tea and coffee break	
11.00 – 11.30	Presentation on draft national level SCP indicators, including international perspectives	Mr. Sena Pieris, National Expert Mr. Dick van Beers, International Expert
	SCP indicators and monitoring schemes – multi-stakeholder perspectives and updates:	
11.30 – 11.35	• Consumers	Consumer Affairs Authoirity
11.35 – 11.40	• Dairy Processing	Livestock Department
11.40 – 11.45	• Tea Manufacturing	Sri Lanka Tea Board / Tea Research Institute
11.45 – 11.50	• Rice milling	Institute of Post Harvest Technology
11.50 – 12.00	• SCP Goal (no 12) in Sustainable Development Goals (SDGs) in Sri Lanka	Ministry of Wildlife and Sustainable Development
12.00 – 12.40	Interactive group discussions on SCP indicators • Consumer survey • Dairy processing • Tea processing • Rice processing	All / Roundtable facilitators
12.40 – 13.00	Presentation of group work	Group leaders in the four groups
13.00 – 14.00	Lunch	
14.00 – 15.00	Interactive group discussions on national SCP Indicators and monitoring system	All / Roundtable facilitators

Time	Activity	Who
15.00 – 15.20	Presentation of group work	Group leaders in the four groups
15.20 – 15.40	Short coffee break	
15.40 – 15.50	Reflections from Ministry of Mahaweli Development and Environment on SCP indicator monitoring and SDG no. 12	Ministry of Mahaweli Development and Environment
15.50 – 16.10	Conclusions, next steps	Mr. Manikku Wadu Leelaratne, Team Leader
16.10 – 16.15	Vote of thanks and of workshop	Mrs Jeeva Palugaswewa, Senior Environmental Management Officer, Project Coordinator, MoMDE

Workshop participants

Organisation	Name	Position
Consumer Affairs Authority	Ms. Lekha Aryaratne	Secretary to CAC
Ministry of Mahaweli Development and Environment	Mr.W. Dissanayake	Additional Secretary
Ministry of Industry and Commerce	Mr. Asitha K. Senevithte	Additional Secretary
Ministry of Sustainable Development and Wildlife	Mr. H.D. Rathnayake	Additional Secretary
Institute for Post Harvest Technology	Dr. Swarnsjika Thilekaratne	Former Director
Institute for Post Harvest Technology	Mr. D.P.C. Swarnasiri	Former Add. Director
Ministry of Agriculture - NWP	Mr. Kumara Thilekaratne	Assistant Director
Tea Research Institute Talawakele	Mr. W.S. Botheju	Deputy Director General
Ministry of Mahaweli Development and Environment	Mr.D.C. Siribaddana	Director (EP&E)
Ministry of National Policies and Economic Affairs	Dr. Sugath Yalegama	Director
Tea Research Institute Talawakele	Dr. L.S.K. Hettiarachchi	Additional Director
Ministry of National Policies and Economic Affairs	Mr.D.M. Kumudu Dissanayake	Assistant Director
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Industrial Technology Institute	Ms. Radhika Samarasekara	Assistant Director General
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Dept. of Animal Production and Health	Dr. B.C.S. Perera	Deputy Director
Industrial Services Bureau	Mr. A.C. Vidanapatha	Director - Technical
Global Sustainability Solutions	Ms. Uchita De Zoysa	Chairman
Finlays Tea Estates	Ms. Manori Guneratne	Manager Sustainability
Industrial Technoloy Institute	Dr. Theja Herath	Food Technologist
National Cleaner Production Center	Ms. Uthpala Sankalpani	RECP Technologist
Industrial Services Bureau	Mr.Thilanka Alwis	Consultant
Industrial Services Bureau	Mr. W.A.D.D. Peries	
Global Sustainability Solutions	Ms. Nilushi Kumarasinghe	Research Consultant
Coordinating Secretariant for Science Technology and Commerce	Dr. Kumuduni Gunasekara	Project Scientist
Universty of Ruhuna	Ms. U.W.W. Lakmali	Undergraduate

Organisation	Name	Position
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Department of Agriculture	Mr. Aruna Sooriyarahchi	Dept. Agriculture
Ministry of Mahaweli Development and Environment	Ms. Chandima Mohottige	PA
	Ms. Kema Kasturiarachchi	EMO
	Ms. Chamika Iddagoda	PA
	Mr. Anuradha Alwis	
Milco Pvt. Ltd.	Mr. S.D.C.A. Jayathileka	Asst. Manager
Industrial Services Bureau	Mr. F.G.C.D. Bandara	Trainee Consultant
University of Ruhuna - Faculty of Agriculture	Ms. M.G.G. Awanthi	Lecturer
University of Ruhuna - Faculty of Agriculture	Ms. C.P. Rupasinghe	Senior Lecturer
Private Pariticpant	Mr. Kithsiri Wijesundara	Lecturer Consultant
Switch Asia Project	Mr. Manikku Wadu Leelaratne	Team Leader
	Mr. Gamini Senanayake	Key Expert 2
	Mr. Sena Peiris	National consultant
	Mr. Dick Van Beers	International consultant
	Ms. Gayashani Uswatte	Project Assistant
	Mr. Bhathiya Dawulagala	Project Assistant

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