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Contents

Abbreviations & Acronyms

CFL	Compact Fluorescent Lamp
CIS	Commonwealth of Independent States
EDB	Export Development Board
EMP	Environmental Management Plan
EPF	Employees Provident Fund
EPL	Environment Protection License
ETF	Employee's Trust Fund
FAO	Food and Agriculture Organization
FOB	Free On Board
GDP	Gross Domestic Product
GN	Grama Niladhari
HCV	High Conservation Value
ILO	International Labor Organization
ISEAL	International Social and Environmental Accreditation and Labeling
LED	Light-Emitting Diode
PPE	Personal Protective Equipment
RA	Rainforest Alliance
RF	Rainforest
SAN	Sustainable Agriculture Network
SL	Sri Lanka

Executive Summary

Tea is one of the main components in Sri Lankan export agriculture sector which accounts for 19% of global tea demand. Sri Lanka has become the world's third largest tea exporter to the world market. About 96% of the total tea production in our country is exported to about 40 countries.

Number of tea plantation companies in the country acquired Sustainable Agriculture Network/Rainforest Alliance Certification to make environmental claims and improve the quality of the product, targeting international market. This study was conducted focusing 19 SAN certified tea plantation companies to assess the impact of the certification on the overall production process, final product, work force as well as the natural environment.

With regard to the entities selected, the study shows that the SAN certification resulted in positive impacts on all socio-environmental aspects evaluated; workers' health and safety, professional training, pesticide handling and reduction, natural resources conservation and relationship with the community.

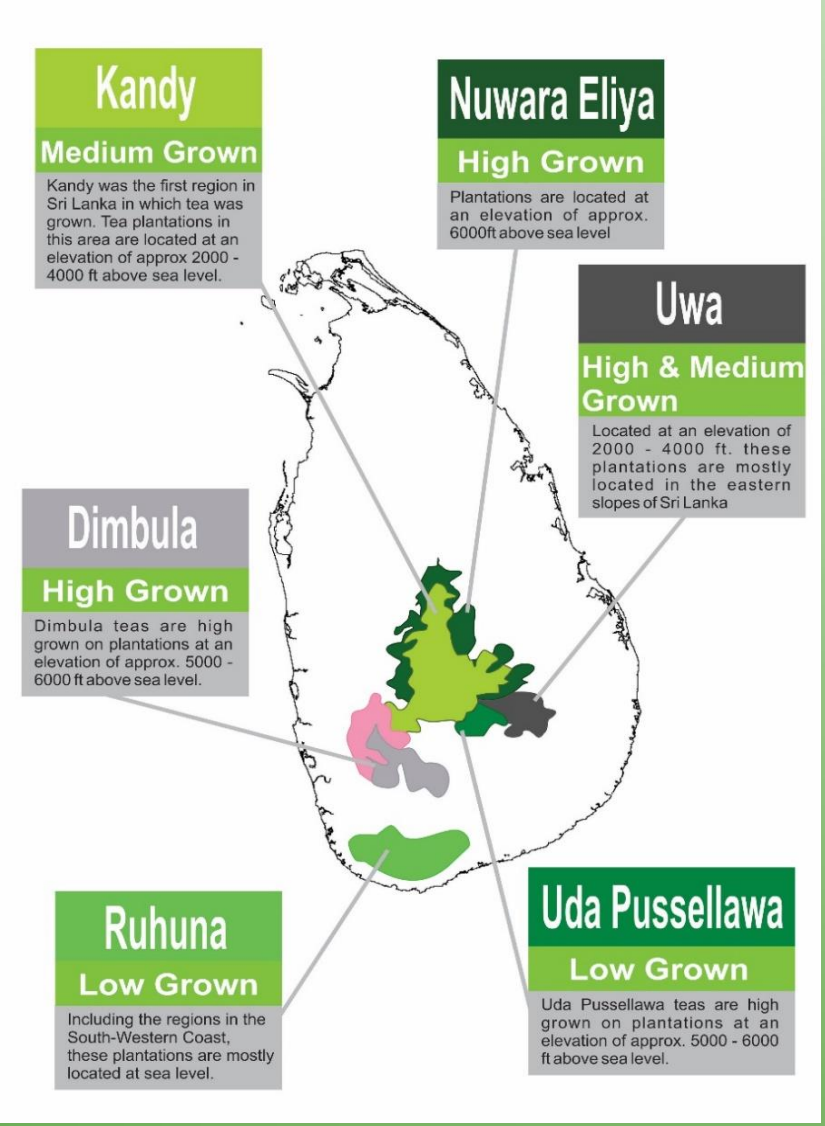
Although the direct economic benefits of certification is not obvious, there is a general perception that that benefits of certification greatly outweigh the costs. As such, SAN certification should not be viewed only as a marketing tool to find price premiums. Other benefits of certification such as cost savings through improved production and processing, increasing overall efficiency through better management, deflecting a negative image of the industry, and contributing to environmental protection should be effectively communicated.

Chapter 01

The Adoption of SAN Certification in Sri Lanka' Tea Sector

Sri Lanka's Tea Sector: An overview

Ceylon tea from Sri Lanka has long remained as the best in the world with its inherent unique taste and has a strong reputation and tradition extending well over a century for producing best quality tea. The influence of unique climatic conditions across tea growing areas of the island is believed to impart a variety of flavors and aromas, resulting in the production of an array of fine teas. Scottish by origin, James Taylor; the pioneer in commercial tea planting in "British Ceylon", established 19 acres of tea in the city of Kandy, at the Loolecondra Estate in 1867. Ever since, the tea industry in Sri Lanka has flourished into one of the major export industries, accounting for about 15% of the total exports while contributing for approximately 65% of the total agriculture exports of the country (EDB 2016). The tea industry contributes to approximately 2% of country's GDP with nearly 2 million direct and indirect employments (Sri Lanka Tea Board 2016). At present, Sri Lanka is the 4th largest tea producing country in the world with approximately 10% of the global market share (FAO 2015) and considered as the market leader in the production of orthodox black tea (EDB 2016).



The total extent of land under tea cultivation in Sri Lanka has expanded from 19 acres in 1867 to well over 200,000 hectares at present. Tea plantations in Sri Lanka are broadly categorized into two groups as tea estates and small holdings based on the ownership and extent. According to Tea Control Act of Sri Lanka, tea smallholdings are defined as tea lands less than 10 acres while some reports define tea lands of 4 hectares or less as tea small holdings (Ministry of Plantation Industries 2015). However, there seems to be an ambiguity in the definition of tea small holds. For instance, the Sri Lanka Tea Board has implemented development activities in lands between 10 and 50 acres under smallholder development programs (Perera 2014). The average land extent of a tea small holding is approximately 0.33 hectares (Ministry of Plantation

Industries 2015). At present, the tea small holder sector's contribution to annual national tea production is approximately 70 percent (Jayasuriya 2003; Basnayake and Gunaratne 2011).

An agricultural holding of 20 acres or more in extent, and under the same unit of management is considered as an estate (EDB 2016). Tea plantations were taken over by the Government in the 1960s and then have been privatized. About 40% of the total tea cultivated area in the country is managed by 20 Regional Plantation Companies. In addition, about 9300 hectares under tea cultivation are owned by government institutions such as Janatha Estate Development Board and Sri Lanka State Plantation Corporation (Ministry of Plantation Industries 2015). Estate sector contribution to annual national tea production is approximately 30 percent.

Tea growing areas in Sri Lanka are characterized by their height; with low- grown areas up to 600m above sea level, mid- grown areas from 600 – 1200m over sea level and high- grown areas over 1200m. Largest extent (78,000 ha) of tea cultivation is in the Central Province of which 50,000 ha (65%) are in the Nuwara Eliya District, followed by Southern, Sabaragamuwa and Uva Provinces. Tea small holdings are mostly accumulated in the Southern and Sabaragamuwa provinces (72%) and Ratnapura, Galle, and Matara have the highest extent of small holder owned tea land (69%). The majority of Estate sector extent of tea is in Central and Uva provinces (77%) out of which 60% is in Nuwara Eliya and Badulla Districts.

Sri Lanka produces tea throughout the year with an average annual tea production of about 340 million kilograms per annum. Approximately 51% of tea production is exported in value added forms such as green tea, flavored tea, organic tea, instant tea, iced tea, and ready-to drink tea. The Middle East/Gulf Region is currently the major export market of Sri Lanka, and absorbed almost 55% of the total Ceylon Tea produce, while the Russian Federation and other Commonwealth of Independent States (CIS) countries accounting for another 22% of the tea exports. Russia was the single largest buyer of Ceylon Tea in 2016, with 36.1 million kg imports, followed by Turkey (33.7 million kg), Iraq (31 million kg) Iran (29.6 million kg) and United Arab Emirates (22.9 million kg) (FAO 2016).

Changing global markets driven by socio-economic and political influences, coupled with environmental factors affecting the yield and long-term productivity of tea lands, have made Sri Lanka's tea sector vulnerable to loss of its market share. Recent fluctuations in FOB prices of tea in Colombo Tea Auction and declines in export volumes of Ceylon tea highlights this negative trend. Economic sanctions imposed on some Ceylon Tea importing countries, internal political instability in some of the major tea buying countries, low productivity in tea lands, high cost of production, poor adoption of modern technology and low capital investment, inadequate replanting, the misuse of "Ceylon Tea" brand name and illegal trading of refused tea have been identified as some of the major issues faced by the Tea sector in Sri Lanka (Ministry of Plantation Industries 2015). Meanwhile, the compaction from other tea producing countries is also on the rise.

To overcome some of the challenges faced by the tea sector in Sri Lanka, Ministry of Plantation Industries, Sri Lanka Tea Board, and Export Development Board have introduced a wide range of assistance and development programs. Some of such assistance programs include system

certification scheme, tea grading area capacity development scheme and assistance program for promotion and development of brand names and brand excellence. In order to remain competitive in the global market, exploring possible means of value addition, quality improvement, product diversification and meeting market access requirements such as standards and quality certifications will be key areas to focus in the future.

Sustainability Standards and Certification

Growing public concern for the environment especially during the last few decades has resulted in environmental issues gradually taking a center stage in global economic and trade policy agenda (Perera et al. 2006; 2008). Certification, in general, can be described as a mechanism that aids to identify the source and the quality of a product or a production process. Depending on the nature and trade of the product or service, certification can be mandatory or voluntary.

Voluntary socio-environmental certification or sustainability certification systems specifically aim to provide a credible evidence to customers that the product they purchase is originated from an environmentally friendly source while it's production process or the business practices being socially responsible i.e. complied with labor laws, and that it promotes dignified working conditions (Perera et al 2006; Vlosky et al 2007). In a context of responsible consumption, these characteristics add more value to the products. As such, the goal of these voluntary sustainability certification systems is to reward sustainable business practices by providing market-based incentives to those firms adhering to sustainability standards.

With rapidly growing concerns over the environment and social concerns associated with agricultural products, the global agriculture market is shaping up to accommodate new market conditions, and sustainability certification is increasingly becoming a market requirement. Sustainability certification systems are being increasingly accepted in the global food sector because of the concerns over environmental and social production conditions are linked to health concerns in the day to day food choices of consumers (Raynolds 2007).

The Sustainable Agriculture Certification / Rainforest Alliance Certification

Sustainable Agriculture Certification (SAN) of farmlands has gained momentum as a potential means of value addition to take advantage of the emerging markets for agricultural products produced in environmentally and socially responsible manner. As with other green labeling and certification schemes, the underlying logic is that the market should be able to reward farms producing products according to rigorous, comprehensive and independently audited standards based on social and environmental values. More than 1.2 million of farmers in more than 40 countries, producing over 100 crops, are currently certified under the SAN/Rainforest Alliance system (SAN 2016). According to SAN (2016), over 15% of the world's tea, 13.6% of cocoa and over

5% of coffee and bananas come to the market under SAN certified label. The SAN/RA certification system is jointly owned and collaboratively managed by two non-governmental organizations:

The Sustainable Agriculture Network is an international association of nonprofit organizations working in support of rural development and the conservation of biodiversity. The SAN is currently comprised of ten member organizations, seven of them based in lower- or middle-income tropical nations. The SAN initiated its activities in 1997 and was legally established with headquarters in Mexico in January 2010.

The Rainforest Alliance is an international nonprofit organization dedicated to conserving biodiversity and improving livelihoods. Founded in 1987, the Rainforest Alliance is headquartered in New York and works in 89 countries throughout the Americas, Africa, Asia, Europe, and Oceania. The organization supports farmers, forest communities, and local businesses to conserve natural resources and pursue sustainable livelihoods while collaborating with private business to promote sustainable production and consumption.

Source: *www.imaflora.org*

SAN Vision
A world where agriculture contributes to the conservation of biodiversity and sustainable livelihoods

SAN Mission
To be a global network transforming agriculture in to a sustainable activity

The Rainforest Alliance Vision
A world in which people and the planet prosper together

The Rainforest Alliance Mission
To conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices and consumer behavior

The SAN Standards

A centerpiece of the SAN/Rainforest Alliance certification system is the SAN Sustainable Agriculture Standard, which codifies requirements for farms and farmer groups to become SAN Certified. The SAN Standard was developed through an international multi-stakeholder process, in accordance with the requirements of the ISEAL Alliance's Code of Good Practice for Setting Social and Environmental Standards. SAN Standard is organized into ten principles, each of which has several specific requirements (criteria) against which farms and groups seeking certification are evaluated. Each of the principles is briefly summarized Box 1.

BOX 01

1 - Social and environmental management system:

The social and environmental management system is a set of policies and procedures managed by the farm management or group administrator for planning and executing operations in a manner that fosters the implementation of the best management practices indicated in this standard. The social and environmental management system is dynamic and adapts to changes that occur. It also incorporates the results of internal and external evaluations to encourage and support continued improvement on the farm. The scale and complexity of the social and environmental management system depends on the level of risk and the size and complexity of the operation, the type of crop, as well as the farm's external and internal environmental and social factors.

2 - Ecosystem conservation:

Natural ecosystems are integral components of the agricultural and rural countryside. Carbon capture, crops pollination, pest control, biodiversity and soil and water conservation are just some of the services provided by natural ecosystems on farms. Certified farms protect these natural ecosystems and conduct activities to restore degraded ecosystems. Emphasis is placed on restoring natural ecosystems in areas unsuitable for agriculture, for example by reestablishing the riparian forests that are critical to the protection of water channels. The Sustainable Agriculture Network recognizes that forests and farms are potential sources of timber and non-timber forest products that help to diversify farm income when they are managed in a sustainable manner.

3 - Wildlife protection:

The farms certified under this standard are refuges for resident and migratory wildlife, especially species that are threatened or endangered. Certified farms protect natural areas that contain food for wild animals or habitats for reproduction and raising offspring. These farms also carry out special programs and activities for regenerating and restoring ecosystems important to wildlife. At the same time, the farms, their owners and employees take measures to reduce and eventually eliminate the number of animals in captivity, despite traditional practices of keeping wildlife as pets in many regions of the world.

4 - Water conservation:

Water is vital for agriculture and human existence. Certified farms conduct activities to conserve water and avoid wasting this resource. Farms prevent contamination of surface and underground water by treating and monitoring wastewater. The Sustainable Agriculture Standard includes measures for preventing surface water contamination caused by the run-off of chemicals or sediments. Farms that do not have such measures guarantee that they are not degrading water resources through the implementation of a surface water monitoring and analysis program, until they have complied with the stipulated preventative actions.

5 - Fair treatment and good working conditions for workers:

All employees working on certified farms, and the families that live on these farms, benefit from the rights and conditions established in the United Nations' Universal Declaration of Human Rights and the Convention on the Rights of the Child, and in the International Labor Organization's (ILO) conventions and recommendations. Farms pay salaries and benefits equal or more than the legal minimum, and the workweek and working hours must not exceed the legal maximums or those established by the ILO. Workers may organize and associate freely, especially for negotiating working conditions. Certified farms do not discriminate and do not use forced or child labor; to the contrary, these farms work to offer employment opportunities and education to people in neighboring communities. Housing provided by certified farms is in good condition, and has potable water, sanitary facilities and domestic waste collection. Families living on certified farms have access to medical services and the children have access to education.

6 - Occupational health and safety:

All certified farms have an occupational health and safety program to reduce or prevent the risk of accidents in the workplace. All workers receive training on how to do their work safely, especially regarding the application of agrochemicals. Certified farms provide the necessary equipment to protect workers and guarantee that the tools, infrastructure, machinery and all equipment used on the farms is in good condition and does not pose a danger to human health or the environment. Measures are taken on these farms to avoid the effects of agrochemicals on workers, neighbors and visitors. Certified farms identify potential emergencies and are prepared with plans and equipment to respond to any event or incident, as well as to minimize the possible impacts on workers and the environment.

7- Community relations:

Certified farms are good neighbors. They relate in positive ways with neighbors, surrounding communities and local interest groups. The farms periodically inform the surrounding communities, neighbors and interest groups about their activities and plans, and they consult with interested parties about changes on farms that could have potential impacts on the social and environmental well-being of surrounding communities. Certified farms contribute to local economic development through training and employment and try to prevent negative impacts on the areas, activities or services that are important for local populations.

8 - Integrated crop management:

The Sustainable Agriculture Network encourages the elimination of chemical products known internationally, regionally and nationally for their negative impacts on human health and natural resources. Certified farms contribute to the elimination of these products through integrated crop management to reduce the risk of pest infestations. They also record the use of agrochemicals to register the amounts consumed, and work to reduce and eliminate these products, especially the most toxic ones. To minimize the excessive application and waste of agrochemicals, certified farms have the procedures and equipment for mixing these products and for maintaining and calibrating application equipment. Certified farms do not use products that are not registered for use in their country, nor do they use transgenic organisms or other products prohibited by different entities or national and international agreements.

9 - Soil management and conservation:

One of the objectives of sustainable agriculture is the long-term improvement of the soils that support agricultural production. Certified farms carry out activities that prevent or control erosion, and thus reduce the loss of nutrients and the negative impacts on water bodies. The farms have fertilization programs based on the crop requirements and soil characteristics. The use of vegetative ground cover and crop rotation reduces dependency on agrochemicals for the control of pests and weeds. Certified farms only establish new production areas on land that is suitable for agriculture and the new crops, and never by cutting forests.

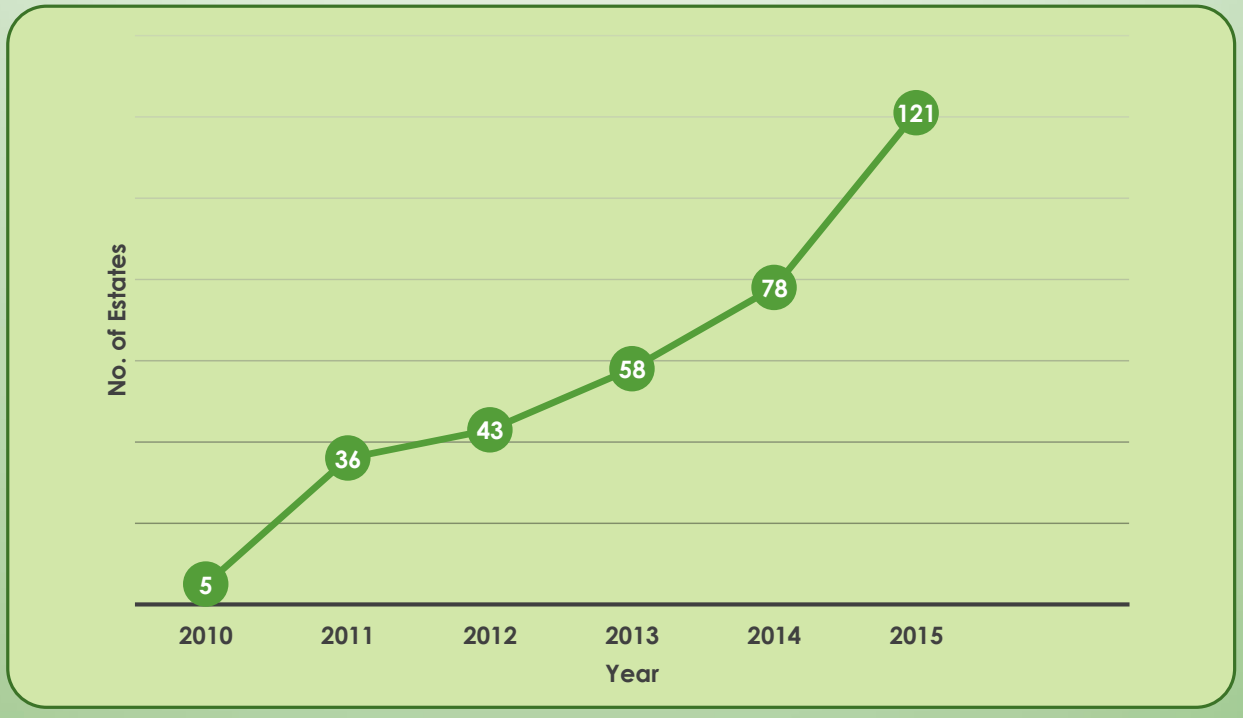
10 - Integrated waste management:

Certified farms are clean and orderly. Farm workers and residents cooperate with maintaining the farm clean and are proud of the farm's image. There are programs for managing waste according to its type and quantity, through recycling and waste reduction and reuse. The final destination of waste on the farm is administered and designed to minimize possible environmental and human health impacts. Certified farms have evaluated the transportation and treatment services supplied by contractors and know the final destination of the waste generated on the farm.

Source: *Interpretation Guide - Sustainable Agriculture Standard 2015*

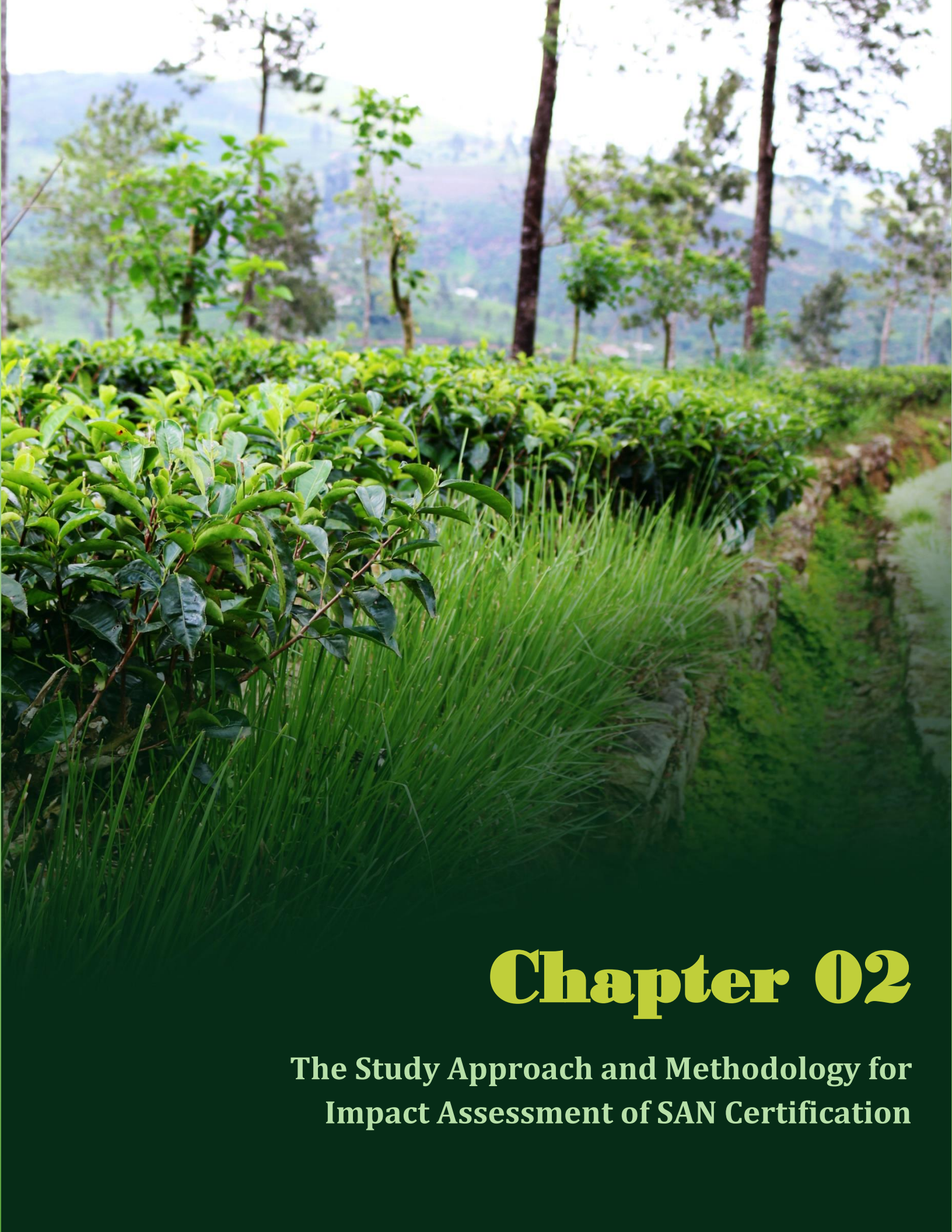
SAN Certification in Sri Lanka's Tea Sector

Tea sector in Sri Lanka is an important employer providing employment opportunities in harvesting and production throughout the year. Approximately 4% of the country's lands are under tea cultivation. SAN/RF tea certification has expanded dramatically over the past five years, supported by sustainable sourcing commitments by Unilever (Lipton). For instance, Sri Lanka accounted for 4.2% of total SAN certified global tea produce in 2014 (SAN 2015). The majority of the Estate sector plantations have adopted RF certification while smallholders are being increasingly encouraged to adopt RF certification. The number of RF certified tea estates has increased over the last five years and totaled 121 by the end of the year 2015.



Growth in RF certified tea estates

Current environmental challenges associated with tea lands include soil erosion, overuse of fertilizers and agrochemicals, water source depletion/pollution, and indirect contribution to deforestation. Limited access to quality housing, health care, education, comparatively low-income levels, less awareness and attention on occupational health and safety aspects are among the key social challenges. SAN certification is designed to improve environmental and social aspects of agro-businesses while ensuring the economic viability. The main objective of this study was to independently evaluate such measurable environmental, social and economic benefits of adopting RF/SAN certification in tea estates of Sri Lanka.



Chapter 02

The Study Approach and Methodology for Impact Assessment of SAN Certification

Impact Evaluation

The main objective of this study was to independently evaluate the measurable environmental, social and economic impacts of adopting RF/SAN certification in tea estates of Sri Lanka. During the cultivation and production process, SAN certified estates are believed to adopt a range of best practices and procedures as required by the certification guidelines. However, the improvements in economic, social, or environmental aspects of the business may also be influenced by conjuncture factors existed before becoming certified. This impact evaluation study was designed to isolate such conjuncture effects, so that the impact of SAN/RFA certification can be more precisely identified. The evaluation of certification impacts can be identified by comparing certified estates with non-certified estates. However, it is practically difficult to locate such comparable units in the same geographical setting to isolate the effects of other environmental and social variables on the final outcome. Hence, in this study, present status of selected SAN certified tea estate were compared with their baseline information compiled at the time of their first application to become SAN certified. Pre-identified set of key variables (environmental, social and economic) were selected for detailed analysis. The differences between baseline and present performance were identified as impacts of SAN certification.

A. Sample selection and research design

The sample for the intended study was selected from a population of 78 tea estates that were SAN certified (i.e. estates obtained SAN certification in 2014 or before). The rationale for this selection was that impacts of SAN certification would be more felt on lands where best practices have been implemented for few years. Accordingly, 19 SAN-certified lands were randomly selected for detailed impact assessment. The sample was selected subject to the precision of results required and time constraints to complete the study (margin of error = 20 and confidence level = 95%). Selected social, economic and environmental parameters of SAN certified lands were compared with the baseline data. The objective was achieved predominantly through review of documentary evidence verified by field observations and stakeholder interviews.

B. Research Instruments

Structured questionnaires were the main research instrument used in data collection to validate documentary evidence. Separate questionnaires were designed to gather information from different stakeholder groups. The questionnaire predominantly employed items measured using a five point Likert scale anchored by 1 = strongly disagree to 5 = strongly agree, or 1= highly inappropriate to 5 = highly appropriate to assess respondent awareness and knowledge on sustainable agriculture aspects/applications. Open ended questions were also used where necessary to gather further information on respondent opinions. In addition, information on respondent demographics was also gathered through the questionnaire.

Key Information requirements and targeted stakeholder groups

1. Company profile: Sought information on infrastructure, finance, company policies, estate and crop management, environmental management, legal compliance, benefits granted to workers, etc. via interviews with managers or persons responsible for the specific operation.

2. Employee profile: Sought information on characteristics of working conditions, hiring procedures, professional training, access to health services, conservation of natural resources, environmental preservation, worker awareness on safety policies and degree of compliance via interviews with estate's employees and outside workers. Additional information was obtained from estate medical office/hospital, schools, and GN office.

3. Worker housing profile: Sought information from worker households on infrastructure, garbage and sewage disposal, comfort and sanitary conditions, displacement of inhabitants in emergency situations, etc.

4. Stakeholder relationships: Sought information from stakeholder representatives (rural workers' unions, associations, councils and contractors/partner firms) to analyze the companies' relationship with stakeholders and their fulfillment of social and environmental obligations.

Interviews were conducted with the informants selected by the estate management (under authorized acquiescence), person in charge of the operation or randomly selected regular employees (including those living in the estate, pesticide appliers, and workers under the age of 18) and temporary workers (including those living on the property and those under the age of 18). The main socio-environmental data gathered included the preservation of native vegetation, conservation of water resources, waste management, workers' training, working conditions, and worker safety, pesticide handling and application.

C. Field Observations

Field observations involved visits to permanent preservation areas, tea cultivations and the infrastructure of the operations including factories and worker households. Field verifications were done based on a pre-defined checklist of key parameters. Field observations were carried out by a team of 3 enumerators who were given a prior training on conducting field evaluations based on the selected set of parameters. The qualitative ranking for each attribute was determined based on enumerators' cumulative judgment.

A factory investigation

- ✓ The degree of implementation of each SAN principle was evaluated using several easily-observable indicators.
- ✓ Each indicator was qualitatively ranked on a 1 to 5 scale.
- ✓ Accordingly, a cumulative score was computed for each parameter.

D. Data entry, evaluation and analysis

Data analysis were carried out using both single and multiple/combined attributes. In the individual analysis, information from single source/single item in the questionnaire was used to compute an average score for the attribute evaluated. In the combined analysis, variables on the same theme, but from different sources were pooled together to compute a cumulative score for the attribute. In the field observations, the field enumerators confirmed the existence of sustainability implementation situations. However, it was not possible to observe all situations during the data collection period, so this information has only partial reach.

- In the operation and contractor profiles, there may be a tendency to highlight favorable characteristics and/or to omit information on inappropriate situations or those that could characterize a failure to comply with the legislation or SAN certification standards.
- In estate worker profiles (pesticide applicator, tea plucker, factory worker and housing profile), an array of personal biases and judgments regarding situations that take place at the operation were taken into account. However, the multiple interviews and multiple sources of information reduced the influence of biased information in the aggregated data, reflecting situations that can be considered as real or as perceived by the majority.

Thus, in the combined analysis, the impact of certification was assessed mainly through field observations and objective analysis of documentary evidences. In their absence, interviews with the management, workers, and other relevant stakeholders such as contractors were conducted to gather their opinions. The final improvement ratings for each attribute were classified using a scale of stars based on the mean ratings derived through single and combined data analysis. Five stars (⍟⍟⍟⍟⍟) represent the best situation and one star (⍟) represents the worst situation (or no improvement), as described in Table 1. Accordingly, the direction of the impact was finally rated as Positive, Moderate or Neutral/Negative.

Table 1: *Final ratings for measured attributes*

Ranking of quality attributed to the operations		
Criterion	Symbols	Impact
Mean rating of 0 to 1.4	⍟	Negative/Neutral
Mean rating of 1.5 to 2.4	⍟⍟	
Mean rating of 2.5 to 3.4	⍟⍟⍟	Moderate
Mean rating of 3.5 to 4.4	⍟⍟⍟⍟	Positive
Mean rating of 4.5 and above	⍟⍟⍟⍟⍟	

Qualitative ranking given for each attribute was based on the following Impact Rating Criteria (Table 2). For certain attributes, a cumulative score was derived based on ratings given for several parameters (as indicated in parenthesis of tables in the Results chapter).

Table 2: *Impact rating criteria used in the analysis*

Parameter Code	Evaluated Method	Description of the rating criteria
1	Rating based on the mean percentage reduction of the electricity consumption (kwh) in the factory to produce a 1kg of "made-tea", compared to baseline year.	1- Less than 20 % reduction
		2 - 21- 40 % reduction
		3 - 41- 60 % reduction
		4 - 61- 80 % reduction
		5 – Over 80% reduction
2	Rating based on field observations (current use of energy efficient bulbs such as CFL/LED bulbs, natural lighting inside the factory and office premises).	1 - No use of energy efficient bulbs, poor use of natural lighting
		2 - Less than 25% of bulbs are energy efficient poor use of natural lighting
		3 - About 25 - 50% lights used are energy efficient, some use of natural lighting
		4 - About 50 - 75% poor use of natural lighting, satisfactory use of natural lighting
		5 - 100% use of energy efficient bulbs, effective use of natural lighting
3	Rating based on the interviews with the workers: worker's level of agreement with the perceived change due to certification	1- Strongly Disagree
		2- Disagree
		3- Neutral
		4- Agree
		5- Strongly Agree
4	Ranking based on the field observations of records of workers' suggestions and the actions for continuous improvement of the EMP	1 - No mechanism appears to be in place to receive worker feedback, no record keeping and incorporate suggestions into continuous improvement
		2 - A mechanism appears to be in place to receive worker feedback (such as suggestion boxes), but no records or mechanism for mechanism appears to be in place to receive worker feedback
		3 - A mechanism to get worker feedback and records are maintained, but no evidence for incorporating worker suggestions into continuous improvement
		4 - A mechanism to get worker feedback and records are available, some evidences for

Parameter Code	Evaluated Method	Description of the rating criteria
		incorporating worker suggestions into continuous improvement
		5 - A well-functioning mechanism to obtain, maintain and incorporate worker suggestions for continuous improvement is available
5	Rating based on the records of training programs conducted by the management and attendance records of workers for trainings.	1 - No physical or documentary evidences for conducting training programs
		2 - At least 5 training program per year, poor worker attendance
		3 - At least 10 training programs per year, moderate worker attendance
		4 - At least 15 training programs per year, satisfactory worker attendance
		5 - More than 20 training program per year, good worker attendance
6	Rating based on the observations made on contract documents signed with outside suppliers, contractors and service providers.	1 - Documentary evidences are unavailable
		2- Documents are sparsely maintained, environmental safeguard measures are not incorporated
		3 - Documents are well-maintained but environmental safeguard measures are not incorporated
		4 - Documents are well-maintained with some evidence for incorporating environmental safeguard measures into contract documents (guidelines not well-specified)
		5 - Documents are properly maintained and environmental safeguards measures and guidelines are clearly specified in contract documents
7	Rating based on field observations of non- compliances and documentary evidences of complaints/non-compliances with applicable environmental regulations in the country	1- Non-compliance with major environmental regulations (no EPL)
		2- EPL has been obtained, but not renewed properly
		3- Valid EPL is available, non-compliance or no monitoring records of discharge water quality of the factory

Parameter Code	Evaluated Method	Description of the rating criteria
		4- Valid EPL is available, inadequate monitoring records and non-compliance with discharge water quality standards
		5- Compliance with all major environmental regulations with up-to-date monitoring
8	Rating based on the field observations, site maps and documentary evidence of buffer zones.	1- No buffer zones
		2- buffer zones are maintained demarcations are not clear
		3- Buffer zones are maintained but not enough
		4- Buffer zones are maintained but not clear in some of sensitive areas
		5- Buffer zones are properly demarcated
9	Rating based on the field observations, site maps and documentary evidence of implementing conservation programs	1 - No HCV ecosystems documented or physically identified
		2 - Only documentary evidence, no physical demarcation of HCV ecosystems
		3 - HCV ecosystems identified on paper and demarcated on the ground, but the criteria used to identify HCV ecosystems is inappropriate/not scientific
		4 - HCV ecosystems are scientifically identified but some lapses in implementing on the ground
		5- HCV ecosystems are scientifically identified and adequately protected
10	Rating based on the interviews with the workers/worker opinions (increase in the abundance of leaches, reptiles and amphibians were used as indicators)	1- Strongly Disagree
		2- Disagree
		3- Neutral
		4- Agree
		5- Strongly Agree
11	Rating based on the records of wildlife offences and workers/worker opinions.	1- Wildlife crimes have highly increased after certification
		2- Wildlife crimes have somewhat increased after certification
		3- No noticeable change in wildlife crimes after certification
		4- Wildlife crimes have somewhat decreased after certification
		5- Wildlife crimes have significantly decreased after certification

Parameter Code	Evaluated Method	Description of the rating criteria
12	Rating based on the field observations, animal observation record books/documentary evidence on sighting of rare and endangered wildlife	1- Wildlife sightings have decreased after certification
		1- No noticeable change in wildlife sightings/abundance after certification
		3- Wildlife sightings have increased by 1-10% after certification
		4- Wildlife sightings have increased by 11-20% after certification
		5- Wildlife sightings have increased over 20% after certification
13	Rating based on the interviews with the workers/worker opinions on wildlife conservation	1- Very poor awareness
		2- Poor awareness
		3- Neutral
		4- Satisfactorily aware
		5- Highly aware
14	Rating based on records of awareness programs on biodiversity and display of sign boards to raise awareness	1- No documentary or physical evidence on training or sign boards
		2- Documentary evidence suggesting some training, but no physical evidences on the field such as sign boards
		3- Sufficient training records, inadequate sign boards and field awareness
		4- Sufficient training records and sign boards, but inadequate field awareness
		5- Sufficient documentary and field evidences on measures taken to conserve biodiversity through raising awareness
15	Rating based on partial information available on metered water usage.	1- Water consumption has increased by more than 20% compared to baseline year
		2- Water consumption has increased by 5 to 20% compared to baseline year
		3- No significant change in water usage compared to baseline year
		4- Water consumption has decreased by 5 to 20% compared to baseline year
		5- Water consumption has decreased by more than 20% compared to baseline year
	Rating based documentary evidences on water quality	1- No water quality analysis reports available
		2- Water quality reports available in inadequate frequencies, some parameters not up to standard

Parameter Code	Evaluated Method	Description of the rating criteria
16		3- Water quality reports available in inadequate frequencies, some parameters not up to standard
		4- Water quality reports available in adequate frequencies, some parameters not up to standard
		5- Water quality reports taken in appropriate frequencies, water quality is up to standard with considerable improvement after certification
17	Rating based on field observations of measures taken to protect drinking water sources (adequate use of measures such as cover of water sources, catchment protection, no-spray zone, proper drainage system for waste water disposal).	1- Very poor awareness
		2- Poor awareness
		3- Neutral
		4- Satisfactorily aware
		5- Highly aware
18	Rating based on the quality of the potable water and adequacy of the water supply for housing areas.	1- Highly dissatisfactory
		2- Dissatisfactory
		3- Acceptable
		4- Satisfactorily
		5- Highly satisfactory
19	Rating based on documentary evidences of worker complaints, increment of wages, payment of bonus, timely payment of EPF, ETF, pay sheets and payroll records	1- No records maintained on worker complaints, wages, payment of bonus, payment of EPF, ETF,
		2- Records available, but more than 50 worker complaints related to wages and payments, EPF, ETF and other payroll issues within a year, grievances not resolved
		3- Records available, 25-49 worker complaints related to wages and payments, EPF, ETF and other payroll issues, grievances not resolved
		4- Records available, 10-24 worker complaints related to wages and payments, EPF, ETF and other payroll issues within a year, At least half of the grievances resolved
		5- Records available, less than 10 worker complaints related to wages and payments, EPF, ETF and other payroll issues, grievances fully resolved
20		1- Strongly Disagree
		2- Disagree

Parameter Code	Evaluated Method	Description of the rating criteria
	Worker opinion on fair payment of wages and fair allocation of working hours	3- Neutral
		4- Agree
		5- Strongly Agree
21	Rating based on medical records of illnesses available at health centers and office	1- Increased by over 25% after certification
		2- Increased by 10 to 25% after certification
		3- No considerable change compared to baseline year
		4- Decreased by 10 to 25%after certification
		5- Decreased by over 25% after certification
22	Rating based on field observation and worker interviews on the use of PPEs	1- No PPEs provided for workers
		2- PPEs are provided, but insufficient and not worn by workers during the work
		3- Sufficient provision of PPEs, workers occasionally wear PPEs during work
		4- Sufficient provision of PPEs, most of the PPEs are properly worn but some equipment are not used
		5- Sufficient provision of PPEs, PPEs are properly worn by all workers during the work
23	Rating based on the presence of an emergency response plan and equipment	1- No emergency response plan or equipment
		2- Emergency response plan is in place, but not implemented, no equipment
		3- Emergency response plan is in place, but lapses in implementation, insufficient equipment
		4- A good emergency response plan is in place with sufficient equipment, workers need more awareness
		5 - A good emergency response plan is in place with sufficient equipment, workers are aware of the plan
24	Rating based on the quality and adequacy of community centers, play grounds, other cooperative societies, temples in the area, and allocation of funds for welfare.	1- No any facility for community requirements.
		2- Some Facilities are provided but not sufficient
		3- Some facilities are there but no any improvements after certification
		4- Facilities for community requirements are provided but some of facilities have to improve
		5- All facilities for community requirements are provided and sufficient

Parameter Code	Evaluated Method	Description of the rating criteria
25	Rating based on school attendance statistics and completion of national examinations.	1- No considerable Improvements compared to baseline year
		2- less than 10% of increase in school attendance compared to baseline year
		3- About 11-25% increase in school attendance and completion of national exams compared to baseline year
		4- 26-50% increase in school attendance and completion of national exams compared to baseline year
		5- More than 50% increase in school attendance and completion of national exams compared to baseline year
26	Rating based on the percentage increase of the funds allocated for social welfare.	1 – No noticeable increase compared to baseline year
		2 – Up to 5 % increase compared to baseline year
		3 – About 6-10 % increase compared to baseline year
		4 – About 11- 20 % increase compared to baseline year
		5 – Over 20 % increase compared to baseline year
27	Rating based field observations of the presence of construction of terraces, ditches, live fences, and construction of soil conservation structures.	1- No soil conservative structures
		2- Soil conservative structures are there in some areas. But inadequate and poorly maintained
		3- Soil conservative structures are available, but insufficient
		4- Soil conservative structures are sufficient but not well-maintained
		5- Conservative structures are adequate and properly maintained and sufficient.
28	Rating based on the mulching and maintenance of undergrowth.	1- No green cover. Soil is more than 50% exposure
		2- Natural green cover is there in some areas. But no improvements after certification.
		3- Green cover is maintained but not sufficient
		4- Green cover is sufficient but soil is exposure in some areas.
		5- Green cover is properly maintain in every cultivated area

Parameter Code	Evaluated Method	Description of the rating criteria
29	Rating based on field observations on adequate implementation of waste management strategies	1- No any improvements have been introduced
		2- Improvement mechanisms are not sufficient
		3- Improvements have been introduced but no continuation
		4- Waste management strategies are satisfactory and continuing, some lapses
		5- Waste management strategies are satisfactory and continuing, only minor lapses

Chapter 03

Outcomes of the Impact Assessment

Results

This chapter discusses the results from qualitative and quantitative analysis of impact attributes measured during the study. The analysis and results are based on best available information, but certain attributes were highly subjected to data limitations due to the practical difficulties of retrieving reliable and unbiased data from existing records. Hence, the results were cautiously interpreted along with their limitations. The findings are presented by SAN principle.

Sample Profile

A total of 19 RF certified estates constituted the study sample. The sample selection took into account the year of certification and geographical location of estates (main tea-producing region). Accordingly, the sample represented estates from high-grown, mid grown and low-grown regions. The profile of estates selected following a stratified random sampling method is presented below.

Table 3: *Details of the estates in the study sample*

Estate	Region	Total Land Area (ha)	Tea Cultivated Area (ha)	No. of employees	RA certified year
A	Low Grown	482.49	339.41	486	2012
B	Low Grown	1,196.21	250.74	496	2011
C	Low Grown	26.52			2011
D	Mid Grown	683.94	221.62	320	2013
E	Mid Grown	663.89	134.44	317	2010
F	Mid Grown	550.63	238.08	372	2010
G	High Grown	668.38	516.20	1029	2011
H	High Grown	456.64	307.20	735	2012
I	High Grown	423.41	307.22	521	2011
J	High Grown	628.48	399.85	789	2011
K	High Grown	437.00	323.25	901	2014
L	High Grown	311.36	308.28	604	2011
M	High Grown	375.00	221.50	564	2011
N	High Grown		182.08	419	2011
O	High Grown	350.04	230.98	674	2013
P	High Grown	447.50	305.85	705	2013
Q	High Grown	381.18	251.32	867	2013
R	High Grown	236.00	134.04	342	2013
S	High Grown	304.75	218.30	485	2013

1. SAN certification impacts on Social and Environmental Management aspects (Principle 01)

Energy Consumption			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Factory & Estate			
Reduction in Electricity consumption [1]	1.2	⊛	Neutral
Adoption of energy efficiency measures [2]	3.6	⊛⊛⊛⊛	Positive
Worker households			
Electricity consumption has been reduced after SAN certification [3]	2.1	⊛⊛	Slightly positive
Alternative energy sources have been introduced after SAN certification [3]	4.2	⊛⊛⊛⊛	Positive
Social Management			
Worker suggestions have been incorporated into EMP improvements [4]	3.8	⊛⊛⊛⊛	Positive
Provision of environmental related training to workers [5]	3.5	⊛⊛⊛⊛	Positive
Environmental safeguard measures are incorporated into contractor and suppliers documents [6]	4.0	⊛⊛⊛⊛	Positive
Compliance with the national environmental regulations [7]	4.6	⊛⊛⊛⊛⊛	Positive

The adoption of SAN certification has resulted in reduction of energy consumption at factory and estate office premises. According to existing information at the sampled estates, on average, a 1% reduction in energy consumption (kWh) has been achieved. As the factory and buildings have electricity supply from multiple lines in all estates, and having numerous metered connections, power savings were not expressed in monitory values. Cumulative ratings received for the adoption of energy efficiency measures also yielded positive impact for all estates.

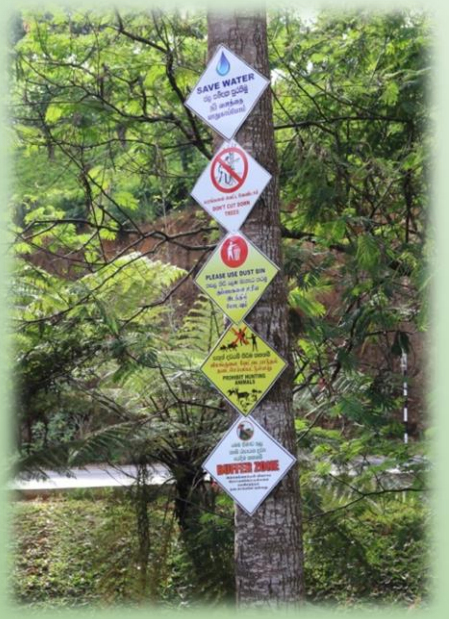
Interviews with worker households revealed that present electricity usage and energy bills have increased compared to baseline year. This is despite the estate management providing CFL or LED bulbs under concessionary schemes in many estates. Although this can be considered as a negative impact, the same information indicates the overall enhancement in living conditions and economic status of estate worker households.

2. SAN certification impacts on Ecosystem Conservation and Wildlife protection (Principles 2 & 3)

Ecosystem Conservation			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Maintenance of protective buffer zones [8]	4.0	⍟⍟⍟⍟	Positive
Identification and conservation of High Conservation Value ecosystems [9]	3.4	⍟⍟⍟	Neutral
Increase of indicator species [10]	3.1	⍟⍟⍟	Neutral
Wildlife Protection			
Wildlife crimes in the property have been substantially decreased [11]	4.8	⍟⍟⍟⍟⍟	Positive
Recording of rare and endangered species have increased [12]	3.2	⍟⍟⍟	Moderate
Community awareness on wildlife conservation has been increased [13]	4.6	⍟⍟⍟⍟⍟	Positive
Management has taken sufficient measures to aware the workers on wildlife conservation [14]	3.9	⍟⍟⍟⍟	Positive

SAN certification in general had a positive impact on preservation of native vegetation, biodiversity and preservation of ecologically sensitive areas such as watersheds and forests. The native forested patches inside estates have been properly identified, demarcated and mapped as required by SAN standard to ensure their conservation. Systematic biodiversity surveys have been carried out in all sampled estates. However, the criteria used to identify High Conservation Value Ecosystems in many cases were unclear or not scientifically sound. Designating whatever the remaining natural vegetation patches as HCVEs seem to be a common practice, which has led to negligence of more ecologically/environmentally sensitive areas.

No-spray zones/buffer zones have been adequately maintained in all sampled estates while the management has taken satisfactory measures to make the community aware on ecosystem and biodiversity conservation. The positive impacts of increased community awareness may be reflected by the substantial reduction of wildlife crimes/offences in estates. Interviews with workers particularly in low and mid country estates further revealed that populations of certain indicator species such as leaches, snakes and amphibians have increased due to the reduced chemical usage and adoption of environmental friendly weed management practices after adoption of SAN certification.



Awareness signs on display

Conservation of sensitive ecosystems

3. SAN certification impacts on Water conservation (Principle 4)

Water Conservation			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Annual water consumption has decreased after certification [15]	2.8	⍟⍟	Neutral
Quality of drinking water and waste water has been increased [16]	4.2	⍟⍟⍟⍟	Positive
Implementation of safeguard measures to prevent contamination of drinking water sources [17]	4.4	⍟⍟⍟⍟	Positive

According to the results of office and household surveys, improvement of the quality of drinking water as well as waste water can be identified as a positive impact of SAN certification. New domestic water supply schemes and improvement of existing community water supply schemes have been implemented by the estate management. All estates in the sample have conducted water quality testing in appropriate frequencies/time intervals and maintained their records. As a result of the special emphasis on water source protection, water quality has substantially improved compared to baseline (with over 70% of the sample meeting potable/drinking water standards).

Majority of the worker community also expressed their satisfaction over provision of safe drinking water and emphasized the declined number of cases of waterborne diseases in the recent past. Field observations further confirmed that safeguard measures such as covering the water

sources, proper drainage around water sources and demarcation of no-spray zones have been satisfactorily implemented by the estate management to reduce water source contaminations.

A water filtration structure

Available records suggest that the water consumption has increased, both in estates (factory and office) and households compared to the baseline year. Increase of domestic water usage may be explained by provision of new water supply schemes and improvements to existing water supply schemes. However, available water usage records contradict the general perception of the estate management that "water usage has declined after certification". This claim could not be effectively validated due to the absence of records on water usage from all possible sources. During the field investigations, it was observed that all water connections do not possess usage meters in most estates and therefore, accurate usage records were unavailable. Acquiring water from multiple sources including natural springs and streams for factory and building premises was a common observation. Hence, it is difficult to estimate the actual water usage. The increase in water usage may be a result of installing new usage meters to monitor the water usage, as emphasized by SAN certification guidelines.

Measures taken to protect drinking water sources in a SAN certified estates

4. SAN certification impacts on fair treatment and providing good working conditions for workers (Principle 05)

Fair treatment and Good working conditions			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Management has taken necessary measures to provide potable water for worker households [18]	4.0	⍟⍟⍟⍟	Positive
Workers have been paid according to existing labour laws and regulations in the country [19]	5.0	⍟⍟⍟⍟⍟	Positive
Working hours and payments for extra hours for permanent workers [20]	4.8	⍟⍟⍟⍟⍟	Positive
Sufficient toilet facilities and their maintenance/hygiene [3]	4.4	⍟⍟⍟⍟	Positive
Resting areas for field and factory workers [3]	4.4	⍟⍟⍟⍟	Positive

SAN certification in general had a positive and important impacts on improved working conditions in tea estates, not only because it has ensured workers' rights as envisaged by the legislation, but because it has provided for better housing and safety conditions at the workplace. Almost all the estates surveyed, had only permanent workers and all of them have been entered into the estate payroll. Documentary evidence further indicated that all employees have been paid on time, and contributions to EPF and ETF have been properly allocated. All workers have been allocated fair working hours and workloads. Increase of the daily wages compared to the baseline year was also evident in financial records. However, this may not be directly attributed to the SAN certification, and mostly influenced by political and trade union movements. Sufficient sanitation/toilet facilities, resting areas, and drinking water for workers have been provided in the field, factory and office premises of certified estates. In the lodgings, a somewhat positive impact of certification was also observed regarding the cleanliness of the rooms and space for workers to keep their belongings. However, these aspects needed further improvements in about 40% of the sampled estates.

Estate management have also recognized the workers' right to join and engage in trade union actions. The estate management was generally in the opinion that relationship between the management and workers have strengthened with the implementation of SAN certification. Better working conditions, worker welfare and awareness have positively contributed to this situation. According to estate managers, this has reflected in the reduced number of trade union actions against the management.

With regard to the conditions of the worker houses, certification had positive impacts on supply of clean, safe potable water. According to interviews with workers and field observations, housing conditions in many estates have improved compared to baseline year. However, improvement of household conditions is a conjuncture effect of several factors. Not all members of a single household are estate workers and a substantial number of non-workers are living inside estate properties. These individuals are employed outside estates and make significant earnings. However, in some certified estates, the worker housing conditions were still inappropriate. The expected impact of basic sanitary facilities and space for workers in the lodgings were less than ideal.

Lockers for factory workers

Resting sheds for Field workers

In all estates sampled, sufficient access to health services have been provided to workers through establishment of medical centres/clinics. In general, the estate management was in the opinion that improved health conditions of workers have positively affected on the productivity of workers.

Worker housing area in a certified estate

5. SAN certification impacts on Improvement of Occupational Health and Safety aspects (Principle 06)

Occupational Health and Safety			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Work related health problems have reduced after SAN certification [21]	4.6	⍟⍟⍟⍟⍟	Positive
Occupational safety awareness programs have been conducted by the management [5]	4.2	⍟⍟⍟⍟	Positive
Knowledge of workers on handling fuel, chemicals and hazardous waste improved [3]	4.8	⍟⍟⍟⍟⍟	Positive
PPEs are worn by workers during work [22]	4.2	⍟⍟⍟⍟	Positive
Emergency plan/equipment and worker awareness [23]	4.0	⍟⍟⍟⍟	Positive

The impact of SAN certification on safe pesticide handling, use and application was significant. The study detected that there was a positive impact on PPE use (especially in chemical spraying), appropriate washing and storage activities, and disposal of empty containers in all estates evaluated. According to statements made by most workers, trainings related to occupational health and safety has been adequately conducted in certified estates as a routine, and the workers are aware of correct handling and use of chemicals and PPEs. Field observations further detected the appropriate display of procedures in chemical handling and storage, warning signs and material safety sheets etc. Another positive impact of SAN certification was the reduced need for medical care/work-related accidents during working hours.

Washing/Bathing areas for chemical sprayers and proper storage of PPEs in SAN citified estates

However, it should be noted that although appropriate procedures and measures related to occupational health and safety are in place, there were few drawbacks in implementation. Interviews with workers revealed that some of them working in steep slopes found practical difficulties in using PPEs such as boots and coats. In about 50% of the estates visited, improper storage of different chemicals/fertilizers was observed. Some chemical storages lacked effective measures for spill prevention. Lack of ventilation in chemical storages was a common issue with about 60% of chemichal storages inspected revealing inadiquate ventilation. In many cases (about 25% of cases), it was observed that the chemical storage is located adjacent to either food storage or fuel storage.

All tea factories of estates visited, had emergency evacuation plans and fire assembly points at factory premises. However, some fire assembly points have been located too close to the factory and the assembly points were insufficient to accommodate all workers in case of an emergency. Some emergency exits inside the factories were improperly located. For instance, there were fire exits located toward the dryers where such devices can easily catch fire.

6. SAN certification impacts on better Community Relations (Principle 7)

Community relations			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Facilities provided by the management for cultural and religious activities [3]	4.2	⍟⍟⍟⍟	Positive
Activities to enhance education level of the community [3]	4.2	⍟⍟⍟⍟	positive
Allocation of funds by the management for community welfare [26]	3.2	⍟⍟	Moderate

Variability in chemical storage practices among certified estates

Contribution towards the community welfare has been increased as a result of SAN certification. The mean percentage funds allocated for welfare activities has been increased by 31% compared to baseline year. However, financial records indicate that items such as expenses on PPEs have also been included under welfare budget in several estates visited. Hence the actual change in the allocation of funds for community welfare could not be effectively traced. Construction of play grounds, child development centers and cultural centers were the main projects conducted by the management for the betterment of the workers and their families.

7. SAN certification impacts on Integrated Crop Management and Soil Management (Principles 8 and 9)

Integrated Crop Management and Soil Management			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Construction of soil conservation structures [27]	4.0	⍟⍟⍟⍟	Positive
Maintenance of green cover/ soil cover [28]	3.7	⍟⍟⍟⍟	Positive
Crop diversification in home gardens [3]	3.4	⍟⍟⍟	Moderate

SAN certified farms attempt to reduce the chemical and fertilizer use and instead focus on adoption of ecofriendly measure of soil enrichment, conservation and crop management. Accordingly, soil conservation best practices such as construction of contour drains (lock and spill type lateral drains), hedgerows, planting nitrogen-fixing (leguminous) plants along contour lines, maintaining an effective soil cover were commonly observed during field investigations. However, there was a significant variability in terms of their nature of implementation and effectiveness.

Weed management to retain a sufficient ground cover in certified lands

In few estates (approximately 30%), such measures have been implemented in a technically and scientifically sound manner while in majority of estates, their implementation is just above average. Since common soil conservation practices are implemented in all tea estates in sloping lands regardless of certification, the expected positive impact on soil conservation due to SAN certification is marginal. Integrated weed management methods have been implemented in several estates to varying success. A controlled weed cover is retained all times under this method.

The estate management in general had a neutral opinion on the effectiveness and viability of integrated weed and pest management practices implemented as a result of SAN certification. Increase of labor cost and strict restrictions on the use of many agrochemicals was a concern for them as it can inflate operational costs.

In all estates visited, less attention has been given on crop diversification. Other crops mainly included timber species managed for the purpose of fuel wood. Growing of other crops of economic importance was evident in worker housing areas. Many households owned small vegetable plots. Although these lands contribute to household income, most of them (about 70% of cases) were poorly managed, leading to possible soil erosion and sedimentation in waterways. Controlling such localized environmental issues are beyond the direct control of estate management.

Examples of proper implementation of soil conservation best practices in a certified estate which received highest ratings during field evaluations

8. SAN certification impacts on Waste Management Practices (Principle 10)

Waste Management			
Indicators & Measures	Mean Score	Improvement Rating	Impact
Waste management in estate			
Disposal of refuse tea/production waste [29]	3.1	⍟⍟⍟	Neutral
Solid waste management strategies at the factory and office premises [29]	4.6	⍟⍟⍟⍟⍟	Positive
Disposal of waste water from the factory [29]	4.8	⍟⍟⍟⍟⍟	Positive
Disposal of waste water from washing Machinery and vehicles [29]	4.0	⍟⍟⍟⍟	Positive
Waste management in worker households			
Sewage disposal from houses [29]	4.0	⍟⍟⍟⍟	Positive
Waste water disposal from houses [29]	4.0	⍟⍟⍟⍟	Positive

Waste management in factory and estate

SAN certification had a positive impact on all aspects of waste management, except management of waste from tea processing (refuse tea). Adoption of SAN certification has not caused any significant reduction in refuse tea production or improved the management of refuse tea as a waste product. This may be attributed to a combination of factors which include the type of machinery used, absence of good housekeeping practices, absence of space for disposal, and poor worker awareness.

A proper disposal method or environmental friendly management option was not evident in majority of the estates evaluated (over 65% of cases). Some estates sent their refuse tea to outside facilities for further recovery and used the rest for composting, while some others disposed waste within their own property. Majority of estates (78%) have implemented general solid waste segregation and management strategies within their factory, offices and fields at a satisfactory level.

Refused tea stacked for disposal estate

Waste water from washing of machinery/vehicles was often controlled through an outflow containment and filtration system in all the estates where such washing and maintenance services were performed on-site. All estates had a waste water treatment option for waste water coming from the factory, thus preventing possible soil and water contamination.

Waste management in worker households

Workers of certified estates generally cited cleaner homes and environment due to better waste management at household level. Despite few inappropriate practices in certified estates such as burning of garbage and disposal in open ditches, certification has had a positive overall impact, with room for further improvement. Composting of biodegradable waste was rather common in certified estates. However, open burning of non-biodegradable waste by worker households was evident in some residential areas.

Both satisfactory and inappropriate housekeeping practices were observed in certified estates

Settlement tanks with sand and gravel filters were the most commonly used methods for domestic waste water treatment in all certified estates inspected. Hence, certification had an overall positive impact on domestic waste water disposal. However, the functionality and maintenance of such treatment systems showed a considerable variability with approximately 30% of treatment tanks inspected found to be inappropriately maintained.

As for sanitary waste disposal, the positive impact identified was the provision of toilet facilities with septic tanks with the support of the estate management. Financial records maintained at administrative offices further indicated that estate management have invested more funds for the improvement of environmentally responsible solutions for waste management at worker household level with the implementation of SAN certification.

Poorly maintained and well maintained domestic waste water filtration systems observed in certified estates

9. SAN certification impacts on financial aspects

Profitability Analysis	Mean value for Baseline Year	Mean value for 2015	% Change	Impact/ Trend
Farm productivity				
Farm land (ha)	416.4	443.0	6.4	
Tea cultivated Farm land (ha)	303.4	293.1	-3.4	
Estate population	3077.1	3445.1	12.0	
No. of Workers	732.6	646.5	-11.8	Negative
Proportion of workers to total population	23.8	18.8	-5.0	Negative
Estate Green leaf production (kg/ha)	6,677.18	5,955.38	-10.81	Negative
Estate Made Tea (kg/ha)	1,681.98	1,625.80	-3.34	Negative
Total Made Tea (kg/year)	555551.0	556813.7	0.2	Positive
Estate Made Tea as a % of Estate green leaf	24.5	27.2	2.7	Positive
Fertilizer usage				
Annual fertilizer costs (Rs/ha)	24,823.65	8,703.00	-64.94	Positive
Extent of Fertilizer application (ha)	777.5	607.5	21.9	Positive
Fertilizer use (kg/ha)	405.96	396.76	-2.27	Positive
Chemical usage				
Annual Chemicals costs (Rs/ha)	721.23	1,322.58	83.3	Negative
Extent of Chemical application (ha)	873.2	628.3	-28.0	Positive
Chemical use (L/ha)	2.1	1.9	-10.2	Positive
Energy consumption				
Fuel wood for made tea (m^3/kg)	0.0053	0.0058	9.7	Negative
Electricity for made tea (Kwh/kg)	0.9	0.9	-0.8	Neutral

Profitability Analysis	Mean value for Baseline Year	Mean value for 2015	% Change	Impact/ Trend
Waste generation				
Refused Tea as a % of Total Made tea	0.916	0.909	0.11	Neutral
Other costs				
PPE (Rs)	77798.5	185524.8	138.5	Positive
Welfare + sports including	1484331.0	2005622.7	35.1	Positive

Impacts on productivity

Analysis of production statistics suggest that the productivity of certified tea estates have declined compared to the baseline year. The average tea cultivated land extent of the certified estates showed a 3.4% decrease in 2015 compared to the baseline. However, this may be predominantly due to the changes in the international business environment that affected the tea sector and long-term loss of productivity of tea lands due to deteriorating soils and adverse climatic conditions.

Results further indicated a 10.8% drop in estate green leaves production per hectare (kg/ha). Adoringly, the estate made tea per hectare also showed a decline by about 3.3% compared to the baseline. This may be mainly attributed to several factors including climatic variations, price fluctuations, labor and other management issues. It was further revealed that fertilizer and chemical applications have declined after estates become SAN certified. This in-turn may also affect the productivity of tea lands to a certain extent.

Although the average estate population has increased over the years, number of estate employees declined by 11.8%. Furthermore, the proportion of workers to total estate population has also declined substantially (5% reduction). These changes are a cumulative impact of several socio-economic changes and cannot be interpreted as a direct and significant impact of SAN certification. There is a growing trend among the younger generation of estate worker communities to seek employment outside the estate. This scenario is buttressed by improved socio-economic conditions, education, and attitudinal changes of younger generation.

It was further observed that despite the overall decline of production of estate green leaf quantity, the total production level has increased due to purchasing of green leaves from other sources.

Fertilizer and chemical usage

It was cumbersome to accurately determine and isolate the direct impacts of SAN certification on production costs due to high variability in recording and book-keeping practices used in estates. Moreover, it was difficult to have access to production and processing costs and profits to systematize the corresponding data.

According to available data, the average annual fertilizer cost of estates included in the sample has significantly declined from Rs. 24,823.65/ha to Rs. 8,703.00/ha; a 65% reduction. However, it should be mentioned that this figure may have been highly skewed by limited data available for the analysis. Nonetheless, a decline in fertilizer cost have been achieved. SAN certification discourages the use of chemical fertilizers and recent changes in Government policy of discouraging chemical fertilizers in agriculture and reduction of the fertilize subsidy may have also influenced this decline.

The extent of fertilizer application has also decreased by almost 22% while the average fertilizer usage per hectare has reduced from 2.27 percent. The substantial decline of fertilizer cost could be partially attributed to the changes in fertilizer subsidy policy of the SL Government occurred during the study period. However, decline of the extent of fertilizer application and average fertilizer usage per hectare hints the positive influence of SAN certification in reducing the costs incurred for fertilizers.

In contrast, annual chemical cost per hectare has increased by 83.3% compared to the baseline year. This is despite a 10% reduction in the quantity of chemicals applied per hectare. Although SAN certification might have played a part, this substantial cost increase may be better explained by the SL Government's recent decision to ban some of the low cost agrochemicals that were heavily used in agriculture. For instance, Government's blanket ban of glyphosate-based weedicides in May 2015 has a strong correlation with inflation of cost of chemicals. However, the 28% decline in the extent of chemical application and 10.2% reduction of average chemical usage per hectare signal the positive impacts of SAN certification in reducing the cost on chemicals. Reduced use of agrochemicals further benefit the environment in the long-run.

Energy Consumption

Boilers in tea factories are mainly operated using wood fuel. Wood fuel consumption showed a slight increase compared to the baseline. The rising cost of electricity may have encouraged factories to rely more on low-cost alternative energy sources. Electricity (kWh) used to produce a 1kg of tea did not show any significant variation.

Finances

It was not possible to accurately identify the impacts of SAN certification on finances due to the wide range of products produced, difficulty of accessing production and processing costs, compounding effects of other variables, amalgamation of several cost items under a single category in maintaining accounts, and the difficulty of systematizing the corresponding data. For instance, it was observed that cost of PPEs is often listed under welfare costs.

Chapter 04

Concluding Remarks

Conclusions

Findings of this study suggest that SAN certification has made some important socio-environmental impacts on Sri Lanka's tea estates. Although there are few negative aspects felt by the tea estates, the study found that SAN certification is an effective tool to minimize the social and environmental impacts of tea farming. The study highlights the importance of SAN certification in terms of worker health and security, capacity building, responsible use of pesticides and agrochemicals, natural resource conservation and community relations, and proves that benefits of certification greatly outweigh the costs, especially in the long-run.

SAN certification particularly had following positive impacts;

- ✓ Promoted the adoption of energy efficiency measures in tea estates and worker households
- ✓ Environmental safeguard policy and measures of environmental protection conveying to associated contractors and suppliers
- ✓ Community awareness of environment and wildlife conservation
- ✓ Better living and working conditions for workers
- ✓ Continual training and awareness programs for estate staff and communities
- ✓ Reduction of health issues and work-related accidents which in turn, indirectly contributing to the increased worker productivity
- ✓ Management supporting the community welfare activities
- ✓ Better education for estate communities
- ✓ Implementation of responsible solid waste disposal and waste water treatment mechanisms

Although not clearly reflected in the results, some of the commonly sighted negative aspects of SAN certification included the rise in labor costs due to reduced chemical usage, increase in fuel wood usage especially in factories, absence of eco-friendly means of disposing refused tea and ash produced in boilers.

The actual impacts of SAN certification on profits and costs could not be accurately validated due to data limitations. However, estate managers were generally in the opinion that although SAN certification may involve initial costs, the investment is worth in the long-run both socio-environmentally and economically. Hence from the business point of view, SAN certification should not be viewed only as a marketing tool to find price premiums. Other benefits of SAN certification such as cost savings through improved production and processing, increase in overall efficiency through better management, deflecting a negative image of the industry, and contributing to environmental protection should be effectively communicated.

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