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A Sustainability Standard for Chile's Agriculture Sector

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List of acronyms

AmiChile	Asociación de Mitilicultores de Chile (Mussel Farmer Association of Chile)
APA	Asociación de Productores Avícolas de Chile (Poultry Producers Association of Chile)
ASC	Aquaculture Stewardship Council
ASOEX	Asociación de Exportadores de Frutas de Chile (Fruit Exporters Association of Chile)
ASPROCER	Asociación de Productores de Cerdo (Pork Producers Association)
BPV	Benefit Present Value
BRC	British Retail Consortium
BSCI	Business Social Compliance Initiative
CBA	Cost–Benefit Analysis
CCB	Climate, Community and Biodiversity
CENEM	Centro de Envases y Embalajes de Chile (Packaging Centre of Chile)
CORFO	Corporación de Fomento de la Producción (Production Development Corporation)
CPA	Clean Production Agreement
CPL	Consejo Nacional de Producción Limpia (National Clean Production Council)
CPV	Cost Present Value
DIRECON	Dirección General de Relaciones Económicas Internacionales (General Directorate of International Economic Relations)
ECLAC	Economic Commission for Latin America and the Caribbean
ETI	Ethical Trading Initiative
EU	European Union
FAO	Food and Agriculture Organization
FDF	Fundación para el Desarrollo Frutícula (Foundation for the Development of the Fruit Industry)
FLO	Fairtrade Label Organization
FMS	Food Management System
FOB	Free on Board
FSC	Forest Stewardship Council
G.A.P.	Good Agricultural Practices
GDP	Gross Domestic Product
GE	Green Economy
GE-TOP	Green Economy and Trade Opportunities Project
GMP	Good Manufacturing Practices
GRI	Global Reporting Initiative
ICCO	International Cocoa Organization
IDIEM	Investigación, Desarrollo e Innovación de Estructuras y Materiales (Centre for Investigation, Development and Innovation of Structures and Materials)
IEA	International Energy Agency
IFOAM	International Federation of Organic Agriculture Movements (since 2015: IFOAM Organics International)
IFS	International Featured Standards
IMAFLORA	Instituto de Manejo e Certificação Florestal (Institute for Forest Management and Certification)
INDAP	Instituto de Desarrollo Agropecuario (Agriculture and Livestock Development Institute)
INE	Instituto Nacional de Estadística (National Statistics Institute)
ISCC	International Sustainability and Carbon Certification
ISEAL	International Social and Environmental Accreditation and Labelling Alliance
ISO	International Organization for Standardization
ITC	International Trade Centre
LCA	Life Cycle Analysis
LULUCF	Land Use, Land Use Change and Forestry
MPS	Milieu Project Sierteelt (Environmental Horticulture Project)
NAMAs	Nationally Appropriate Mitigation Actions
NGO	Non-Governmental Organization
NPSCP	National Programme of Sustainable Consumption and Production
NPV	Net present value
NSF	National Sanitation Foundation

ODECU	Organización de Consumidores y Usuarios de Chile (Consumers and Users Organization of Chile)
ODEPA	Oficina de Estudios y Políticas Agrarias (Office for Agricultural Studies and Policies)
OECD	Organization for Economic Co-operation and Development
PM	Particulate matter
SAI	Sustainable Agriculture Initiative
SAFA	Sustainability Assessment of Food and Agriculture Systems
SAG	Servicio Agrícola y Ganadero (Agriculture and Livestock Service)
SCP	Sustainable Consumption and Production
SERNAC	Servicio Nacional del Consumidor (National Consumers' Service)
SMETA	Sedex Members Ethical Trade Audit
SQF	Safe Quality Food
TEEB	The Economics of Ecosystems and Biodiversity
TPP	Trans-Pacific Partnership
UK	United Kingdom
UNEP	United Nations Environment Programme
USA	United States of America
USDA	United States Department of Agriculture
VCS	Verified Carbon Standard
WDI	World Development Indicators
WFTO	World Fair Trade Organization
WTO	World Trade Organization
WWF	World Wide Fund for Nature

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Executive Summary

This study identifies the challenges that are currently hampering the export of agricultural products from Chile, and assesses opportunities to make use of sustainability standards to overcome these challenges. With this purpose, the study provides an overview of the existing Chilean and international sustainability standards and their main characteristics, and identifies implementation and knowledge gaps that need to be addressed in order to establish a sustainability standard for Chilean agricultural export products.

The agricultural sector makes up 3.3 per cent of national GDP and produces around 8.4 per cent of Chile's exports. The sector also employs 8.4 per cent of the population and consists mostly of small and medium-sized companies. In the agricultural sector, such small and medium-sized companies are amongst the most vulnerable to economic and environmental risks resulting from climate change and biodiversity loss. At the same time, agriculture is responsible for an important proportion of greenhouse gas emissions, and for other problems, such as soil degradation and the depletion of water resources.

This study used two methodological approaches. First, a literature review identified 31 relevant international and 5 Chilean sustainability initiatives, such as standards and eco-labels. The study analyzed their main characteristics, and for the international initiatives, it assessed to what extent they were applicable to the Chilean reality. The second was the constant engagement of stakeholders in the analysis in order to include their opinions and experiences related to sustainability standards. This was done through three workshops, which took place in 2015 and gathered participants from the public sector, the private sector, international organizations and sustainability initiatives.

The study found that there are over 460 sustainability standards, eco-labels or similar initiatives worldwide, and that Chilean agricultural producers engaged in export can choose from 37 different standards. In Chile itself, the most relevant initiatives include organic certification, Chile G.A.P., the Wine Industry Sustainability Code, the Clean Production Agreements and ODEPA's Sustainable Agriculture Protocol. In general, compliance with Chilean or international initiatives is not widespread, due to a lack of resources, a lack of knowledge, and the fact that each of these initiatives uses different requirements. However, increased compliance with sustainability initiatives has the potential to provide companies, and the country, with the benefits of increased international trade, and could allow the country to reap the associated environmental and social benefits.

When analyzing the different benefits that sustainability standards can generate, the study divided them in two categories: added benefits and avoided costs. Further distinctions can be made between private and public sector benefits, and economic, social and environmental benefits or avoided costs. However, sustainability standards do not come without a cost, and a next step would be to compare the avoided costs and added benefits to the cost of implementing a sustainability standard. For this reason, this study includes a short guide, outlining how to perform a more quantitative assessment of this type of initiatives.

When analyzing the characteristics of the 31 international initiatives which are relevant for Chile, there are certain patterns that emerge and which can guide the design of a national sustainability standard. For example, most of the initiatives are led by the private sector and very few by the public sector. Most of them are verified by a third independent party, which enhances their credibility. The majority of initiatives adopt a combination of social and environmental requirements. Some of these requirements are defined as being critical, which means that they need to be met if certification is to be provided, while other initiatives offer the opportunity to implement corrective actions within a certain period of time. Since the initiatives are related to agricultural products, these normally cover the production/extraction and the conversion/processing stages, which are usually the most relevant in terms of economic and social indicators.

The expected level of change also depends on the objectives. This can be "high bar" or "entry level", where the first is set to reflect the best practices, while the latter only focuses on eliminating the least desirable ones. According to this study and the stakeholders consulted, "high bar" would be a more valid choice than "entry level", because of the higher credibility it can generate in international markets.

Another relevant element is the focus of the standard, which can centre on "final results",for example, a concrete reduction of greenhouse gas emissions. The alternative is a process-centred focus, which specifies

the good practice to be followed. With consumer credibility in mind, "final results" was found to be a more adequate alternative.

There are some characteristics where the analysis was inconclusive. In these few cases, the stakeholder consultation process was crucial. From these consultations emerged the conclusion that a standard would be the most suitable way of supporting the export of Chilean agricultural products, mainly because a standard implies a verification process, unlike a protocol that is merely a guidance document and, therefore, cannot provide guarantees to international consumers. However, as an option to enhance the performance of the industry, the adoption of a protocol should not be ruled out, especially for public initiatives that aim to encourage the adoption of better practices in the entire industry, like ODEPA's Sustainable Agriculture Protocol.

The study highlights the high amount of sustainability initiatives in Chile and in the world. For this reason, there is no need to create a new eco-label with its own requirements. Rather, there is a need to harmonize the plethora of initiatives so that it is easier for producers to get certified in the initiative or eco-label that they deem is the most advantageous for their target markets. Producers (and later consumers) should be provided with better information, so they can easily improve their sustainability performance, and eventually be certified. This can be done through an online platform owned either by a Non-Governmental Organization (NGO), a public organism, a private organization, or a combination of these.

As further steps, the first and most relevant is the establishment of a pilot project that can test the findings of the study in the field. This pilot will aim to provide technical capacity building to an industry to be selected, working through its industry association, in order to enable the adoption of existing sustainability standards. The objective of the project would be to improve the knowledge regarding the available standards (including on leading standards by industry and destination market), their market access potential, cost information, their specific requirements and compliance mechanisms, and the formalities and timeframes for obtaining certification.

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1 Introduction

1.1 Background

Trade is an important component of the international economy. World exports of goods and services grew by 5.3 per cent per annum between 1993 and 2013, reaching US$ 18.8 trillion by the end of that year. In the same period, the expansion of trade has been more than twice the average GDP growth rate worldwide, which was around 2.5 per cent (WTO, 2014). International trade can also foster the exchange of environmentally friendly goods and services, increase resource efficiency, open new export markets, and generate economic opportunities and employment. As such, international trade can facilitate the transition to a green economy, an economy that improves human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011).

The Green Economy and Trade Opportunities Project (GE-TOP), funded by the European Commission, is an initiative of the Trade, Policy and Planning Unit of the United Nations Environment Programme (UNEP). The first phase of the project was the publication of the report "Green Economy & Trade: Trends, Challenges and Opportunities" (UNEP, 2013; See Box 1). Based on the results presented in this report, the second phase is undertaking national-level GE-TOP projects in five countries, including Ghana, Peru, South Africa, Vietnam and Chile.

Box 1: Green Economy & Trade: Trends, Challenges and Opportunities

The report "Green Economy and Trade – Trends, Challenges and Opportunities" (UNEP, 2013), the main outcome of Phase I of GE-TOP, assessed sustainable trade opportunities in six key sectors: agriculture, fisheries, forests, manufacturing, renewable energy and tourism. The report aimed to 1) identify a range of international trade opportunities in various key economic sectors associated with the transition to a green economy; 2) identify policies and measures that may act as facilitators to seizing trade opportunities arising from the transition to a green economy, and overcome related barriers; and 3) assist governments, the private sector and other stakeholders to build capacity to take advantage of sustainable trade opportunities at the national, regional or international level.

In Chile, the project aims to assess how a national standard or eco-labeling programme in agriculture could create sustainable trade opportunities. The project focuses on agriculture for several reasons. Firstly, it is the second largest export sector for the Chilean economy (Chilealimentos, 2014), and Chile is among the main exporters of several products. Besides, the agriculture sector is a major source of employment[1], and many of the producers in the sector are small or medium-sized farmers.[2] On the other hand, the sector is the second-largest source of greenhouse gas emissions, only surpassed by the energy sector (Ministerio del Medio Ambiente, 2011). The agricultural sector is also responsible for the highest water consumption (Ministry of Agriculture, 2013). Chile has committed to reduce its greenhouse gas emissions with 20 per cent by 2020, according to the 2007 trajectory (Ministry of Environment, 2011), and a better environmental performance is essential for the country, now that it is a member of the Organisation for Economic Co-operation and Development (OECD) (OECD and ECLAC, 2005). Finally, there is an important need to maintain the international competitiveness of the sector, while improving its social and environmental performance, as the country transitions towards a greener economy.

1.2 Objectives

The main objectives of this project are:

- To establish the importance of international trade for the Chilean economy;
- To establish the economic, social and environmental relevance of Chilean agriculture;
- To identify implementation and knowledge gaps that need to be addressed in order to establish a national sustainability standard or eco-label;
- To assess the opportunities and challenges for eco-labelled products to access international markets;
- To provide guidance on the assessment of the social, economic and environmental costs and benefits of such a standard or eco-label;
- To develop recommendations on the preferable characteristics of a national standard or eco-label;
- To compile the challenges and lessons learned for national standard or eco-label projects.

1.3 Methodology

The study has used two methodological approaches. First, the study undertook a literature review and identified relevant sustainability initiatives such as standards and eco-labels, in Chile and in the world. It listed the main characteristics of each of these initiatives and assessed how applicable they are to the Chilean reality. Secondly, the project consulted stakeholders to obtain their opinions and experiences related to sustainability standards or eco-labels. A more detailed description of each of the two approaches is presented below.

1 12 per cent of the Chilean workforce works in the agricultural sector, which offers around 700,000 permanent jobs (and more during summer) (ODEPA, 2005).
2 Over 40 per cent has less than 5 hectares (INE Chile, 2009).

1.3.1 Literature review and analysis

31 international initiatives were selected to be reviewed, according to different filters such as their relevance for Chilean agricultural exporters, their relevance as assessed by the different stakeholders consulted, and on the basis of information derived from Standards Map, an online platform of the International Trade Centre that compiles information on several of the initiatives. Another important source of information was ISEAL Alliance.[3]

Further information on the costs and benefits of different initiatives is provided in Section 4 of this report. For some of these initiatives, such as the Fairtrade Label Organization and the Rainforest Alliance, additional studies and evidence were used in order to better understand their social, environmental and economic benefits.

1.3.2 Stakeholder engagement

Stakeholder engagement was also key for this study. Stakeholders consulted included the public sector (including relevant ministries), the private sector (mostly through trade unions), experts and academia. The motivation for the extensive stakeholder engagement process was to gather practical lessons from a variety of actors active in sustainability standards or eco-labels, and to ensure the integration of the project with ongoing public and private initiatives, and vice versa.

A list of stakeholders consulted is presented in Table 1.

Table 1: List of stakeholders, type of institutions, and status of engagement

Name of Institution	Type	Description	Representing
ISEAL Alliance	International private non-profit organization	Non-governmental organization whose mission is to strengthen sustainability standards systems for the benefit of people and the environment	International NGOs
Centre for Investigation, Development and Innovation of Structures and Materials (IDIEM)	Private research institution	Research centre within the University of Chile with a vast experience in sustainable construction and certification of buildings	National academia
Ministry of Environment	Public organization	Ministry responsible for the design and implementation of environmental policies, plans and programmes	Public sector
Office for Agricultural Studies and Policies (ODEPA)	Public organization	Public service under the Ministry of Agriculture, whose mission is to provide information to regional, national and international actors in the agricultural sector	Public sector
Chilean Promotion Bureau (ProChile)	Public organization	Institution within the Ministry of International Affairs, in charge of the promotion of exports of Chilean goods and services	Public sector

3 ISEAL Alliance is a global membership association for sustainability standards with a wealth of information about their characteristics and the impacts they generate. Its main goals are: 1) to improve the impacts of standards; 2) to define the credibility of sustainability standards; 3) to increase the uptake of credible sustainability standards; and 4) to improve the effectiveness of standards. The list of members can be found here: http://www.isealalliance.org/our-members/full-members

Name of Institution	Type	Description	Representing
National Clean Production Council (CPL)	Public organization	A public–private entity of dialogue and collective work between the public sector, the companies and its workers, with the goal of modernizing and increasing the competitiveness of the manufacturing sector through cleaner production	Public–private
Fruit Exporters Association of Chile (ASOEX)	Trade association	Association whose mission is to support, facilitate and improve all processes related to the exports of fruit	Private sector
Federation of Chilean Fruit Exporters (Fedefruta)	Trade association	Non-profit organization relating with public and private organizations in order to satisfy the needs of the fruit and vegetable sector in terms of protection, outreach, training, research and certification	Private sector
Association of Food Companies of Chile (Chilealimentos)	Trade association	Mission: to promote a proper insertion of its associates in global markets, and to position Chile as a leader in competition and responsibility	Private sector
Association of Diary Exporters (Exporlac)	Trade association	Association aiming to increase Chilean dairy exports	Private sector
Pork and Poultry Producers Associations (ASPROCER/APA)	Trade association	Association whose main goal is to encourage technical, scientific and juridical initiatives that help the development of pork and chicken production	Private sector
Wines of Chile	Trade association	Organization committed to promoting the quality and image of Chilean wine throughout the world	Private sector
Mussel Farmer Association of Chile (AmiChile)	Trade association	Association whose mission is to encourage the development of the mussel activity in Chiloé, in southern Chile	Private sector
Salmon Industry Association (Salmón Chile)	Trade association	Association bringing together the main producers of Atlantic salmon, Coho salmon and trout, as well as their suppliers, with the aim of cooperating in order to meet the health, environmental, regulatory, social and economic challenges faced by the industry, both nationally and internationally	Private sector
Packaging Centre of Chile (CENEM)	Technical private non-profit corporation	Corporation gathering companies and institutions involved in packaging in Chile, with the objective to deliver value for its associates	Private sector
Consumers international	International private association	International federation of consumers' associations, aiming to ensure consumers' access to safe and sustainable goods and services	Consumers

Name of Institution	Type	Description	Representing
National Consumers' Service (SERNAC)	National Consumers' Service	State agency in charge of the protection of consumers' rights	Consumers
Consumers and Users Organization of Chile (ODECU)	Independent consumers' association	Organization defending and protecting consumers' rights	Consumers
Responsible Citizens Foundation	Foundation	Foundation aiming to install a culture of responsible consumption in Chile, encouraging responsible purchase and use of goods	Consumers
Fairtrade Label Organization International	NGO	NGO in charge of setting certification standards and capacitation for institutions seeking certification	Standard-setter
World Wide Fund for Nature (WWF Chile)	NGO	Institution supporting several standards, including the Aquaculture Stewardship Council (ASC)	Standard-supporter

Three workshops were organized (December 2014, March 2015 and August 2015), in order to collect the inputs of the abovementioned stakeholders. The first workshop was carried out by ISEAL Alliance and served mostly as an overview of standards/eco-labels, standard-setting and evaluation and monitoring. As this workshop was mostly introductory, stakeholders were invited from within and outside the domain of agricultural exports. Besides a selection of the stakeholders mentioned above, the participating organizations included Poch Ambiental, a consultancy specialized in sustainability, as well as the research institution Fraunhofer Chile, and Sodimac, a Chilean retailer of construction and home appliances.

The second workshop went more into detail about the design of a national standard or eco-label for the Chilean agriculture, based on the international and national experience of the participants. At the third workshop, the preliminary results of the characteristics of the standard/eco-label were presented and key inputs from stakeholders were gathered, which will be presented in the following subsection of the document. Table 2 presents the list of participants of the different workshops. The comments and opinions of the different stakeholders have been integrated throughout this document.

Table 2: Workshop participants

Workshop 1	Workshop 2	Workshop 3
ASPROCER/APA	CENEM	ASPROCER/APA
CPS	CPL	Chilealimentos
Fraunhofer Chile	Fairtrade Label Organization International	Comercial Soho (olive oil producer)
IDIEM	Fundación Chile – Food and Biotechnology	Envatec (detergent producer)
ISEAL Alliance	Ministry of Environment	ODEPA
ODEPA	ODEPA	ProChile
Poch Ambiental	Viñedos Emiliana	Viñedos Casa Donoso
ProChile	Wines of Chile	Wines of Chile
SODIMAC	WWF Chile	
UNEP		

1.4 Structure

The study will be structured as follows:

- Sections 2 and 3 will present the Chilean context of the study:
    - Section 2 sketches Chile's overall trade profile, and the work already in motion to improve the sustainability of Chile's economy.
    - Section 3 discusses the economic, social and environmental importance of agriculture for the Chilean economy, the challenges of the sector, and the potential benefits of a greener agricultural sector and sustainability standards.
- Section 4 assesses the different sustainability standards, both internationally and in Chile, and the opportunities they can create for the agricultural sector.
- Section 5 is the core of the study, presenting a series of sustainability standards and eco-labels and their main characteristics, which will ultimately help to define which are most suitable for Chilean agriculture exporters.
- Finally, section 6 contains conclusions, recommendations, and further steps.

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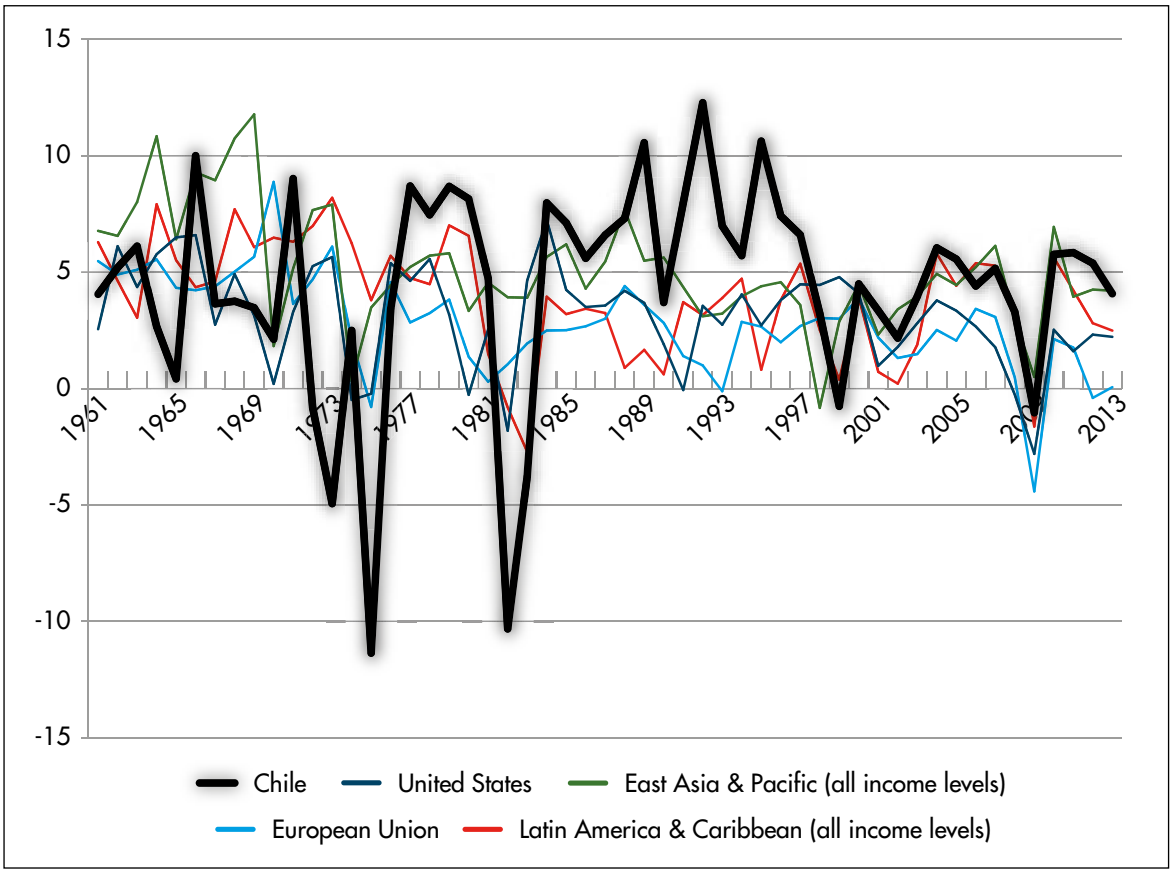
2 Country Profile

2.1 Economic and trade context

During most of the 20th century, Chile experienced limited and erratic GDP growth, sometimes below the average of the rest of Latin American countries (Government of Chile, 2013). GDP growth started to increase around the 1990s (see Figure 1), which can be explained by several factors (Solimano, 2009), including an increase in investment, an increase in national savings, an acceleration of total productivity growth, a steady overall decline in inflation, a shift from fiscal deficit to fiscal balance and surplus, a climate of political and social stability after the restoration of democracy in 1990, and a sharp rise in exports as a percentage of GDP (See Figure 2).

Figure 1: GDP growth (annual %) for selected countries and economic blocks



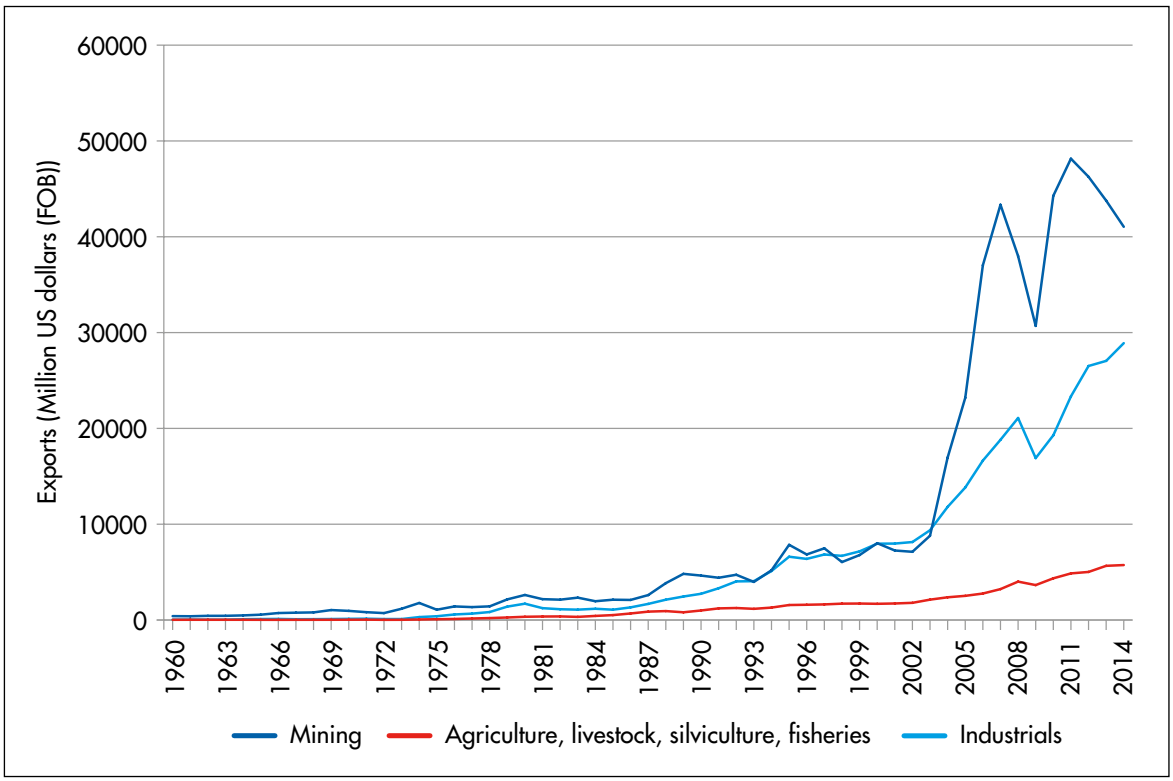
Source: Own elaboration with data from the World Bank (2015)

Figure 2: Export of goods and services (% of GDP)

Source: Own elaboration with data from the World Bank (2015)

The important upsurge in exports was to a large extent enabled by the unprecedented development of the mining industry (copper in particular), which itself was due to increased foreign investment in recognition of Chile's wealth of natural resources. The important rise of mining exports, from an average of US$ 2,670 million in the 1980s, to US$ 5,795 million in the 1990s and US$ 22,040 in the 2000s, is highlighted in Figure 3.

Figure 3: Chilean exports by sector (US million dollars, FOB)

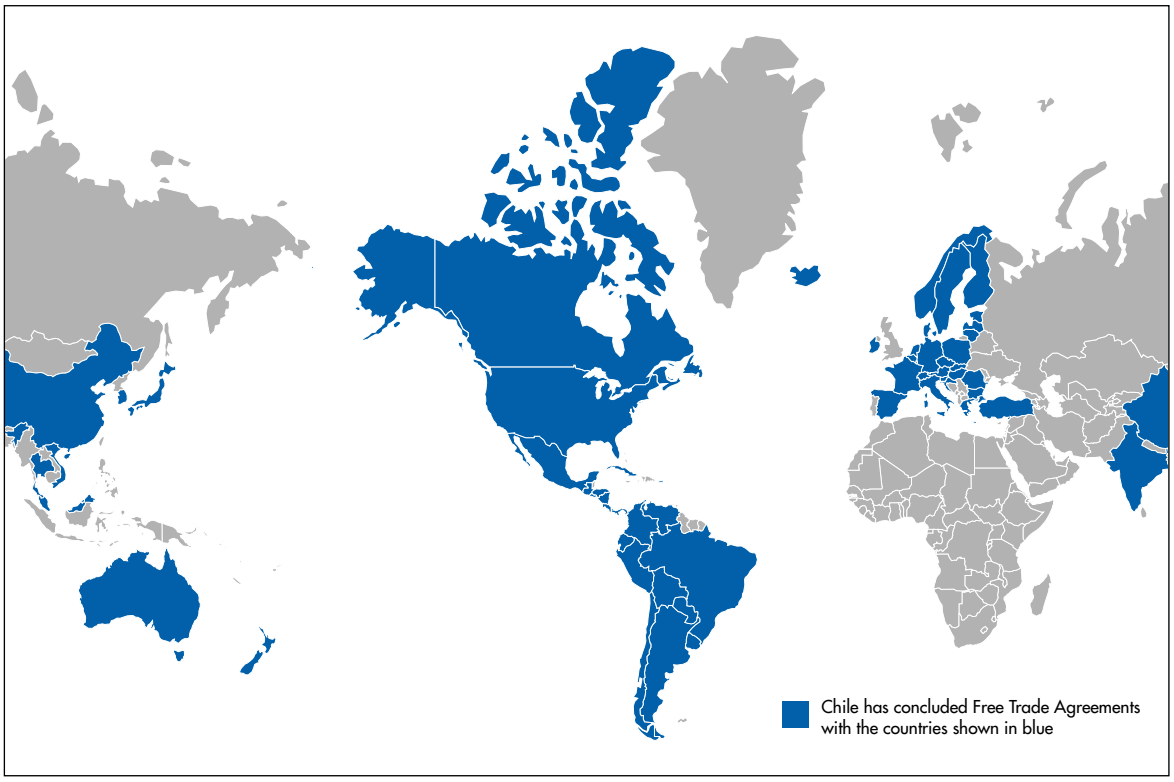


Source: Own elaboration with information from the database of the Banco Central de Chile

Mining is still one of the main sectors in the Chilean economy, but was not the only sector that has shown important growth in exports, as can be seen in Figure 3. The industrial, agricultural, livestock, forestry, and fishing sectors have also increased their exports consistently over time, be it more modestly than the mining sector. This overall growth can be explained by a significant rise worldwide in the demand for food products, which itself is related to higher purchasing power, population growth, and higher life expectancies, among others, but additionally, Chile made an important effort to increase its competitiveness by reducing tariff rates. To this end, it concluded several bilateral agreements, introduced a flexible exchange system accompanied by credible inflation goals, ensured the responsible handling of fiscal policy, and developed adequate infrastructure (such as ports, roads, etc.) (Government of Chile, 2013).

The signing of Free Trade Agreements with important foreign markets has enhanced Chile's international trade position. Figure 4 presents a map of the countries or regions with which Chile has free trade agreements, and illustrates the diversity of its trade partners. Table 3 shows more specific data about these trade agreements, including countries/regions, starting year and the volume of trade in 2014. The two most important trade relations (highlighted in Table 3) are China and the United States (USA). In fact, Asia accounts for 40.8 per cent of total Chilean trade, while North America represents 20.2 per cent. In the case of China, the agreement indicates that 97.2 per cent of Chilean products enter the country without custom duty, while 98.1 per cent of Chinese products enter Chile without custom duty. Since the agreement entered into force, Chilean exports have shown an average growth of 15 per cent per year (DIRECON, 2015a). Similarly, since the conclusion of the agreement with the USA, 100 per cent of Chilean products could enter the USA without custom duty, and bilateral trade has increased by an average 12 per cent between 2003 and 2014 (DIRECON, 2015b). Chilean products that have significantly increased their export volumes include fresh fruit and salmon. Most recently, Chile has become a participant of the Trans-Pacific Partnership (TPP), along with 11 countries, including Australia, Brunei, Canada, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, the USA and Vietnam. As of the beginning of 2016, the TPP has not yet entered into force.

Figure 4: Map showing the countries with which Chile has concluded a Free Trade Agreement



Source: DIRECON (n.d.)

Table 3: Chile's Free Trade Agreements and their respective starting years

Country or region	Entry into force	Commercial trade (thousand US$ – 2014)
Bolivia	1993	1,776
Venezuela	1993	541
Mercosur	1996	15,228
Canada	1997	2,498
Mexico	1999	3,744
Central America	2002	690
European Union	2003	21,317
United States	2004	23,532
South Korea	2004	6,997
European Free Trade Association	2004	1,289
China	2006	33,534
P4*	2006	360
Japan	2007	9,854
India	2007	3,302
Panama	2008	259
Cuba	2008	42

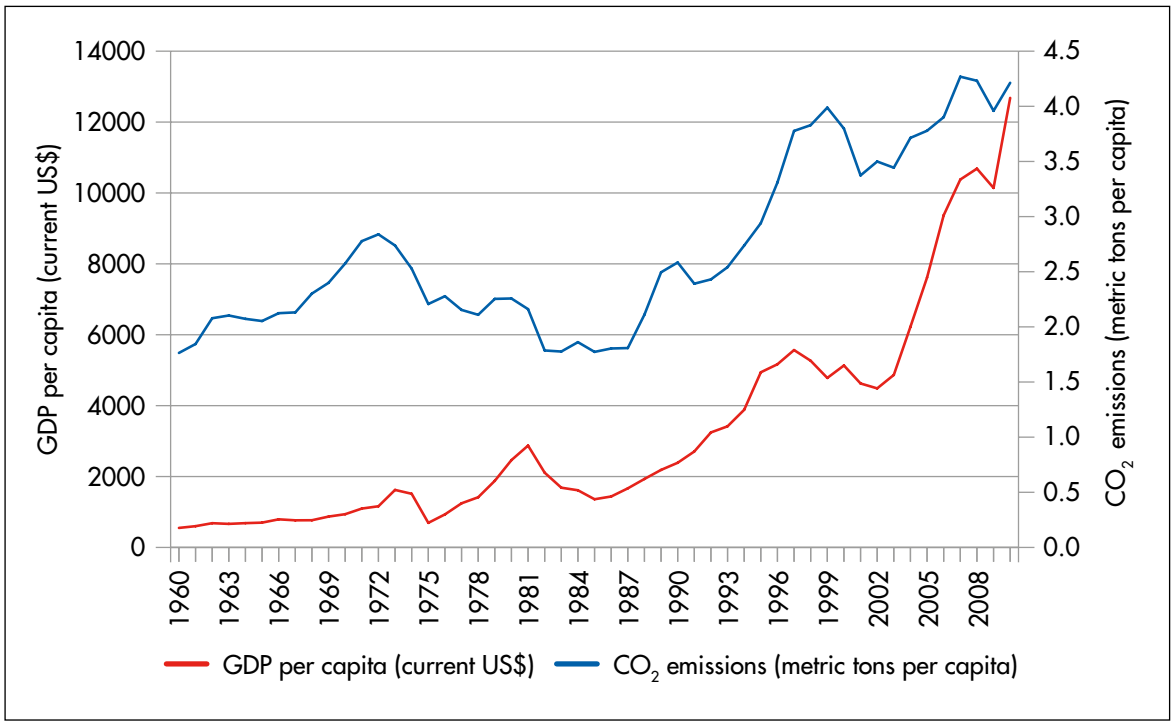
Country or region	Entry into force	Commercial trade (thousand US$ – 2014)
Peru	2009	3,390
Colombia	2009	2,033
Australia	2009	1,188
Ecuador	2010	2,951
Turkey	2011	592
Malaysia	2012	433
Vietnam	2014	762
Hong Kong	2014	318

* Chile, New Zealand, Singapore, Brunei Darussalam

2.2 Economic growth and use of resources

For long, Chile's economic growth has been coupled to growing environmental impacts. As an example, Figure 5 illustrates how GDP and CO_2 emissions per capita have been highly correlated since the 1980s.

Figure 5: Relationship between GDP and per capita CO_2 emissions in Chile



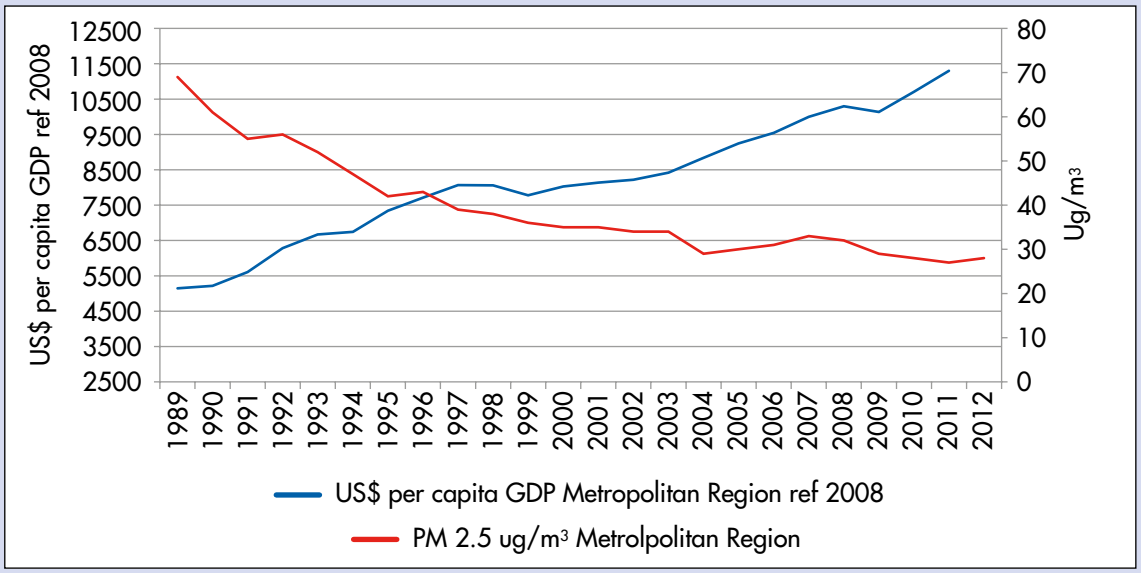
Source: Own elaboration with data from the World Bank (2015)

The importance of decoupling economic growth from environmental degradation became a priority for Chile since the country joined the OECD in 2010 and it became evident that it was far behind the other member states in terms of environmental indicators, such as the quality of air, water and soil (OECD and ECLAC, 2005). An interesting example of the successful decoupling of economic growth from pollution in the Metropolitan region is presented in Box 2.

Box 2: Santiago's Story: Decoupling economic growth from pollution

Chile's Metropolitan Region, where the capital Santiago is located, has historically suffered from high pollution rates, particularly high levels of fine particulate matter (2.5PM) which has a harmful effect on people's health. In reaction to these high concentrations, the authorities have implemented a number of environmental regulations, including the elimination of wood as a source of heating, the limitation of the number of vehicles in the streets, and tradable emission permits. Despite these regulations, which have more than halved 2.5PM concentrations between 1989 and 2012, the region has presented a sustained economic growth, from a little below US$ 5,500 per capita to close to US$ 11,500 per capita in the same period, as presented in the Figure below. Pollution will always be an issue in Santiago because of the level of centralization and the geographical conditions of the valley (with very dry winters), but the different measures implemented by the government have improved the situation since the 1980s and 1990s, without hindering economic growth.

Per capita GDP and concentration of 2.5 particulate matter in the Metropolitan region (1989–2012)



Source: Government of Chile (2013)

2.3 Chile and the Green Economy

When joining the OECD, this institution encouraged Chile to develop and commit to a National Green Growth Strategy in order to promote economic growth while protecting the environment, creating jobs, and encouraging social equity. The strategy was developed in 2013, in a joint effort by the Ministry of Finance and Ministry of Environment, and it is currently in the process of being updated. The original strategy has the following general objectives:

1. To promote economic growth and generate opportunities whilst committing to the sustainable management of natural resources, the implementation of adequate instruments for the internalization of environmental externalities, and the promotion of the national market of environmental goods and services.

2. To protect the constitutional right to an environment free of pollution, establishing minimum quality and environmental risk standards with clear and verifiable goals and realistic timeframes.

3. To continue developing the government's commitment to international efforts in the field of environment, considering shared and differentiated responsibilities, maintaining Chile's competitiveness, and reaffirming its integration into the global market.

4. To ensure the constitutional right of every person to access information held by the state administration and the right of individuals to have access to environmental information established in Law 19.300.

Figure 6 presents a summary of the three pillars of the Green Growth Strategy to achieve the four objectives. These pillars are:

a. Implementing environmental management instruments;

b. Promoting the market for environmental goods and services;

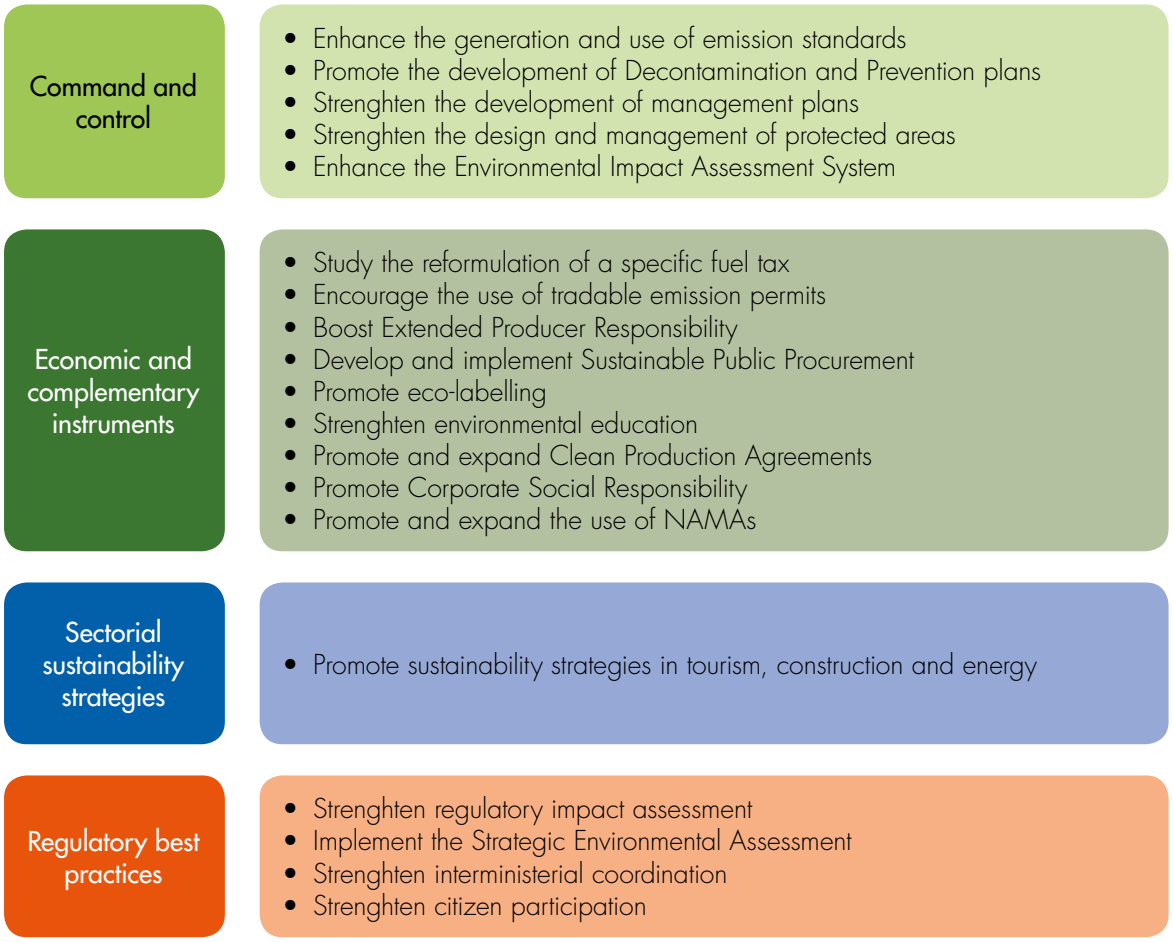
c. Monitoring and measuring the Strategy.

Figure 6: Chilean National Green Growth Strategy

Source: Government of Chile (2013)

The pillar of environmental management instruments has four axes and several lines of action for each of them, which are all summarized in Figure 7. One of the axes corresponds to economic and complementary instruments. Economic instruments for environmental protection are defined by UNEP as "policy approaches that encourage behaviour changes through their impact on market signals rather than through explicit directives regarding pollution control levels or methods or resource use" (UNEP, n.d.). These instruments include taxes, tradable permits or user fees that take the environmental and social costs into account that are implicit in the production or use of certain goods or services (OECD, 2011). Chile is a pioneer in the use of economic instruments, such as the trading of water rights (1981), tradable particulate emission permits in Santiago (1992) and individual transferable quotas for some fish species (1992). Nevertheless, as the government recognizes, these instruments could be used more. For this reason, the National Green Growth Strategy lists several lines of action.

Figure 7: Chilean National Green Growth Strategy. Implementation of environmental management instruments, axes and lines of actions



Source: Own elaboration with information from Government of Chile (2013)

One of the lines of action regarding economic instruments in the National Green Growth Strategy is the use of eco-labels, which are considered effective tools for providing information to consumers about sustainable products. Eco-labels also generate incentives for producers to reduce negative social and environmental impacts, whilst differentiating their product from competitors. The government has recognized the need to have an eco-label with clear and transparent criteria and categories, supported by government officials, backed by scientific studies and recognized by the private sector and the general population (Government of Chile, 2013).

Other benefits of sustainability standards and eco-labels are access to new markets and better positioning in current markets. With this in mind, this study assesses to what extent a standard or eco-label for Chilean agriculture can generate these benefits.

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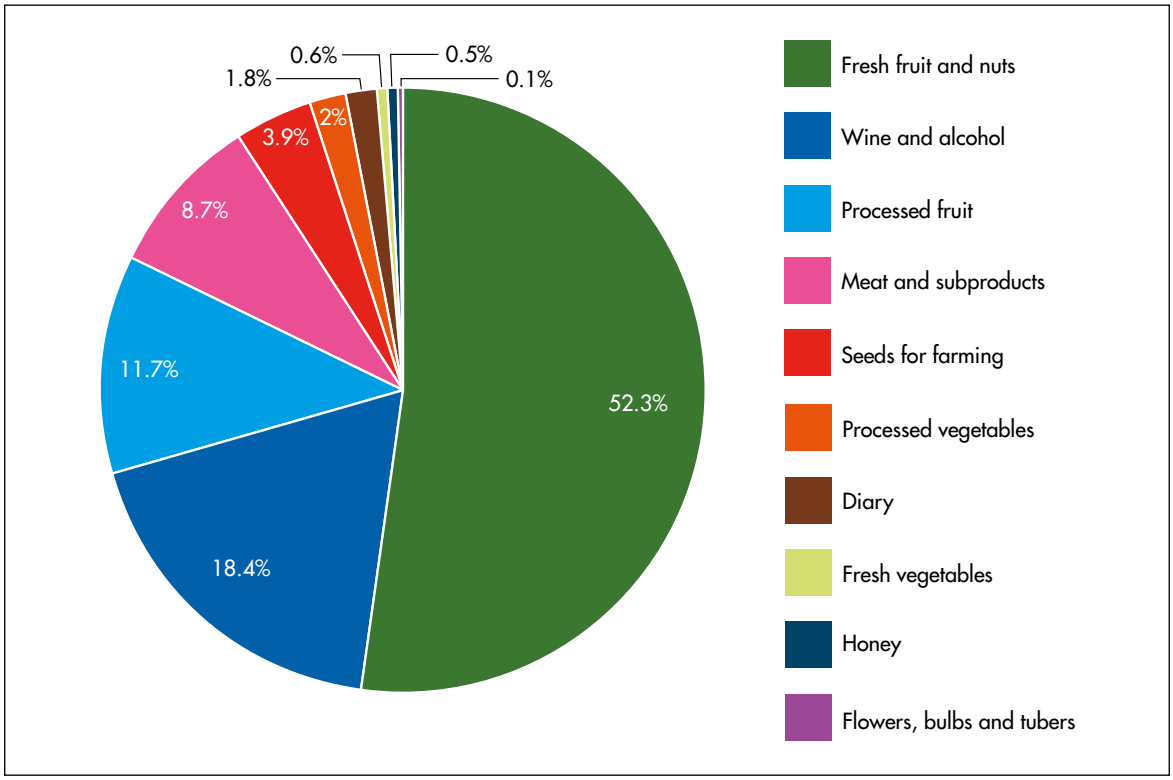
3 Chile's Agricultural Sector

This section describes the relevance of Chile's agricultural sector, and the main challenges faced by the sector. The relevance of the sector can be expressed in economic terms, in terms of its contribution to the national economy and its international positioning, in terms of the significant effects that agriculture has on the environment, and in social terms, including job creation and benefits for small producers. These aspects are presented in the following subsections, preceded by a characterization of the sector and its main products.

3.1 Characterization of the sector

Chile's agricultural sector is highly diversified, which is partially due to the fact that it is also considered to include wine production and food processing. Figure 8 presents the share of different products within the agricultural sector. Fresh fruit and nuts constitute over half of the exports, while wine and alcohol, processed fruit and meat, and meat subproducts together form a third of exports. It is important to bear in mind that, throughout the study, agriculture will include products such as those presented in Figure 8, even though some data in this section only regard primary agriculture (particularly the data used for the environmental and social analysis).

Figure 8: Share of different products in the agriculture export sector (2015)



Source: Own elaboration with information from ODEPA (2015a)

3.2 Economic importance

Agriculture, livestock, forestry and aquaculture represent around 3 per cent of Chile's GDP, as can be seen in column 4 of Table 4, and when including the processing of food, beverages and tobacco, this number rises to nearly 8 per cent in 2014 (Column 7 of Table 4).

Table 4: GDP (Million Chilean pesos) for selected activities in the agricultural sector, 2008–2014

Year	Agriculture & Livestock and Forestry	Fisheries & Aquaculture	% of total GDP for previous sectors	Processed food	Beverages & Tobacco	% of total GDP for all previous sectors
2008	2,711,891	405,094	3.3%	2,238,860	1,490,980	7.3%
2009	2,738,801	427,991	3.3%	2,720,168	1,599,232	7.8%
2010	3,029,808	509,379	3.2%	2,851,907	1,620,057	7.2%
2011	3,357,540	631,406	3.3%	3,109,379	1,867,223	7.4%
2012	3,330,408	459,713	2.9%	3,282,881	2,080,560	7.1%
2013	3,628,642	422,055	3.0%	3,660,109	2,212,296	7.2%
2014	4,009,841	475,260	3.0%	4,748,574	2,339,862	7.9%

Source: Central Bank of Chile (2015)

Chile's agricultural sector is of international importance. Table 5 presents Chile's fresh food exports as a percentage of the total, and its world ranking: 19th in 2013. Seen in this perspective, only wood products and basic manufacture reach a similar ranking (19th and 17th, respectively) (See Box 3 for more information). When looking at global exports of specific products, Chile falls in the top 5 for several of them, including table grapes and blueberries (1st), cherries (2nd), kiwifruit (4th), apples and avocados (5th). Further information is presented in Figure 9.

Table 5: Participation of Chile in global fresh food exports

Chilean fresh food		
Year	% share of world exports	Ranking
2013	1.44%	19
2012	1.29%	21
2011	1.28%	19
2010	1.31%	19
2009	1.4%	19

Source: Own elaboration with information from International Trade Center (2015b)

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Box 3: Ranking in global exports in 2013

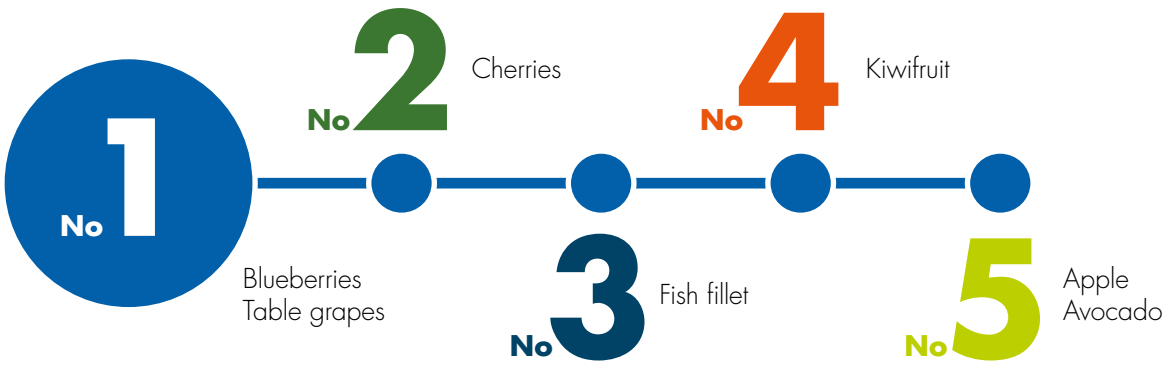
The table below illustrates the relevance of different Chilean economic sectors worldwide. Fresh food, wood products and basic manufactures, sectors that don't require much technology or processing, are the most relevant. On the other hand, export of textiles; electronic components and clothing from Chile have little relevance in world markets.

Rank of global exports for different Chilean sectors in 2013

Sector	Ranking
Fresh food	19
Processed food	31
Wood products	17
Textiles	67
Chemicals	48
Leather products	53
Basic manufactures	18
Non-electronic machinery	53
IT & consumer electronics	50
Electronic components	63
Transport equipment	52
Clothing	63
Miscellaneous manufacturing	62
Minerals	35

Source: Own elaboration with information from International Trade Center (2015b)

Figure 9: Chile as export leader for selected agriculture and aquaculture products



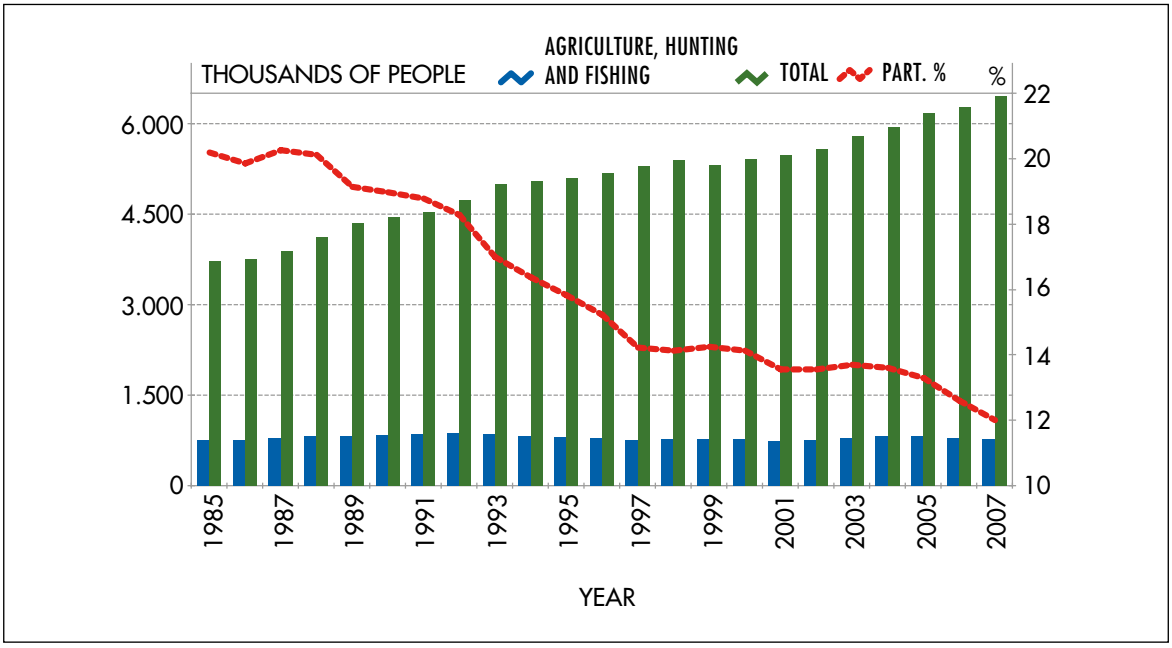
Source: Chilealimentos (2014)

3.3 Social aspects

Chile's agricultural sector serves as an important source of employment (particularly during the harvest period). The sector comprises a large amount of small and medium producers.

According to different official censuses[4], the sector employs an average of 795,000 people, but this number has shown a consistent decrease since 1985, as can be seen in Figure 10. In 1985, the sector still employed 20 per cent of the total workforce, and this number has decreased to only 8.4 per cent in 2012, as can be seen in Table 6. However, the sector is still the fifth most important in terms of employment.

Figure 10: Workforce employed in agriculture, hunting and fishing, and total participation, 1985–2007



Source: INE Chile (2009)

4 The last official census was carried out in 2007, and a new one is expected for 2017.

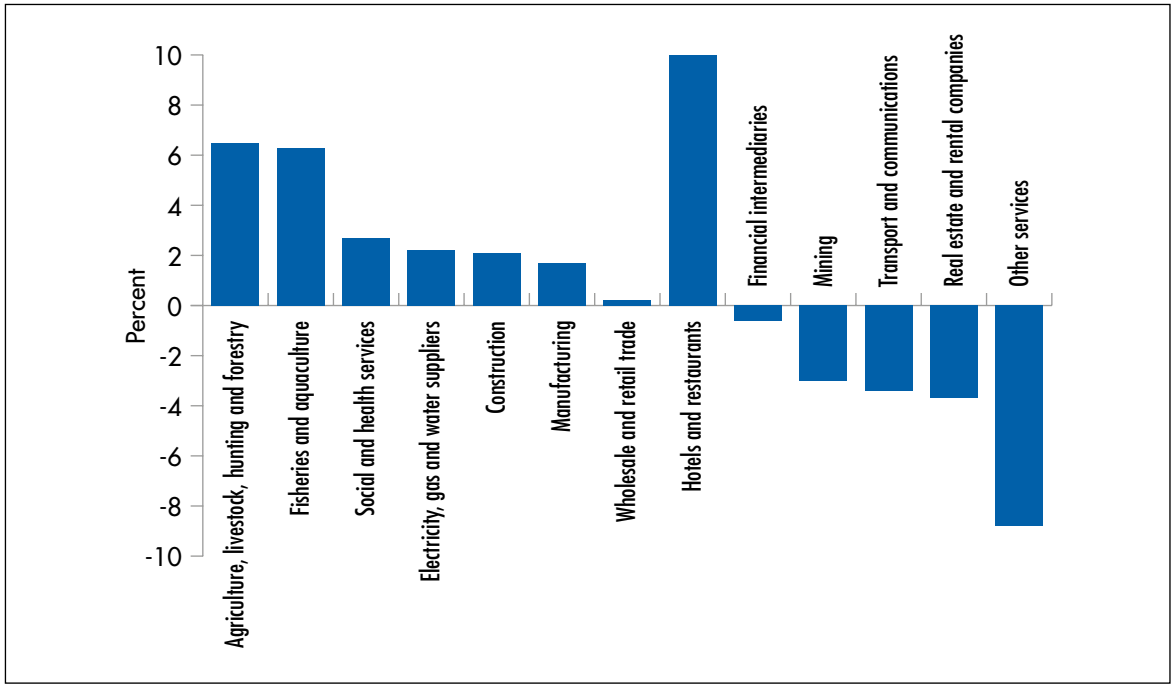
Table 6: Employment per sector

	2005	2012
Primary	**14.2%**	**10.4%**
Agriculture, livestock, hunting and forestry	**12.3%**	**8.4%**
Fisheries and aquaculture	0.0%	0.5%
Mining exploitation	1.0%	1.5%
Secondary (Industrial)	**28.0%**	**31.2%**
Non-metallic manufacturing industries	8.7%	9.1%
Metallic manufacturing industries	3.4%	4.4%
Water, gas and electricity supply	0.8%	0.8%
Construction	15.1%	16.9%
Tertiary (Services)	**57.8%**	**58.4%**
Wholesale and retail commerce	15.0%	17.5%
Hotels and restaurants	3.4%	3.5%
Transport, storage and communications	5.7%	6.0%
Financial intermediacy	3.0%	2.8%
Real estate	12.6%	13.5%
Defence and public administration	5.0%	4.3%
Teaching	5.3%	4.9%
Health and social services	2.8%	2.4%
Other services	5.0%	3.3%
Management of buildings and condominiums	0.1%	0.1%

Source: Own elaboration with information from Ministerio de Economía, Fomento y Turismo (2014a)

In terms of productivity per worker, as presented in Figure 11, the sectors of agriculture, livestock, hunting and forestry have shown an important increase, around 6.5 per cent, between 2005 and 2012, only surpassed by Hotels and Restaurants (10 per cent). Productivity in the fisheries and aquaculture sector also present an important growth rate, of 6.3 per cent in the same period.

Figure 11: Average growth in productivity between 2005 and 2012



Source: Ministerio de Economía, Fomento y Turismo (2014b)

Other social indicators with regards to the agricultural sector are land size per producer and the level of education of agricultural workers. Table 7 presents the different sizes and their share of the total amount of land available. The participation of small producers (less than 12 ha) **was** very significant, with 43 per cent having less than 5 ha. Figure 12 presents the level of education of producers between 1997 and 2007 for men and women. The Figure also reveals a higher participation of women in agriculture in 2007 compared to 1997, while the number of men working in the sector is diminishing.

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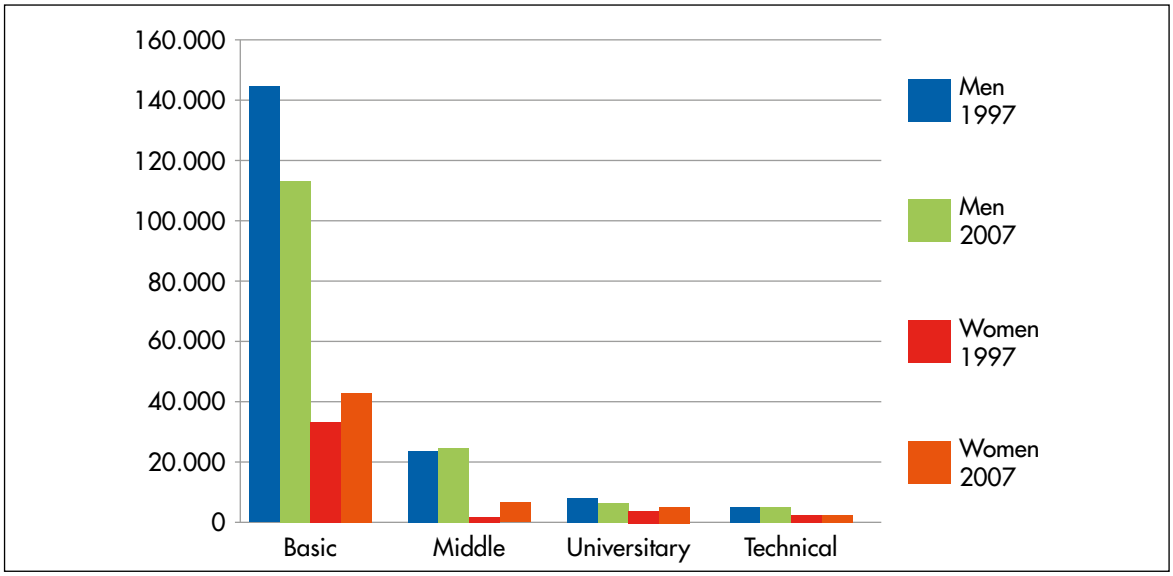
Table 7: Number of agriculture fields, according to size (hectares and %)

Size	1976	1997	2007
Less than 1ha	48,779	42,554	34,699
%	15.97%	13.08%	12.45%
From 1ha to less than 5ha	99,427	90,524	84,975
%	32.54%	27.82%	30.49%
From 5ha to less than 10ha	40,903	51,565	46,139
%	13.39%	15.85%	16.56%
From 10ha to less than 20ha	37,630	49,416	42,611
%	12.32%	15.19%	15.29%
From 20ha to less than 50ha	36,036	45,839	36,965
%	11.80%	14.09%	13.27%
From 50ha to less than 100ha	17,727	20,299	14,911
%	5.80%	6.24%	5.35%
From 100ha to less than 200ha	10,493	10,984	8,149
%	3.43%	3.38%	2.92%
From 200ha to less than 500ha	8,154	7,520	5,677
%	2.67%	2.31%	2.04%
From 500ha to less than 1000ha	3,236	2,891	2,056
%	1.06%	0.89%	0.74%
From 1000ha to less than 2000ha	1,447	1,536	1,048
%	0.47%	0.47%	0.38%
2000ha and more	1,686	2,245	1,430
%	0.55%	0.69%	0.51%
TOTAL	305,518	325,373	278,660

Source: INE Chile (2009)

Figure 12: Number of farms according to level of education and sex of the producer, between 1997 and 2007



Source: ODEPA (2009)

3.4 Environmental importance

Agriculture is a resource-intensive sector, using abundant water, soil, and energy resources. Energy use in farms and during packaging and distribution generates high amounts of greenhouse gas emissions. The use of agrochemicals can have a significant effect on eutrophication and toxicity, affecting soil and water quality. The following subsections will assess how agriculture in Chile impacts three areas: climate change, water and soil.

3.4.1 Climate change

According to the International Energy Agency (IEA), Chile emitted 77.77 Mt of CO_2 in 2012 (only considering emissions from fuel combustion), which corresponds to 0.25 per cent of the total amount of emissions worldwide. Emissions per capita amounted to 4.47 tCO_2 /capita for the same year, slightly below the world average of 4.51tCO_2 /capita, considerably lower than the average of OECD countries (9.68 tCO_2 /capita) but higher than the average non-OECD Americas (2.46 tCO_2 /capita) (IEA, 2014).

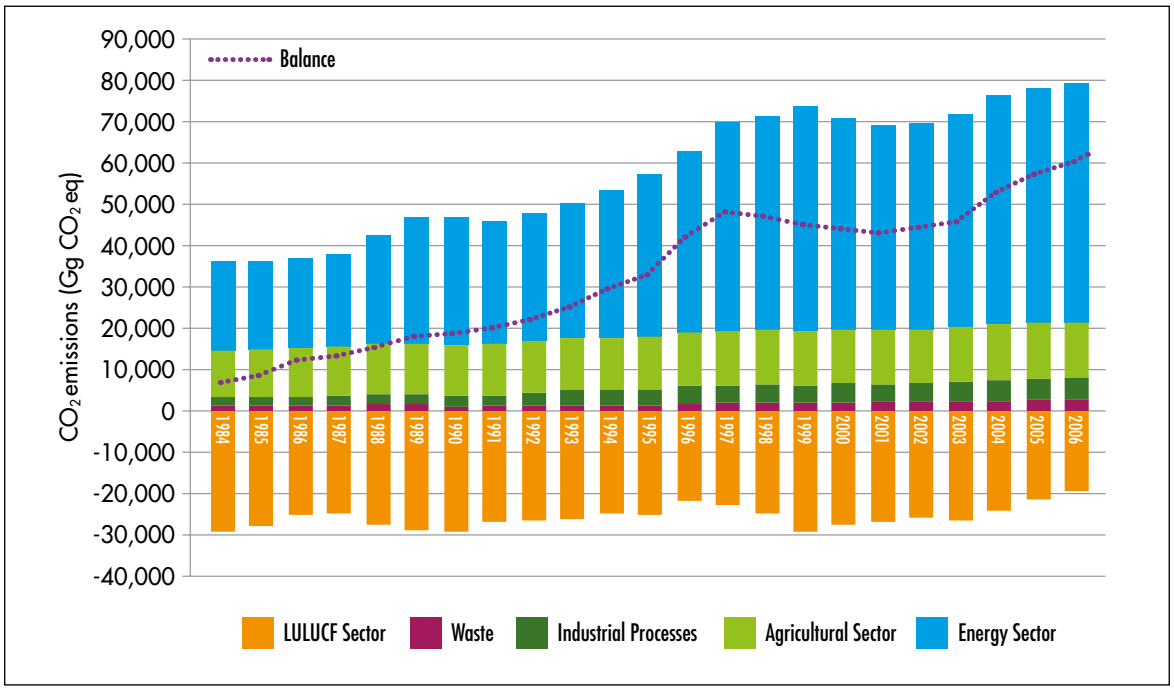
Table 8 and Figure 13 present the contributions of individual sectors to CO_2 emissions. The energy sector has the highest share, with almost 58 Gg of CO_2 q. Agriculture is the second largest emitter with 13,401Gg of CO_2 eq in 2006, 22 per cent of the country's total emissions, and 2 per cent more than in 2000. It is also worth noting that the contribution of land use, land use change and forestry (LULUCF) to the release of CO_2 into the atmosphere amounted to 29 per cent of Chile's total emissions.

Table 8: GHG sources and sinks in Chile for 2000 and 2006

Sector	Type	2000	2006	Variation
		Gg of CO_2eq	Gg of CO_2eq	%
Energy sector	Source	51,279	57,806	13%
Industrial processes	Source	4,447	5,361	21%
Agriculture	Source	13,103	13,401	2%
Land use, land use change and forestry	Sources and sinks	-27,446	-19,386	29%
Waste sector	Source	2,028	2,489	23%
National total		43,410	59,672	37%

Source: Ministerio del Medio Ambiente (2011)

Figure 13: Chilean GHG emissions by sector



Source: Ministerio del Medio Ambiente (2011)

The Ministry of Environment has made projections regarding the future emissions of agriculture, livestock and forestry, which are presented in Table 9. Emissions are expected to increase to 6,721 and 7,698 Gg CO_2 eq/year by 2030 and 2050 respectively. This will be the result of the rise in emissions from agriculture and livestock production (15 and 13 per cent between 2020 and 2050 respectively). Furthermore, more CO_2 will be released due to deforestation.

In order to reduce CO_2 emissions in the agriculture, livestock and forestry sector, energy efficiency needs to be improved, nitrogen fertilizers need to be better used, forest fires need to be reduced and the forestry sector's capacity to capture CO_2 through native forest management and lower soil degradation need to be improved (Ministerio del Medio Ambiente, 2011).

Table 9: Projected GHG emissions for selected subsectors of the agriculture, livestock and forestry sector

Subsector	2020	2030	2050
	(Gg CO_2eq/year)		
Forestry	-150.0	-149.4	-96.1
Annual and perennial crops	1,371.1	1,428.5	1,572.2
Livestock	5,534.4	5,800.3	6,266.6
TOTAL	6,755.5	7,079.4	7,742.7

Source: Own elaboration with information from Ministerio del Medio Ambiente (2011)

Inevitably, the agricultural sector will be seriously affected by climate change. Fruit plantations will need to move south from their current location because of desertification. Additionally, higher temperatures will increase the presence of plagues, and the spread of fungal or bacterial diseases. The drought that is currently affecting the north and central regions of the country has also been related to climate change (see section 3.4.2). Some positive results have also been observed, like better fruit quality due to lower acidity of the soil, and the expansion of subtropical species, like oranges, in regions where these did not use to grow.

3.4.2 Water

Chile is privileged in terms of water supply, with its abundance of lakes and rivers. The volume of rainwater moving through rivers and groundwater is 53,000 m3/person/year, eight times the average of the rest of the world and 25 times the minimum estimated to enable sustainable development (World Bank, 2011). However, water available is not evenly distributed in the country. The average water available north of Santiago is less than 800 m3/person/year, while south of Santiago the average is above 10,000m3/person/year, as presented in Table 10. In fact, in 2010, in all regions north of the country's capital, water demand was higher than water supply, as can be seen in Figure 14. For example, region II (Antofagasta) and III (Atacama)[5] had practically no supply.

Nevertheless, important economic activities take place in these regions, and water demand is higher than 10 m3/s. The mining sector is highly concentrated in the northern regions (Antofagasta and Atacama), while an important share of agriculture activities are in the central regions, such as Coquimbo (IV), Valparaíso (V region), the Metropolitan region (RM) and O'Higgins (VI).

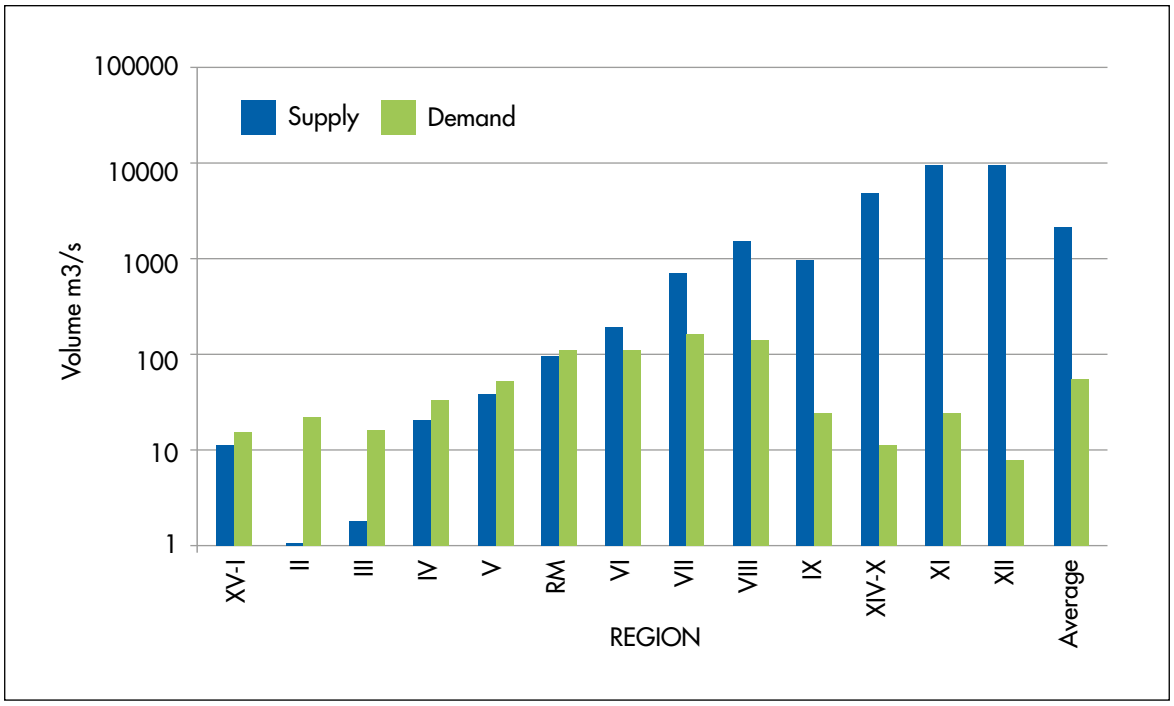
Table 10: Available water per inhabitant in Chile

Region	m^3/person/year
I and XV	854
II	52
III	208
IV	1,020
V	801
RM	525
VI	6,829
VII	23,978
VIII	21,556
IX	49,273
X and XIV	136,207
XI	2,993,535
XII	1,959,036
Average	**53,953**

Source: Own elaboration with information from World Bank (2011)

5 The Roman numerals correspond to the numbering of regions that is most commonly used in Chile. It generally runs from north to south, with a few exceptions.

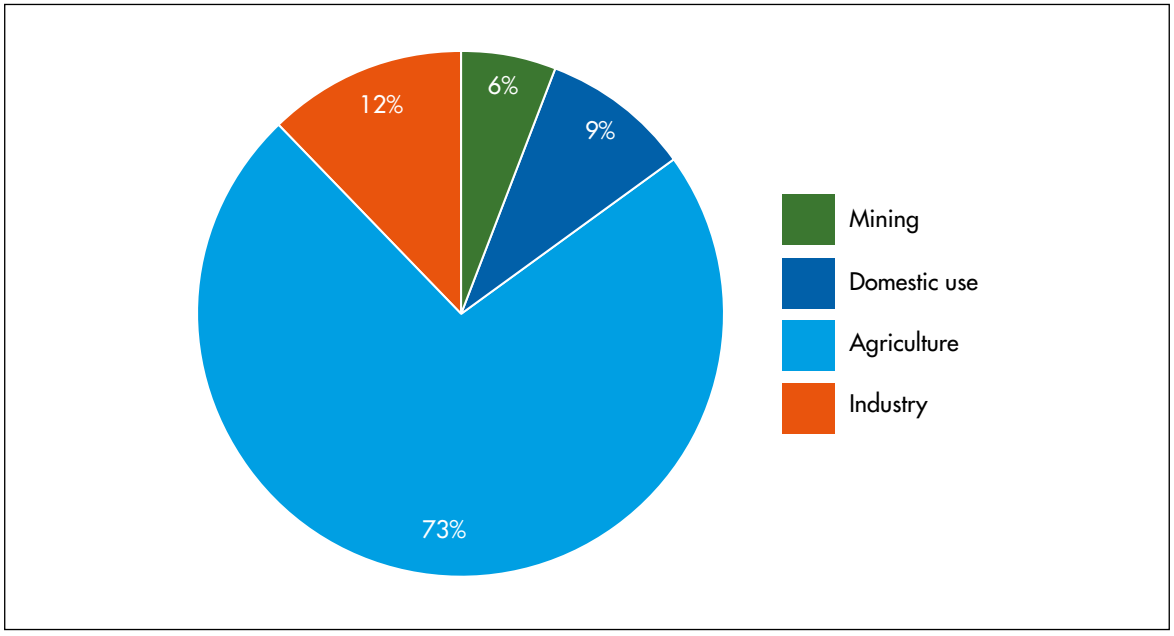
Figure 14: Available resources and extraction of water for different regions in Chile



Source: World Bank (2011)

Across the country, agriculture is the sector with the highest water demand, using 73 per cent of this resource, followed by the industrial sector (12 per cent), mining (9 per cent) and domestic use (6 per cent), as can be seen in Figure 15.

Figure 15: Water use per sector



Source: Ministerio de Agricultura (2013), with information from World Bank (2011)

The Ministry of Agriculture (Ministerio de Agricultura, 2013) has identified three main factors that explain the water scarcity.

1. **Lack of proper infrastructure to accumulate water.** Precipitations occur in the winter months, while agriculture is mostly in need of water during the summer. Therefore, an adequate infrastructure to accumulate water is essential. Moreover, it is necessary to improve the water conduction and irrigation systems. At the moment, only 18 per cent of all canals owned by the state are covered, and only 30 per cent of land has drip/trickle irrigation or similar.

2. **Overexploitation of water** occurs when people or companies use more water than is available, either because of overgranting of rights or because of illegal extraction.

3. **Climate change.** In the medium and long term, experts estimate that climate change will further increase the drought problems the country has been facing over the past years. Climate change is affecting both the accumulation of snow in the mountains and the available water in dams and groundwater.

On top of the water availability problems, water quality is also an issue. Residential and industrial residues cause water contamination. The agricultural sector is responsible for water contamination by crop residues or by the excessive use of fertilizers and pesticides, but this pollution, in turn, negatively impacts the sector. Therefore, the adoption of a more sustainable form of water management is essential.

3.4.3 Soil and biodiversity

Chile's agricultural sector only uses 4.5 per cent of the national territory, as can be seen in Table 11. Yet, it has contributed to diverse problems, such as soil erosion, salinization, pollution and loss of fertility, as summarized in Table 12. The causes include bad irrigation practices, the use of saline water, and excessive use of fertilizers and pesticides; and these causes also affect biodiversity. An adequate set of good practices is essential to avoid further degradation and to repair degraded soils.

The effects of degraded soils and biodiversity loss can be even more harmful to small farmers. According to The Economics of Ecosystems and Biodiversity (TEEB), the rural poor are the most likely to suffer the consequences of the loss of biodiversity, since they often rely directly on local ecosystem and biodiversity for income, quality of life, and health (TEEB, 2011).[6]

Table 11: Land use, in hectares and percentage, in 2013

CURRENT LAND USE	Surface (ha)	% National
TOTAL	75,665,320	100.0
Urban and industrial areas	259,864	0.3
Agriculture	3,398,685	4.5
Meadow and scrubs	21,302,551	28.2
Forest	16,545,223	21.9
Wetlands	3,583,831	4.7
Areas without vegetation	25,033,471	33.1
Snowfields and glaciers	3,917,358	5.2
Others	1,624,339	2.1

Source: Corporación Nacional Forestal, 2013

6 This has led to the emergence of the concept of GDP of the poor, an adapted measure of GDP developed by TEBB that shows the dependence of poor people on natural resources, from an economic, environmental and social perspective, which will ultimately reflect the impact of loss in biodiversity to the well-being of the poor (TEEB, 2011)

Table 12: Major problems regarding land use in Chile

Anthropogenic causes	Problem	Effects
Lack of vegetation	Erosion	Physical, chemical and biological degradation of soils
Inadequate tillage		Reduction of productivity
Bad irrigation practices		Reduction of absorption and infiltration capacity
Building of roads		Loss of biodiversity
		Desertification
Cultivation of saline soils	Salinization	Phytotoxicity
Irrigation with saline water		Lower variety of crops
Inadequate irrigation technologies		Difficulties to develop profitable crops
		Physical and biological degradation of soils
		Pollution of underground water
		Lower availability of nutrients
Industrial activity	Pollution	Decreasing of agriculture and livestock production
Mining activity		Loss of biological potential of the soil
Excessive fertilization		Alteration of physical and chemical characteristics of the soil
Agrochemicals		Growth of diseases among the population
Acid rain		Increase of health costs for population
Urban advance	Irreversible land change	Decreasing of agriculture and livestock land
Rural residential properties		Alteration of drainage system
Military use of land		Increase of greenhouse gas effect
Land partitioning		Loss of biodiversity
Extraction of sand and gravel	Soil extraction	Decreasing of agriculture and livestock land
Extraction of clay		Alteration of drainage system
Extraction of organic matter		Loss of biodiversity
Extractive agriculture	Loss of fertility	Loss of biological activity
Fire		Increase of environmental pollution due to the usage of agrochemicals
		Deterioration of meadows
		Lower production and productivity of soils

Source: Own elaboration with information from INE Chile (2012)

3.5 Challenges of the sector

The important focus on exports in Chile's agricultural sector has allowed it to incorporate better technologies, to adopt higher quality and safety standards, and to expand as a reliable international supplier. However, there are still several challenges for the industry to remain competitive, which are exemplified in Figure 16 below. Overall, these challenges are linked to the different products.

Figure 16: Challenges for agriculture

Fresh and Processed fruit	• To maintain high sanitary standards, since this provides prestige and trust in internationl markets; • To quickly adapt to new laws, standards and tendencies in developed countries, particularly the European Union and the USA; • To maintain the good reputation of Chilean producers and exporters as realiable producers of high-quality and safe products; • To develop strategies to penetrate and expand into new markets
Fisheries	• To maintain high quality standards; • To develop and expand into new markets, such as Brazil or Russia; • To reduce environmental impacts, such as the carbon footprint of the product.
White meat	• To improve vigilance and control, as sanitary and safety risks generate important uncertainty; • To improve energy efficiency, as energy is the sector that most limits the sector's productivity; • To comply to new standards and laws related to environmental issues and animal well-being; • To diversify destination markets
Wine	• To increase the level of exports; • To expand into new markets with high-quality wines; • To satisfy the growing demand for sustainably produced wines; • To use advanced tools to measure the environmental performance.

Source: Own elaboration, with information from Qualitas Consultores (2011) and Banfi (2010)

Many of these challenges are linked to the tendency of consumers to increasingly demand better and more sophisticated products, particularly with regards to sustainability. This is reflected in the different sustainability campaigns that major retailers in the USA and the EU started, at first only in their own stores, but then expanding to include their worldwide suppliers. While this is represents a chance to render supply chains more sustainable, this development also constitutes a significant challenge for producers and exporters.

However, there have been no specific limitations for the import of Chilean products into markets such as the EU yet, but this could occur in the future if the requirements in such markets change and would come to include, for example, requirements to reduce or pay for greenhouse gas emissions. Additionally, in the EU large companies have to disclose financial and non-financial reporting, including with regard to environmental matters (European Commission, 2015)..

Sustainability standards and eco-labels have been created to promote sustainable production, with positive impacts on people and the environment. They are one of the few proven vehicles for making production and trade more sustainable, while also delivering positive economic, social and environmental benefits to producers, farmers, workers, their local environments, and to ecosystems (ISEAL Alliance, n.d.). With the adequate transparency and rigour, sustainability standards and eco-labels have the potential to aid Chilean exporters to address several of the challenges mentioned in Figure 16.

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4 Sustainability Standards and Eco-labels in Chile's Agricultural Sector

As seen in the previous section, one of the main challenges of the agricultural sector is related to the increased competition in international markets, as these pay increasing attention to sustainability issues. This has led to the emergence of a wide array of initiatives like sustainability standards and eco-labels. This section discusses the international sustainability standards that are relevant for Chile, and the progress made in the country so far. Finally, this section contains an analysis of how sustainability standards and eco-labels can generate trade opportunities for Chile's agricultural sector.

4.1 General background

Today's sustainability standards and eco-labels emerged in the 1970s, but can be traced back to the beginning of the organic movement in the 1940s. Initially associated to organic agriculture, different related topics were added over time, such as food safety and quality, and fair trade. Different products and services were also included. Table 13 provides an overview of some of the relevant initiatives.

According to Ecolabel Index, there are currently over 460 standards and eco-labels worldwide[7], many of which cover agricultural products. The Standards Map, an online platform that belongs to the International Trade Centre, contains information about 176 sustainability standards and eco-labels around the world for different products and services, including livestock and agricultural products, construction products, electronics,

7 This corresponds to what the Ecolabel Index is currently mapping. These initiatives are present in 197 countries and for 25 sectors. For further information, please see www.ecolabelindex.com

energy products, forestry, mining, and jewelry, among others. Out of the 176, there are 100 that include agricultural products. For the analyses in this study, this tool will be used. While it is not the only tool available, it was selected because of its intuitive and easy-to-use interface and comprehensive information coverage.

Table 13: Background of different sustainability initiatives

Initiative	Year of creation	Purpose
International Federation of Organic Agriculture Movement	1972	Coordinate actions of organic agriculture movements and to enable scientific and experimental data
Soil Association Organic Standard	1973	Provide food of high quality and made with integrity, following organic principles of ecology, fairness, care and health
Blue Angel	1978	Ensure that products and services are safe for people, environment, water and natural resources
Rainforest Alliance	1986	Shepherd extractive and land-intensive industries towards a sustainable model
British Retail Consortium (BRC)	1992	Create a vibrant and sustainable retail industry for the future
Marine Stewardship Council	1997	Address the problem of unsustainable fishing, safeguarding seafood supplies for the future
Best Aquaculture Practices	1997	Promote responsible practices across the aquaculture industry
Global G.A.P. (former known as EuropGAP)	1997	Reduce impact of agriculture operations and minimize the use of chemical substances
Fairtrade Label Organization	1997 (although the first Fairtrade Label Organization label was launched in 1988)	To unite different fairtrade organizations and harmonize standards and certifications worldwide
International Food Standards	2003	Harmonize food, product and service standards
World Fairtrade Organization	2009 (although it had precursors in the 1980s)	Strive towards a sustainable and fair global economy

Source: Own elaboration with information from the websites of the respective organizations

4.2 Sustainability standards in Chile

4.2.1 International initiatives for Chilean exporters

Chilean producers and exporters can choose to comply with a vast amount of global sustainability standards. According to Standards Map, Chilean exporters can choose from 58 standards. From these, as shown in Table 14, 37 apply to agricultural products, of which 34 to fresh fruit and vegetables. Wine and food products have fewer standards, and these are also more similar to each other, mostly because, according to Standards Map definition, these standards mostly apply to the processing stage and do not include the agricultural phase.

The figures below illustrate the amount of sustainability standards and eco-labels that are being applied in Chile.

Table 14: Sustainability Standards and similar initiatives by different products for Chilean exporters

Product categories	Amount of initiatives
All products	58
Agriculture*	37
Fresh fruit and vegetables	34
Wine	25
Food products	28

* "Agriculture", under the Standards Map definition, includes the forestry sector

Source: Own elaboration with information from International Trade Center, 2015a

Table 15 presents the complete list of initiatives relevant for Chile's agricultural sector. Several of these exist at the international level and have existed for several years, such as Global G.A.P., the Rainforest Alliance, and Fairtrade International. Other initiatives are specific to some regions (Fair Trade USA) or companies (Unilever Sustainable Agriculture Code). The focus of the different initiatives is also different: some are more oriented towards social issues, such as Fair for Life or the Ethical Trading Initiative; others focus on quality and safety, like BRC Global Standards and Safe Quality Food (SQF); and some focus on organic production, such as the USDA National Organic Program and EU Organic Farming. The heterogeneity of the different initiatives is something to have in mind, since Chilean agriculture exporters need to adapt to those that are or could be mandatory in their markets, or that could allow them the best opportunity to distinguish themselves from competitors.

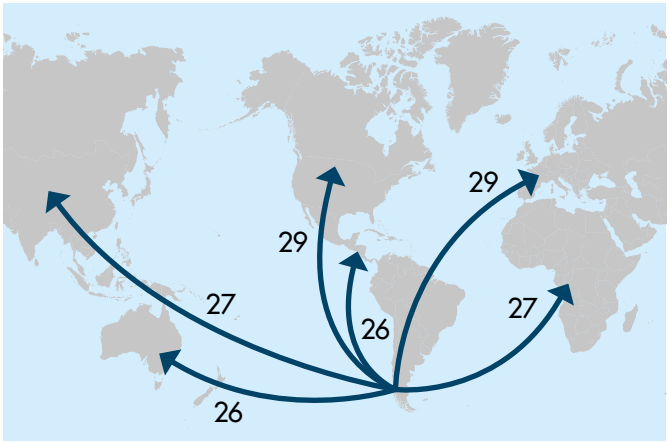
Table 15: Sustainability initiatives relevant to agricultural exports from Chile

Initiatives for Agricultural Products	
• ASCC PLUS • Bio Suisse • British Retail Consortium (BRC) Global Standards — Food • Business Social Compliance Initiative Code of Conduct (BSCI) • Climate, Community & Biodiversity (CCB) Standards • EcoVadis • Ethical Trading Initiative (ETI) • EU Organic Farming • Fair for Life • Fair Trade USA • Fairtrade International – Small Producers Organizations • Fairtrade International – Hired Labour • Forest Stewardship Council (FSC) – Forest Management • Forest Stewardship Council (FSC) – Chain of Custody Certification • Global Reporting Initiative (GRI) • Global G.A.P. – Crops • Global G.A.P. – Floriculture • Good Manufacturing Practices (GMP) & Feed Certification scheme	• Global G.A.P. – Floriculture • Guide on Social Responsibility for Chinese International Contractors • International Food Standard (IFS) • ILO Labour Standards • International Sustainability and Carbon Certification (ISCC) • LEAF Marque • LIFE Certification • MPS-AB • OECD Guidelines of Multinational Enterprises • Safe Quality Food (SQF) Program • SAI Platform – Farm Sustainability Assessment • Sedex Global (Supplier Ethical Data Exchange) • Safe Quality Food (SQF) Program • Sedex Members Ethical Trade Audit (SMETA) • Sustainability Assessment of Food and Agriculture Systems (SAFA) • Sustainable Agriculture Network – Rainforest Alliance • UN Global Compact • Unilever Sustainable Agriculture Code • USDA National Organic Program • Verified Carbon Standard (VCS) • WFTO Guarantee System

Source: Own elaboration with information from International Trade Center, 2015a

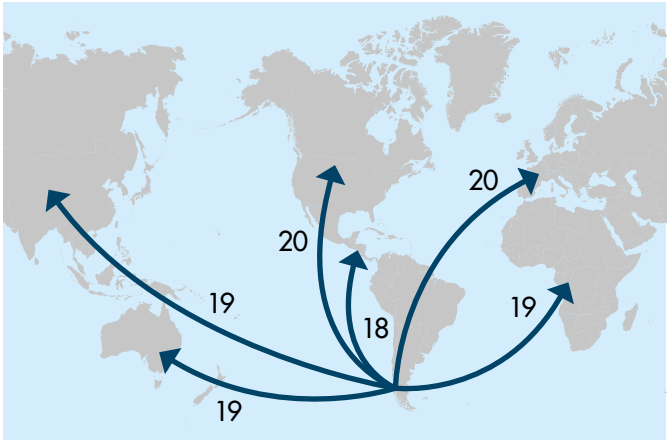
Additionally, most sustainability standards or eco-labels have a regional or country focus, making it almost impossible for exporters not to comply with them. Figure 17 and Figure 18 show examples of the amount of initiatives for fresh fruit and vegetables, and for wine, depending on the destination region (North America, Central America, Europe, Africa, Asia, and Oceania). In both cases, Europe and North America have the highest amount of initiatives, although only slightly higher than other regions.

Figure 17: Number of initiatives for Chilean fresh fruit and vegetables depending on the destination market



Source: Own elaboration with information from International Trade Centre (2015a)

Figure 18: Initiatives for Chilean wine depending on the destination market



Source: Own elaboration with information from International Trade Centre (2015a)

As a response to this situation, different initiatives have arisen in Chile which attempt to homologate with different international initiatives. These Chilean initiatives will be presented next.

4.2.2 National initiatives of international importance

In most developing countries, social and environmental performance lags behind the requirements of major importing markets and their customers. In these markets, more consumers demand and have the purchasing power to buy products that have been produced in accordance with environmental and social criteria. These criteria need to be translated into local regulations and legislation, in order to ensure that they are upheld not only in the production of export products, but also for those destined to domestic markets. This way, international standards can be used as a means to reflect local calls – by policy-makers and consumers – for better social and environmental performance.

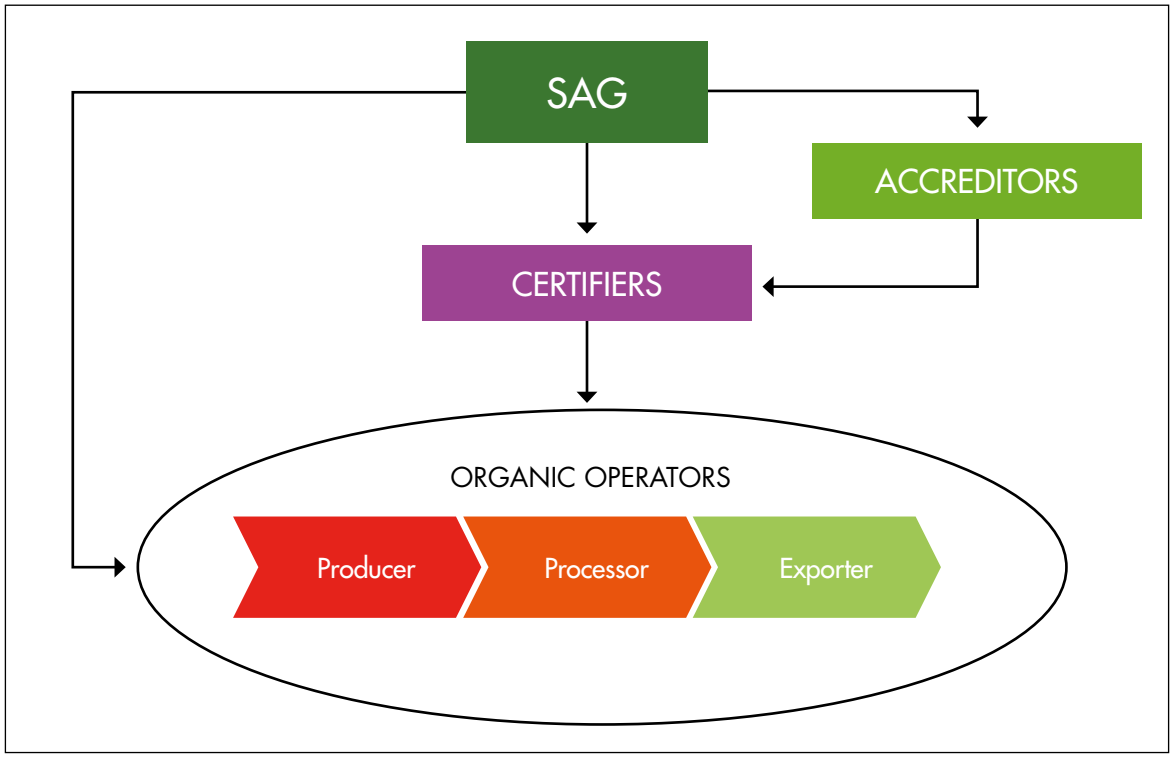
While this study as a whole focuses on international standards, this section will look at the national initiatives that are bridging the gap between local and international standards. The main sustainability programmes related to Chilean agriculture are Organic Certification, the Good Agriculture Practices on Sustainability (Chile G.A.P.) and the Sustainability Code of the Wine Industry (ProChile and Fundación Chile, 2012). Additionally, other important initiatives include the Clean Production Agreements (APL, according to its initials in Spanish) and the emerging Protocol developed by the Office for Agricultural Studies and Policies (ODEPA, according to its Spanish initials). These five initiatives will be described next.

4.2.2.1 Organic Certification

In 2006, as part of Law 20,089, the National System of Organic Product Certification was created, which established conditions for the commercialization of organic and similar products, and created a registration system for "organic", "biological" or "ecological" products (SAG, n.d.). The goal of the law is to develop organic production in Chile under clearly defined parameters, in order to obtain certification of products for the national market as well as for different destination markets (SAG, 2011).

The Agriculture and Livestock Service (SAG, according to its Spanish initials) is a public organism, dependent of the Ministry of Agriculture. Its mission is to promote the development of agriculture, forestry and livestock through the protection and improvement of animal and plant health, and it is in charge of ensuring compliance with the abovementioned law. The system of accreditation and certification works as presented in Figure 19.

Figure 19: Chile's accreditation and certification system for organic certification



Source: Own elaboration with information from SAG (2013)

In spite of these institutional changes and the improved control of organic production, the organic exports of fresh fruit is still a small segment of total fruit exports, as can be seen in Table 16. In fact, there even has been a downward trend in the past few years for some of the main products, such as blueberries. There might be some productive factors that are generating barriers for organic exports, or maybe the costs of organic production are prohibitive for most Chilean producers.

Table 16: Conventional and organic exports for selected fresh fruit

		Thousand kg and %			
Species	Type of product	2012	2013	2014	2015*
Avocados	Conventional	85,985	90,398	106,197	54,682
	Organic	1,113	413	259	81
	% organic	1.3%	0.5%	0.2%	0.1%
Table grapes	Conventional	801,645	861,084	727,841	726,990
	Organic	598	440	669	253
	% organic	0.07%	0.05%	0.09%	0.03%
Apples	Conventional	760,916	831,643	808,521	592,441
	Organic	23,002	26,193	23,891	18,767
	% organic	3%	3%	3%	3%
Cherries	Conventional	57,807	59,978	90,536	27,209
	Organic	847	96	31	16
	% organic	1.5%	0.2%	0.0%	0.1%
Plums	Conventional	104,523	116,452	48,303	94,981
	Organic	458	708	26	139
	% organic	0.4%	0.6%	0.1%	0.1%
Blueberries	Conventional	69,949	83,811	82,654	55,268
	Organic	6,991	6,267	4,582	3,546
	% organic	10.0%	7.5%	5.5%	6.4%
Kiwifruit	Conventional	221,465	218,200	102,922	178,214
	Organic	6,897	4,780	4,056	4,100
	% organic	3.1%	2.2%	3.9%	2.3%

* 2015 data covers until October

Source: Own elaboration with information from ODEPA's statistical database and Expordata (2015)

4.2.2.2 Chile Good Agricultural Practices (G.A.P).

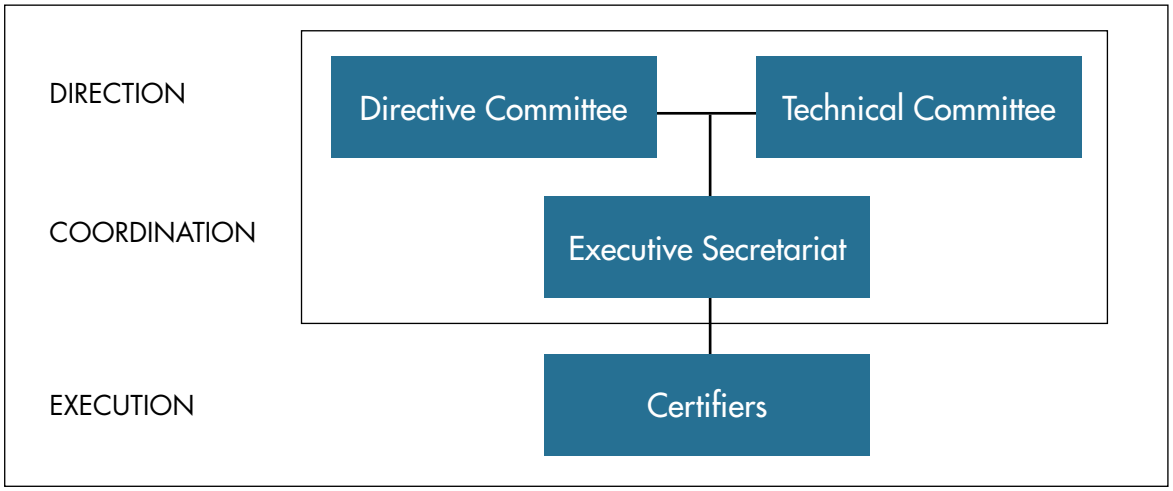
Chile G.A.P. was developed by the Chilean fruit industry in order to adapt to international requirements (mostly related to good practices and food safety) and to facilitate the process of compliance to international Good Agriculture Practices. In fact, it is currently recognized by Global G.A.P., National Sanitation Foundation (NSF) and ChinaGAP (ChileGAP, n.d.). At first, it only included agricultural practices, but sustainability requirements were also developed at a later stage. However, these are not being certified at the moment.

Chile G.A.P. was developed by the Foundation for the Development of the Fruit Industry (FDF) and supported by the Chilean Fresh Fruit Association (Chile Fruit), the Association of Chilean Fruit Exporters (ASOEX), the Chilean Promotion Bureau (ProChile) and the Ministry of Agriculture. Figure 20 presents the structure of Chile G.A.P.

Different institutions in the industry provided inputs and recommendations for the establishment of Chile G.A.P. As the most important destination markets for Chilean agricultural products are in Europe and North America, markets that require some type of certification (specifically EUREPGAP and Food Safety), Chile G.A.P. is benchmarked against the main European and North American requirements (Hinojosa, 2006; Fundación

para el Desarrollo Frutícola, 2013). While EUREPGAP's main concern is the use of pesticides and agricultural practices, Food Safety is mostly preoccupied with hygiene and safety. For this reason, Chile G.A.P. focuses on four pillars: society, environment, food safety and economic sustainability.

Figure 20: Chile G.A.P. structure



Source: Own elaboration with information from Hinojosa (2006)

Although Chile G.A.P. certification is widespread in the industry, the amount of certified fruit producers is not very high, as can be seen in Table 17 for a sample of products.

Table 17: Sample of Chilean fruit producers with Chile G.A.P. certification

Product	Quantity
Apples	2
Avocados	1
Blueberries	3
Cherries	1
Clementine	1
Table Grapes	7
Kiwi	2
Lemons	1

Product	Quantity
Nectarines	2
Olives	1
Oranges	1
Peaches	2
Pears	2
Plums	2
Pomegranates	1
Tomatoes	3

Source: Own elaboration with information from the GlobalG.AP database (https://database.globalgap.org/globalgap/index|SF.faces)

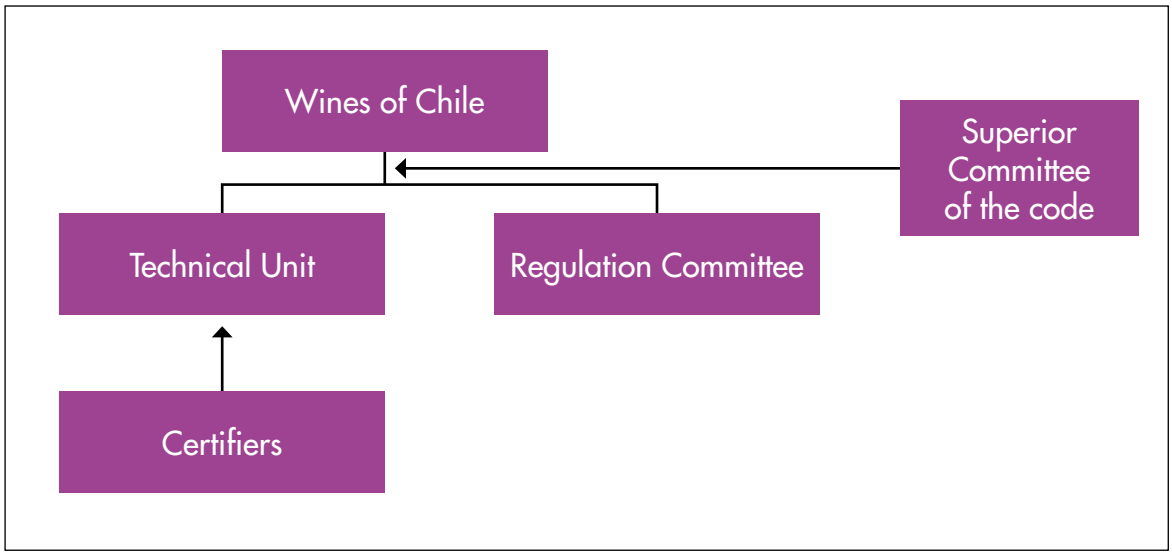
4.2.2.3 Wine Industry Sustainability Code

The Sustainability Code of the Wine Industry is a voluntary standard managed and governed by Vinos de Chile (Wines of Chile). The structure of the Code includes the following organs (see Figure 21):

- The Superior Committee, responsible for the transparency and consistency of the Code;
- The Regulation Committee, which reviews and suggests regulatory changes of the requirements and the criteria for certification;
- The technical unit, which administers the Code and communicates with the vineyards, certification organisms and accreditors;
- The Certifiers, who are in charge of the process of certification itself.

Both committees are represented by different stakeholders such as vineyards, academia, retail and glass suppliers.

Figure 21: Institution of the Sustainability Code of the Wine Industry



Source: Wines of Chile website: www.sustentavid.org/sistema/21/

70 per cent of the wine exported by Chile (47 vineyards) is part of the initiative (Diario Financiero, 2014). The certification works in three complementary areas. These are:

- Vineyards;
- Cellars and bottling facilities;
- Social responsibility in the vineyards and different facilities.

The standard has different criteria for different areas, and in the beginning, producers only need to comply with a certain percentage of them. This percentage increases over time (every two years, a new set of goals is adopted for each company) as a way to value continuous improvement. The criteria, goals and scoring are defined by a large group of stakeholders from the industry and from academia, among others. Wines of Chile has received international recognition and collaborates with different initiatives.

4.2.2.4 Clean Production Agreements (CPAs)

CPAs are voluntary agreements between private and public actors, supervised by the National Clean Production Council (CPL, according to its Spanish initials). One of the members of this Council is the Chilean Production Development Corporation (CORFO, according to its Spanish initials), an institution that belongs to the Ministry of Economics, Development and Tourism. Through this public–private coalition within the CPAs, the CPL also works closely together with public sector actors such as the Ministry of Environment, the Ministry of Energy, SAG and the Superintendence of Environment, as well as with trade associations from different industries, representing the private sector.

The CPAs aim to clean production through specific goals and actions. The purpose of cleaner production is to improve efficiency and productivity, whilst reducing and minimizing the social and environmental impacts (Consejo Nacional de Producción Limpia, n.d.).

The main guidelines of the CPAs are:

- To select low-impact raw materials;
- To promote the efficiency of the productive process;
- To implement and develop more efficient techniques;
- To prevent pollution;

- To ensure the innocuousness of products;
- To reutilize, recuperate and recycle supplies and residues;
- To improve safety and health conditions and training of the workforce.

Besides these guidelines, the definition of specific goals and requirements is a joint task of the industry and the different public actors involved, with the help of an initial diagnosis of the performance of the companies. This industry-driven and customized approach has contributed to the success of CPAs, since it allowed industries or groups of producers to address self-identified priority topics, which might differ between industries or groups of producers.

There are currently 98 signed CPAs, which involve 5,800 companies and 8,435 production plants, mainly in agriculture (68 per cent). By February 2015, the environmental impacts included a reduction of 4,065,000 tons of CO_2 eq., savings of 20,200 m_3 of water, a reduction of 9.5 million Kwh in electricity consumption, and the correct treatment of 25,390 tons of solid industrial waste. In terms of economic results, operational costs and investment had reached 27,885.7 million Chilean pesos (around 45 million US dollars), while the savings resulting from the lower resource basis were approximately 25,177.3 million Chilean pesos (around 40 million US dollars)[8] (Díaz, 2015).

4.2.2.5 Office of Agriculture Policies and Studies (ODEPA)

ODEPA is public service dependent on the Ministry of Agriculture, and its mission is to provide regional, national and international information on prices, production, regulations, among others, to actors in the agricultural sector, in order to facilitate their decision-making process.[9] ODEPA is coordinating the "Working Group on the Sustainability of the Public–Private Food Exporters Council", which had its first meeting in November 2014. The objective of this working group, whose members include different public and private associations, is to coordinate actions between the public and private sector in order to optimize the sustainability performance of the agriculture export sector. At the occasion of the first meeting, participants agreed that the sector needed to elaborate standardized information about sustainable production practices, whilst also improving the coordination of the different public institutions, and incorporating lessons learned from the different production sectors (Acuña, 2014).

Additionally, ODEPA is developing a Sustainable Agriculture Protocol. This Protocol is expected to improve the efficiency of such policies, by:

- Implementing combined public–private regulations;
- Generating incentives for producers;
- Introducing improved systems of education and information.

The Protocol will build on existing initiatives and include market requirements, incorporate best practices and provide producers with useful information, in order to render production more sustainable. The Protocol is also oriented to small producers, attempting to encourage them to become involved in sustainability issues, whilst having their limitations in mind. The Protocol aims to identify synergies with other institutions and instruments that could help address small producers' specific limitations.

Additionally, ODEPA is currently joining CORFO, CPL and the Agriculture and Livestock Development Institute (INDAP, according to its Spanish initials) to create "Sustainable Production Agreements". These new agreements will further the work of the CPAs and use the principles and requirements of the Protocol to help producers improve their sustainable performance. They will cooperate with the Ministry of Agriculture to develop a logo or label that can make these producers recognizable to consumers.

8 Although the overall costs and savings are quite close to each other, they do not necessarily correspond to the same companies.
9 For additional information, please visit: http://www.odepa.cl/que-es/

4.3 Benefits of sustainability standards and eco-labels and opportunities for exporters of agricultural products

The market value of certified agricultural products in 2008 was around US$ 40 billion per annum and it is estimated to increase to US$ 210 billion by 2020 and US$ 900 billion by 2050 (TEEB, 2010).

The following section will cover the multiple opportunities that sustainability standards present in the context of a green economy, including the economic, environmental and social aspects. These opportunities can be captured as added benefits in comparison to conventional production, or as avoided costs that result from the implementation of sustainability standards. The next section covers the costs and necessary investments arising from sustainability standards. These multiple opportunities and costs have impacts at different levels, including for the companies that adhere to standards, for the public sector, and for society as a whole. These impacts can be direct or indirect.

Due to a lack of Chile-specific studies, the following section will use examples from around the world as well as from other sectors to illustrate the potential benefits of sustainability standards.

4.3.1 Benefits

There are multiple benefits associated with the shift from conventional to sustainable production and trade, which benefit both companies and society as a whole. These are summarized in Table 18 and will be described in more detail below.

Table 18: Summary of added benefits associated to sustainability standards

<table>
<tr><th colspan="5">Benefits added</th></tr>
<tr><th></th><th>Private Economic Benefits</th><th>Public Economic Benefits</th><th>Social Benefits</th><th>Environmental Benefits</th></tr>
<tr><td rowspan="3">Direct benefits</td><td>Increased access to global markets (% or US$/year).</td><td rowspan="3">Increased revenues from taxes on agribusiness as result of increased private profits (US$/year).</td><td rowspan="3">Income generation for the rural population (US$/year).</td><td rowspan="3">Improved soil quality (% of degraded agricultural land).</td></tr>
<tr><td>Increased productivity (US$/ha).</td></tr>
<tr><td>Premium market price (%; US$/year).</td></tr>
<tr><td rowspan="3">Indirect benefits</td><td rowspan="2">Additional revenues from improved corporate reputation/customer loyalty (US$/year).</td><td rowspan="3">Additional fiscal space to support the expansion of sustainable organic agriculture (US$/year).</td><td>Poverty reduction (% of the poor population).</td><td rowspan="3">Preservation of forest cover (forest cover as % of total land).
Improved air quality (Air Quality Index) as a result of reduced emissions.</td></tr>
<tr><td>Increased access to water (% of population).</td></tr>
<tr><td>Increased revenues in other sectors, e.g. fisheries and forestry, as result of reduced environmental impact (US$/year).</td><td>Improved nutritional levels (kcal/person/day).</td></tr>
</table>

Source: UNEP (2015)

4.3.1.1 Economic Benefits

This section presents examples of the positive changes that were made by companies and organizations in order to comply with sustainability standards, and the potential of such standards to influence companies' profits.

Participating in standards can significantly help improve producers' yields, which in turn generates benefits for farmers. For instance, Rainforest Alliance states that in Côte d'Ivoire, the certified cocoa farms are more efficient and produce 40 per cent more cocoa per acre than non-certified farms (Rainforest Alliance, 2012) and in El Salvador, coffee farms that received technical assistance to prepare for Rainforest Alliance certification increased their harvests by an average of 89 per cent as compared to the previous year (compared to a 25 per cent increase among non-certified farms) (Romanoff, 2008). An analysis of the impact of Global G.A.P. Standards on African producers revealed that the implementation of these standards at the farm level increased the quality of production and reduced the amount of rejection by the buyer (Kuworno and Mustapha, 2013).

Other labels also have the potential to provide farmers with improved income. For instance, the Fairtrade Label Organization offers stabilized prices for its producers. There is a Fairtrade Label Organization Minimum Price for many products, which covers the costs of sustainable production even when the market prices fall. This is paid on top of the agreed Fairtrade Label Organization price, and producers decide democratically how to use it (Fairtrade Label Organization, n.d.). The participation in these standards gives farmers more bargaining power vis-à-vis their buyers, and enables them to switch more easily from one buyer to another and to negotiate better prices.

The use of standards also can give the producers a competitive advantage. The markets for certain non-certified wood products, for example, have shrunk, whereas the certified wood markets have grown. In the EU, the demand for tropical sawn wood dropped an average of 13 per cent per year between 2005 and 2010, whilst the market share of FSC-certified sawn wood in Western Europe grew significantly during the same period (Rainforest Alliance, 2015b). Similar situations occurred in the markets of other certified products. LEAF, a British certification, saw its market share in the UK fruit and vegetable market go up from 18 to 25 per cent between 2012 and 2014 (LEAF, 2015). This competitive advantage also results in higher incomes. An analysis of Pennsylvania's sales record demonstrates that the certified timber was sold to FSC-certified Chain-of-Custody buyers brought in revenues that were roughly 10 per cent higher than would have been the case in the absence of certification (Bensel et al., 2008).

Standards also generate consumer awareness of certified products, which in turn increases consumers' willingness to pay. In terms of exports and trade opportunities, the benefits identified included:

- improved access to sustainable global value chains, including highly competitive markets in developed countries;
- increased exports of certified products;
- increased profits due to an improved reputation;
- reduced average tariffs imposed by importing countries on certified products (UNEP, 2015).

Finally, when the revenues of private actors improve, the public sector can also benefit, as tax revenues increase (UNEP, 2015).

4.3.1.2 Social Benefits

A social benefit is the increase in the welfare of a society as a result of a particular course of action. Indicators of social benefits include employment creation, income generation, and improvement in the well-being of employees and local communities (UNEP, 2015).

Social benefits generated by sustainability standards include, for example, the employment opportunities created for local workers, and the use of local suppliers. As a result, investments and earnings stay within the local communities and trigger economic development. Crop rotation as a means to reduce weed and insect infestation without using agrochemicals increases labour requirements with 20 to 30 per cent compared to

conventional farms. These benefits usually go to the local community and help reduce poverty (Herren et al., 2012).

Sustainability standards also encourage more skilled work. For example, when the use of agrochemicals is reduced by measures like integrated pest management, workers need to be trained in pruning, shade adjustment and phytosanitary harvesting methods. As a result, a larger proportion of the production cost is paid to workers within the local community (Herren et al., 2012). In a study about Biotrade in Namibia, UNEP (2012b) found that organic certification could generate additional income for women, depending on the productive activities.

4.3.1.3 Environmental Benefits

Environmental benefits are the gains in environmental services or other ecological properties attained by an action (Efroymson et al., 2003). Some benefits can be related, for instance, to biodiversity, climate change mitigation, water quality, land and forest degradation, chemicals or waste.

Sustainability standards, can, for example, promote the conservation of biodiversity. An analysis by Bengtsson et al. (2005) found that 53 out of 63 studies show higher species richness in organic agriculture systems than in conventional systems. A study of Brazil's forests found that 100 per cent of FSC-certified enterprises had established or was in the process of establishing legal reserves for biodiversity conservation, compared to 57 per cent of non-certified businesses (IMAFLORA, 2009). In the Maya Biosphere Reserve in Guatemala, deforestation was 20 times higher in the reserve's protected areas than in FSC concessions, and the incidence of forest fires was 104 times higher in protected areas, with 10.4 per cent of land burned versus 0.1 per cent in certified concessions (Hughell and Butterfield, 2008).

Overall, standards also promote soil conservation. In Colombia, coffee farms that had obtained certification from the Rainforest Alliance were found to have a consistently higher richness and diversity of soil arthropods than non-certified farms (Rainforest Alliance, 2013). In addition, reviews comparing organic versus conventional agriculture suggest that "organic farming is superior in preserving and improving both the abiotic and the biotic aspects of soil quality" (Milder et al., 2012). Organic methods decrease the loss of topsoil and maintain soil nutrients and carbon more effectively than conventional methods (Gomiero et al., 2011).

Standards also indirectly benefit wildlife conservation by protecting the entire ecosystem. For instance, ape densities were found to be higher in FSC-certified forests (and those in the process of getting certified) than in other forestry concessions (WWF, 2009). Also, a study of seven timber companies in Gabon found that FSC-certified companies offered better protection to wildlife, implementing 86 per cent of best practices, while non-certified companies implemented only 29 per cent (Rayden and Essame Essono, 2010).

Standards also promote water conservation and water quality improvement. For example, organic systems are known to capture and retain up to 100 per cent more water than conventional methods (Milder et al., 2012). Moreover, a 2012 study of cocoa farms in Côte d'Ivoire showed that 80 per cent of certified farms implemented water protection measures, against only 17 per cent of the non-certified farms (Rainforest Alliance, 2012).

4.3.2 Avoided costs

Besides added benefits, sustainability standards also help to avoid certain costs to companies, the public sector or society as a whole. Table 19 summarizes some economic, social and environmental avoided costs.

Table 19: Summary of savings and avoided costs associated to sustainability standards

Costs avoided				
	Private Economic Avoided Costs	Public Economic Avoided Costs	Social Avoided Costs	Environmental Avoided Costs
Direct benefits	Reduced use of fertilizers and pesticides (US$/year). Reduced water intensity (US$/ton).	Avoided costs of food subsidies, as a result of increased food production and overall well-being (US$/year).	Reduced employment and income losses from soil degradation and abandonment (US$/year)	Reduced GHG emissions and associated costs (tCO_2 e/year; US$/year).
Indirect benefits	Reduced productivity losses from soil degradation (US$/year).	Reduced costs of groundwater purification (US$/year).	Reduced health costs due to malnutrition and water pollution diseases (US$/year) Reduced costs of urbanization from abandoned agricultural land, e.g. subsidies to the urban poor (US$/year)	Reduced costs of water pollution, e.g. from nitrogen concentration (ug/l; US$/year).

Source: UNEP, 2015

4.3.2.1 Economic avoided costs

The economic avoided costs in the private sector are mostly related to lower inputs necessary for production, due to a more efficient use of resources. This could mean a lower use of pesticides and fertilizers, as well as lower electricity and fuel consumption. In a survey by the Rainforest Alliance, 28.43 per cent of their farmers mentioned a reduction in the use of agrochemicals due to the reduction of plagues and plant illnesses (Wijn, 2012). In terms of public avoided costs, food subsidies are avoided, as food production is higher and the overall well-being improved (UNEP, 2015).

4.3.2.2 Social avoided costs

Standards also improve the health of farmers and people around farms. For example, in a survey among Rainforest Alliance-certified coffee farms in Nicaragua, farmers reported that since earning certification in 2004, health costs had dropped. This was due to a combination of fewer agrochemicals, storage and handling of agrochemicals by trained individuals, and the improvement of hygiene on the farms, with the installation of disposal pits for waste, and clean toilets, baths and hand-washing facilities (SAI, 2010). Additionally, reducing the use of agrochemicals also leads to lower levels of water contamination, which has a positive effect on the health of the wider population. Furthermore, standards usually have requirements related to product quality, like the requirement to have mechanisms in place to control for food hazards, and to avoid contamination with harmful substances, leading to safer products (FAO, 2013).

4.3.2.3 Environmental avoided costs

In terms of environmental avoided costs, these are related to the avoided damage to soils, ecosystems and biodiversity degradation. For example, a shift to organic agriculture is likely to reduce soil contamination because of a lower use of pesticides and fertilizers (UNEP, 2015). This lower use also leads to avoided costs in terms of restoration of ecosystems, as pesticides and fertilizers often cause damage to flora and fauna.

4.4 Costs of sustainability standards or eco-labels

Even though sustainability standards and eco-labels lead to important benefits, these initiatives do not come without a cost. These costs can be classified as investment and operating costs, and are summarized in Table 20.

Table 20: Summary of costs associated to sustainability standards

Private Costs			Public Costs
Capital and Operation & Management Costs	Training Costs	Certification Costs	
Cost of organic pesticides and fertilizers (US$/kg; US$/ha). Cost of water- and energy-efficient technology (US$/ha). Operation & Management Costs (US$/ha). Labour costs (US$/ha). Energy costs (US$/ha). Water costs (US$/ha).	Training of farmers in sustainable agriculture technologies and processes (US$/person). Training of law enforcement officials (US$/person).	Application fee (US$). Annual renewal fee (US$/year). Assessment on annual production or sales fees (US$/year). Inspection fees (US$/year).	(Economic) incentives for purchasing organic inputs, irrigation techniques, and other technologies, and for investing in renewable energy, etc. (US$/kg).

Source: UNEP, 2015

4.4.1 Private costs

Operating costs are expenses associated with the maintenance and administration of a business on a day-to-day basis; while investment costs refer to the purchase of goods that will be used to create wealth. More specifically, for the case of sustainability standards, investments could be for new machinery or for training, while operating costs are related to the certification itself, such as the cost of the annual certification fee (UNEP, 2015).

A study on the costs, advantages and disadvantages of cocoa certification, commissioned by the International Cocoa Organization (ICCO, 2012), identified 6 additional costs implied in the adoption of a standard scheme.

1. Administrative costs associated with the adoption of standards, such as an internal control system, which requires human resources, office space, transport, internal audits, etc.

2. Additional labour costs, as most schemes set out requirements on the wage level that a farmer needs to pay.

3. Investments in human capital need to be made, as people must be trained in order to comply with the standard's requirements, such as agrochemical handling and application, good agriculture practices, safety, etc. This will generate a training cost for the company.

4. Investments in physical capital need to be made, such as the construction of agrochemical storage facilities, the purchase of protective equipment, etc.

5. External auditing can represent a high cost for the company.

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Chain of custody costs can be incurred, since schemes sometimes set fees for other participants of the chain of custody to use the label. Also, these participants must be audited, which represents another cost, besides the additional costs of compliance.

The abovementioned private costs associated to sustainability standards and similar initiatives can be divided in three categories: 1) capital and operation & management costs, 2) training costs and 3) certification costs.

4.4.2 Public costs

Some costs associated to the public sector have also been identified. These are mostly related to any incentives and subsidies that governments may provide for certifications and/or required investments in renewable energy, the improvement of irrigation systems, organic inputs or technologies, and other issues.

4.5 Challenges for sustainability standards or eco-labels in Chile's agricultural sector

In spite of the numerous potential benefits of sustainability standards or eco-labels, the participation in Chilean sustainability initiatives is still quite low (with the exception of the Sustainability Code of the Wine Industry, which currently reaches 70 per cent of the market). Organic products also form a small segment of total exports, and their share has even decreased over the last couple of years. The same also holds true for the international initiatives. When considering that the number of export-oriented agriculture and livestock producers is over 19 thousand (ODEPA, 2007), the following examples put the current level of certification in Chile into perspective:

- Only fifteen small producers and two farms with employees have certification from Fairtrade International.
- Just a handful of Chilean producers (around 30) have certification from the Rainforest Alliance (Rainforest Alliance, 2015c).

- Only two associations are part of IFOAM Organics International.
- Six companies have certification from the Marine Stewardship Council.
- Three companies have certification from GMP+ Feed.
- Only one company is part of MPS-ABC.
- Two companies are part of the Safe Quality Food Program – SQF.

Only the adoption of Best Aquaculture Practices and the British Retail Consortium (BRC) is a little more widespread. Best Aquaculture Practices has about 75 installations (representing 31 companies) and 227 companies participate in BRC.

The different stakeholder consultations brought several possible underlying reasons to the surface, which could explain the low adoption of sustainability standards:

1) A lack of knowledge about the potential benefits of sustainability standards and eco-labels;

2) A lack of knowledge about the ways to achieve better performance in terms of agricultural practices;

3) Limited information about the different initiatives and the specific steps and procedures to join them;

4) The amount and diversity of initiatives, all with different sets of requirements, which do not always align with each another;

5) A lack of economic resources, since any change in agricultural practices requires financial means and a time investment.

Addressing these challenges would allow producers to reap the vast array of benefits that sustainability standards and eco-labels could generate. This is even more important considering the challenges of the sector in international markets, and the potential benefits to society as a whole.

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5 Standards and Eco-labels: Main Characteristics and Components

In light of the low adoption rates of sustainability standards, an objective of this study is to suggest the design and characteristics of a potential sustainability standard that could help improve the export potential of Chile's agricultural sector. The first step is to understand the demand patterns, and the main sustainability standards and eco-labels at work in the target markets. This section will first describe the sources of information and the selection process of the different initiatives, and then provide a detailed analysis of ten parameters that will inform the design of a possible sustainability standard.

5.1 Sources of information

The sources of information are Standards Map, as well as summary texts about the different initiatives. ISEAL Alliance, which is dedicated to the expansion of sustainability standards and the enhancement of their credibility, also provided relevant data, such as the Standard Setting Code and Credibility Principles. Sustainability Compass, an institution that provides information about practical tools, was also used, as well as Sustainability Compass Business Procurement,[10] a database on the sustainability standards. The report "The State of Sustainability Initiatives Review 2010: Sustainability and Transparency" (Potts et al., 2010) was also helpful, as it classifies and compares certain characteristics of the initiatives in question.

10 For more information, please see: business.sustainability-compass.com/

The abovementioned sources were complemented with information provided by the different sustainability standards or eco-labels, as well as specific studies about some of the initiatives.

5.2 Selection of initiatives

Given the large amount of sustainability standards and eco-labels (see, for example, section 4.2.1), the analysis was carried out with certain filters. The first one selected only the initiatives that were applicable to the agricultural sector. The second filter was applied through Standards Map, which allowed filtering by place of production (Chile) and destination markets. Third, in order to reflect the reality of Chilean producers and processors, the standards and eco-labels that were mentioned by different stakeholders in the second workshop of this project were also included. Finally, the standards and eco-labels that are members of ISEAL Alliance and focus on agriculture were added. Altogether, this generated a list of 31 initiatives (Table 21).

Table 21: International initiatives analyzed

Initiatives analyzed				
4C Association	Marine Stewardship Council	GMP+ Feed	Ethical Trading Initiative	Fair for life
USDA Organic Program	Food Alliance	MPS-ABC	EU Organic Farming	Soil Association Organic Standards
Fairtrade Label Organization	International Organization for Standardization (ISO)	LIFE (Lasting Initiative for Earth) Certification	Safe Quality Food Program	Global Ecolabelling Net
Rainforest Alliance – Sustainable Agriculture Network	International Food Standard (IFS Food)	Unilever Sustainable Agriculture Code	Global Reporting Initiative	
IFOAM Organics International	BRC Global Standard	International Sustainability and Carbon Certification (ISCC)	Sedex Global	
Global G.A.P.	Best Aquaculture Practice	Bio Suisse	Verified Carbon Standard	
SAI- Sustainable Agriculture Initiative	Declaration of Abu Dhabi	LEAF Marque	EcoVadis	

Source: Own elaboration

5.3 Characteristics of standards and eco-labels

This section will analyze the different characteristics of the initiatives mentioned in the previous section, in order to inform the establishment of a new standard or initiative. The characteristics that are being evaluated are summarized in Figure 22, and include administrative, social and/or environmental elements.

Figure 22: Characteristics of a standard or eco-label to be evaluated

Source: Own elaboration

5.3.1 Type of initiative

Sustainability initiatives can fit into several different categories, including protocols, standards and/or eco-labels. The definitions are presented in Figure 23. The arrows show how the initiatives are related, since a protocol can be a standard if there is a certification process, while a standard can be an eco-label if there is a seal or label that provides information to the final consumer.

Figure 23: Definitions of different kinds of sustainability initiatives

Protocol

A protocol is a tool to describe, guide and measure the sustainability performance of products and companies, allowing a comparison and improvement of opportunities, according to internationally recognized best practices.

Standard

Different practices and criteria that a company and/or product needs to comply with in order to achieve a certain sustainability level.

Standard System with an assurance mechanism

A standard needs a mechanism to verify compliance, and to evaluate the fulfilment of the different criteria of the standard

Eco-label

Logo or label to make the products that are compliant to a standard recognizable. This is usually accompanied by a traceability system.

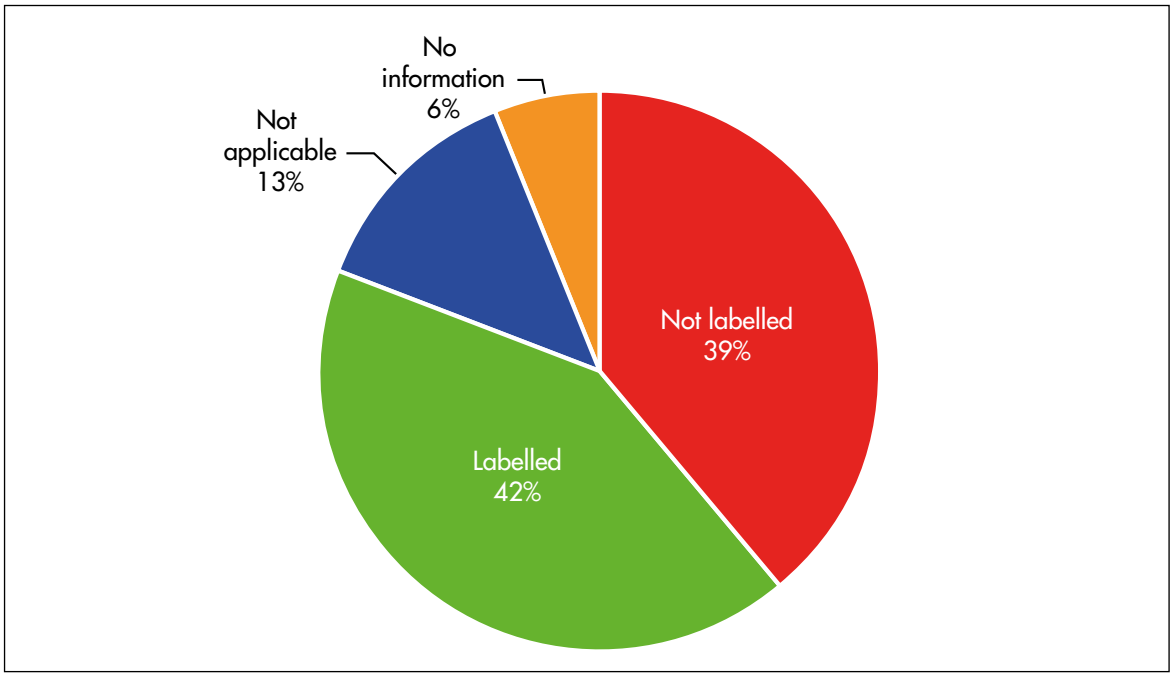
Source: Own elaboration with information from Hydropower Sustainability Assessment Protocol (2015) and ISEAL Alliance (2013; 2015b)

label destined at the final consumer, while 39 per cent do not. The findings have been summarized in Figure 24. However, out of this 39 per cent, 33 per cent of the initiatives do have a logo, which is however not meant for the final consumer, but for business-to-business operations, which highlights the relevance of sustainability standards for supplier–retailer relationships. This is the case of Global G.A.P., IFS Food, BRC Global Standards and MPS-ABC.

During the different workshops organized in the context of this study, the stakeholders seemed to agree with the idea of favouring business-to-business logos over logos targeted for the final consumer. One of the reasons was that only a small portion of consumers is equipped to make an informed decision about the many labels included on a product.

When evaluating the different initiatives, it is important to take their specific objectives into account. If the objective is to improve the practices of an industry, for instance, a protocol could be enough. However, when it is relevant to earn recognition from other actors in the market, it may be necessary to have a certification process in place to ensure compliance with certain requirements and goals.

Figure 24: Label to final consumer



Source: Own elaboration with information from International Trade Centre (2015a)

5.3.2 Expected level of change

Another important aspect of a standard is the level of change that is expected. When a standard has minimum requirements, known as the "entry level", a larger amount of companies can achieve them, but social and environmental benefits can be expected to be lower (although the overall benefits could be higher if more companies comply with the standard). Conversely, when the bar is set to reflect best practices ("high bar"), only a handful of companies will achieve them, but the social and environmental benefits created by these companies will be more significant. This is the trade-off between rigour and accessibility (two of the principles as established by ISEAL Alliance, see Box 4 for details). The expected level of change is highly dependent on the objective of each initiative.

Box 4: Ranking in global exports in 2013

ISEAL Alliance has established ten Credibility Principles (ISEAL Alliance, 2015a) that should govern sustainability standards:

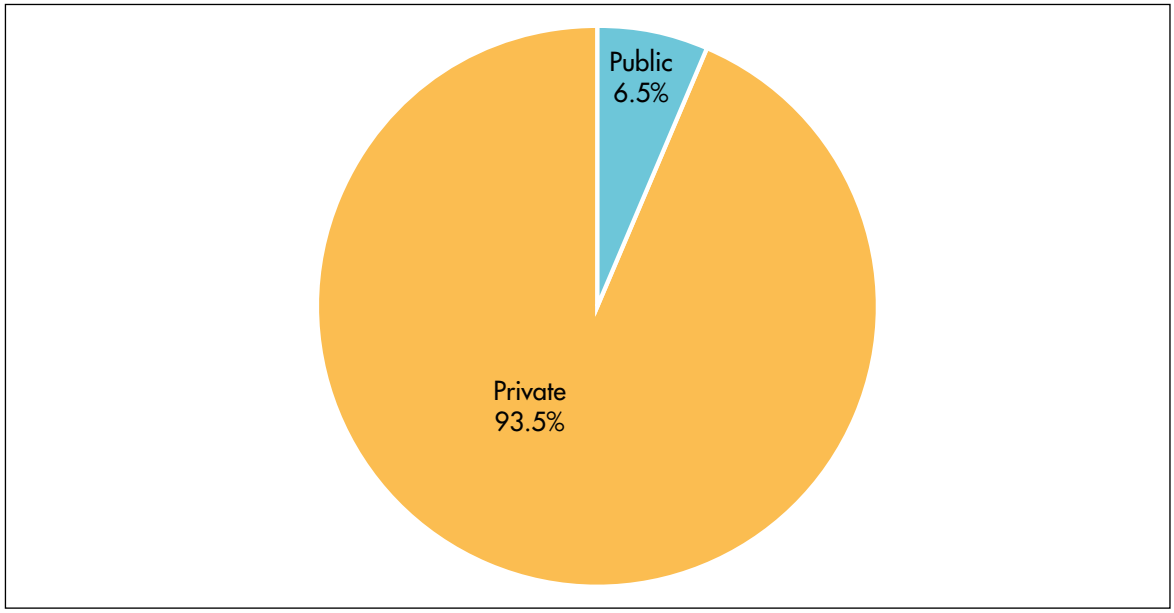
1. **Sustainability:** Standards scheme owners clearly define and communicate their sustainability objectives and their approach to achieving them.
2. **Improvement:** Standards scheme owners seek to understand their impacts, and measure and demonstrate progress towards their intended outcomes.
3. **Relevance:** Standards are fit for purpose. They address the most significant sustainability impacts of a product, process or business; only include requirements that contribute to their objectives; and are adapted to local conditions.
4. **Rigour:** Standards are set at a performance level that results in measurable progress towards the scheme's sustainability objectives, while assessments of compliance provide an accurate picture of whether an entity meets the standard's requirements.
5. **Engagement:** Standards engage a balanced and representative group of stakeholders in standards development.
6. **Impartiality:** Standards identify and mitigate conflicts of interest throughout their operations, particularly in the assurance process and in governance.
7. **Transparency:** Standards systems make relevant information about the development and content of the standard freely available.
8. **Accessibility:** To reduce barriers to implementation, standards systems minimize costs and overly burdensome requirements.
9. **Truthfulness:** Claims and communications made by actors within standards systems and by certified entities about the benefit or impacts that derive from the system or from the purchase or use of a certified product or service are verifiable, not misleading, and enable an informed choice.
10. **Efficiency:** Standards systems refer to or collaborate with other credible schemes to improve consistency and efficiency in standards content and operating practices.

5.3.3 Who should lead a sustainability initiative

The entity that is in charge of a standard could belong to the public or the private sector. Overall, in the sample of 31 initiatives used for this study, it was found that most standards are led by the private sector (94 per cent, see Figure 25). USDA Organic Seal and EU Organic Farming are the only initiatives in the sample that are led by the public sector. Nevertheless, engaging the public sector is fundamental (See Box 5), particularly in terms of financial and technical aid for small to medium companies (ITC, 2014). According to UNEP and FAO (2014), the public sector can help small producers with:

- Awareness campaigns spreading information about small producers;
- Capacity building;
- Encouraging and facilitating the participation of local actors in processes of consultation, and providing information regarding the creation and/or characteristics of sustainability initiatives;
- Direct and indirect financial support;
- The appropriate legal framework and institutions dedicated to assess how producers make use of the standard;
- Interaction with the owners of private standards to safeguard the interests of vulnerable groups.

Figure 25: Types of initiatives in the sample used for this study



Source: Own elaboration with information from ITC (2015)

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Box 5: Roles of public and private actors in the functioning of voluntary food standards

UNEP and FAO (2014) identified the roles of public and private actors in a voluntary food standard, which are summarized in the figure below.

Standard setting: public authorities may give an advisory or binding opinion. They can also take measures to ensure that standards are created impartially.

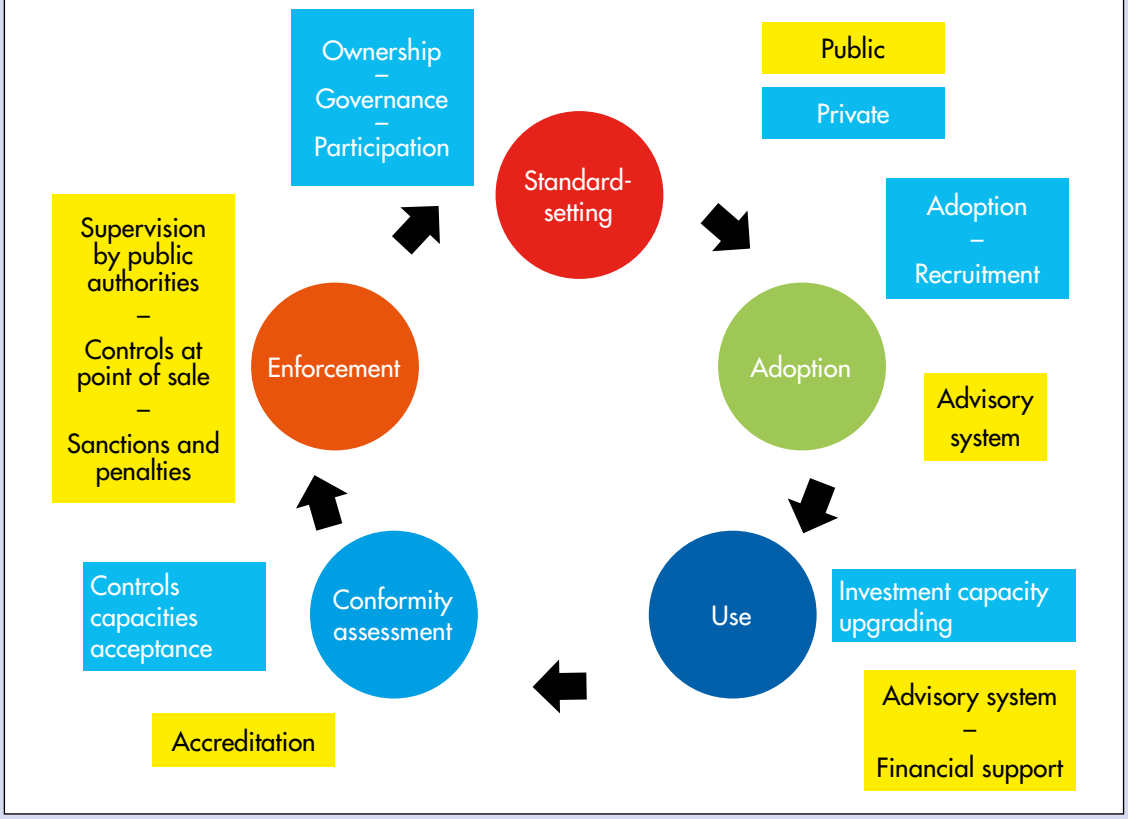
Adoption: public authorities can be neutral or they can have a preventive role through direct (subsidies) and indirect (exemptions) financial support, or by subsidized training.

Use: public authorities can support compliance to a standard with financial support and capacity building.

Conformity assessment: The control can be entirely borne by the state, delegated to a public institution, or delegated to the users. The international recognition of accreditation bodies is also important, reducing the cost of testing and certification for users of the country.

Enforcement: authorities can have an active role against traders abusing the standard. This is important because it can increase the confidence of users of the standard. Authorities should also help guarantee clear consumers' information, control of the labelling and the claims, and dissemination of neutral and objective information.

Roles of public and private actors in the functioning of voluntary food standards



Source: UNEP and FAO (2014)

5.3.4 Level of verification

Different actors can take responsibility for the results of an initiative, which impacts the reliability of the results. The different levels are:

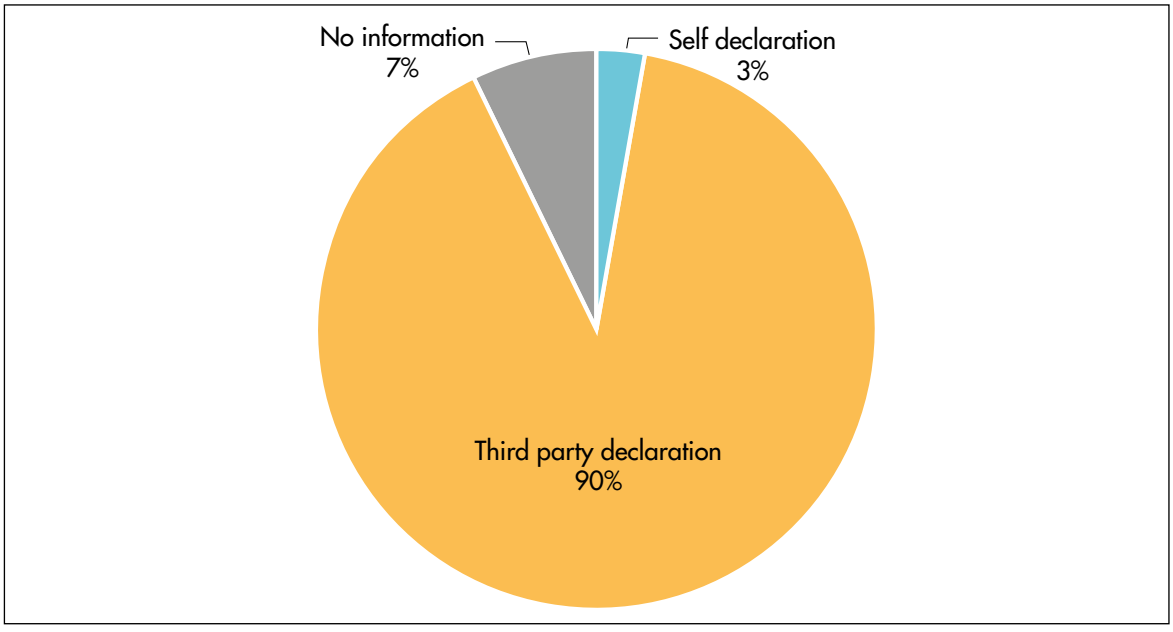
- Self-declaration: when a company verifies itself, usually following certain guidelines;
- Second-party verification: when a related party is responsible for the verification, for example when a retailer verifies the information of its suppliers;
- Third-party verification: a completely independent third party is responsible for the verification.

90 per cent of the initiatives in the sample have third-party verification, whereas only 3 per cent have self-declaration (Figure 26). The latter percentage corresponds to just one initiative, the Unilever Sustainable Agriculture Code, where suppliers assess themselves against the code. Currently, Unilever is evaluating the possibility to move to third-party verification. The preference for third-party verification can be explained by the high level of assurance to buyers and consumers of a product. The Global Reporting Initiative (GRI) identifies five benefits of third-party verification (Global Reporting Initiative, 2013):

- Increased recognition, trust and credibility;
- Reduced risk and increased value;
- Improved Board and CEO level engagement;
- Strengthened internal reporting and management systems;
- Improved stakeholder communication.

While third-party verification has considerable benefits, it is also the most expensive of the three options, and can be prohibitive to some small to medium-size companies and therefore reduce the reach of the standard. It is important to find a proper balance between accessibility and rigour.

Figure 26: Level of verification

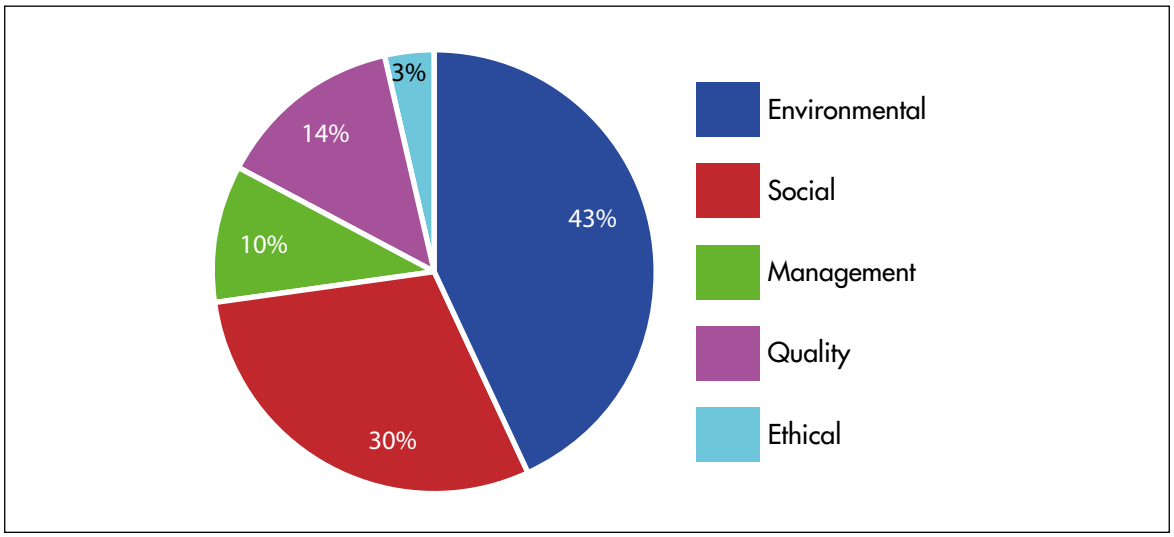


Source: Own elaboration with information from ITC (2015)

5.3.5 Requirements

The initiatives use different requirements to verify compliance. On average, the initiatives use 110 requirements, with the lowest amount being 23 (BRC Global) and the highest 221 (SAI Platform). These requirements can have different focus areas. Standards Map distinguishes five focus areas, including environmental, social, management, quality and ethical requirements. The summary for all the initiatives is presented in Figure 27. Overall, 43 per cent are environmental requirements, followed by social (30 per cent), quality (14 per cent), management (10 per cent) and ethical requirements (3 per cent). None of the initiatives has only formulated requirements for one of the five areas, and only one initiatives has requirements for just two focus areas.[11]

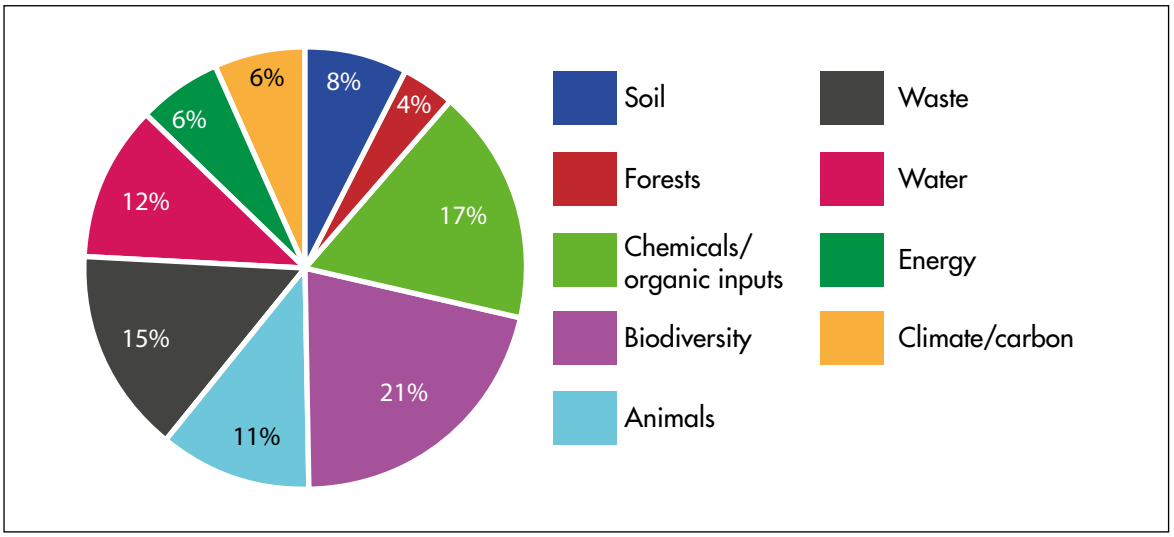
Figure 27: Focus areas of initiatives



Source: Own elaboration with information from ITC (2015)

Figures 28 to 32 include more detail about the different areas. For example, within the environmental requirements, the care for biodiversity (21 per cent of total requirements), the use of chemicals (17 per cent) and waste management (15 per cent) are the most relevant. Among the social requirements, employment and employee relations are the most relevant (36 per cent), followed closely by working conditions and social protection (31 per cent).

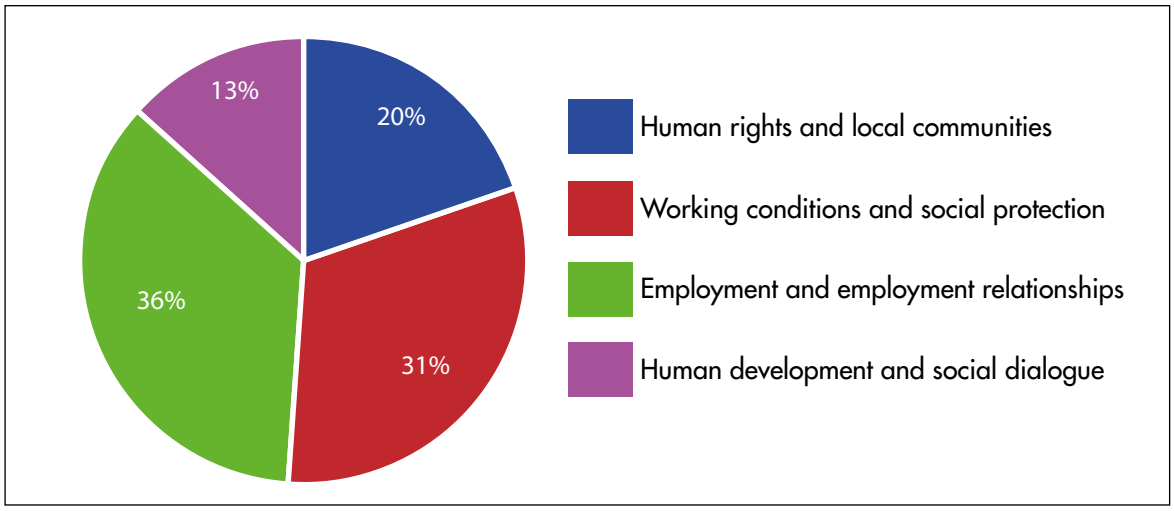
Figure 28: Sub-areas within the category of environmental requirements



Source: Own elaboration with information from ITC (2015)

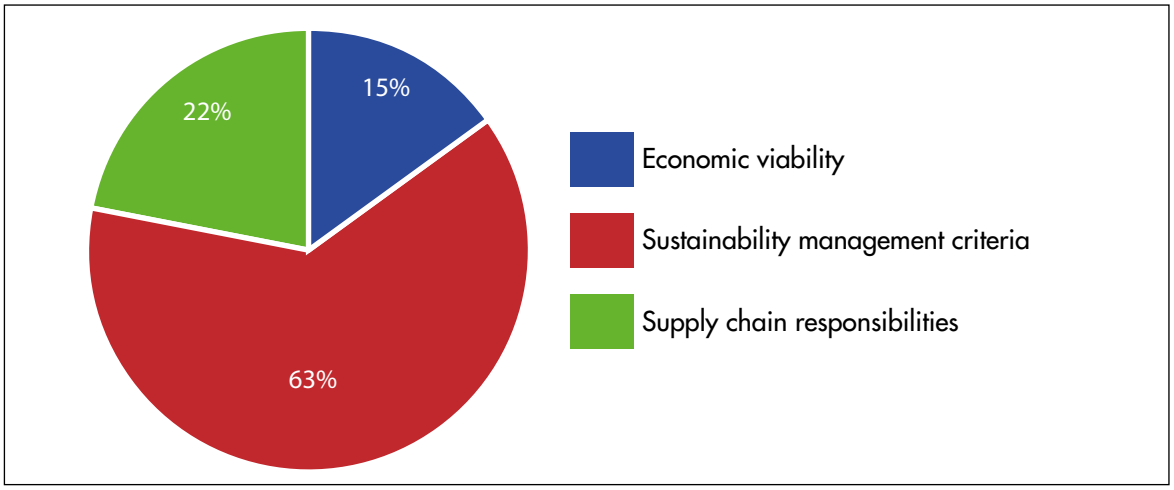
11 Only MPS-ABC has 97 per cent environmental requirements, and the remaining 3 per cent in the area of management.

Figure 29: Sub-areas within the category of social requirements



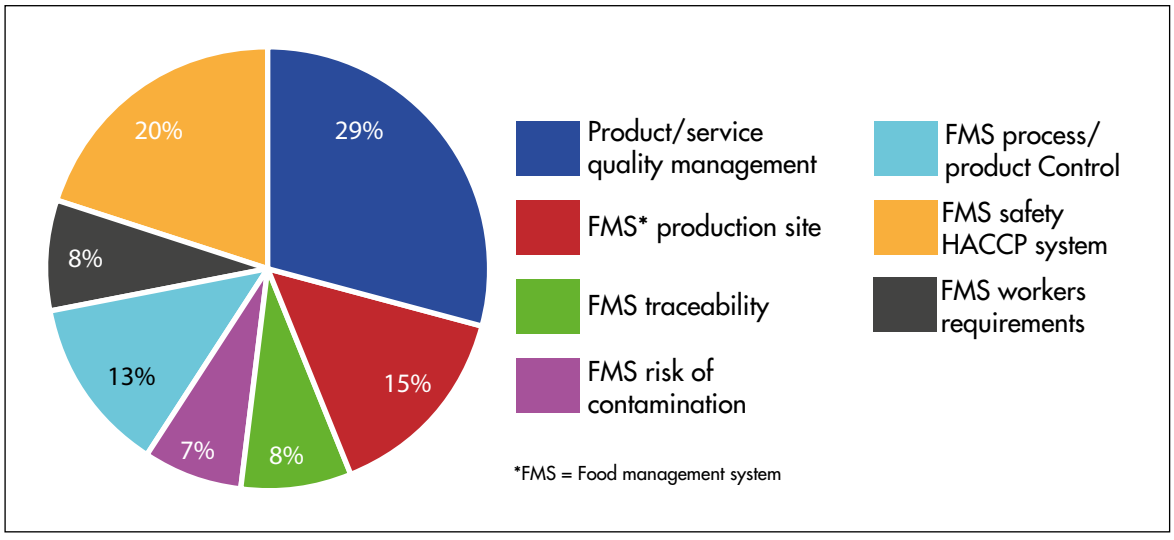
Source: Own elaboration with information from ITC (2015)

Figure 30: Sub-areas within the category of management requirements



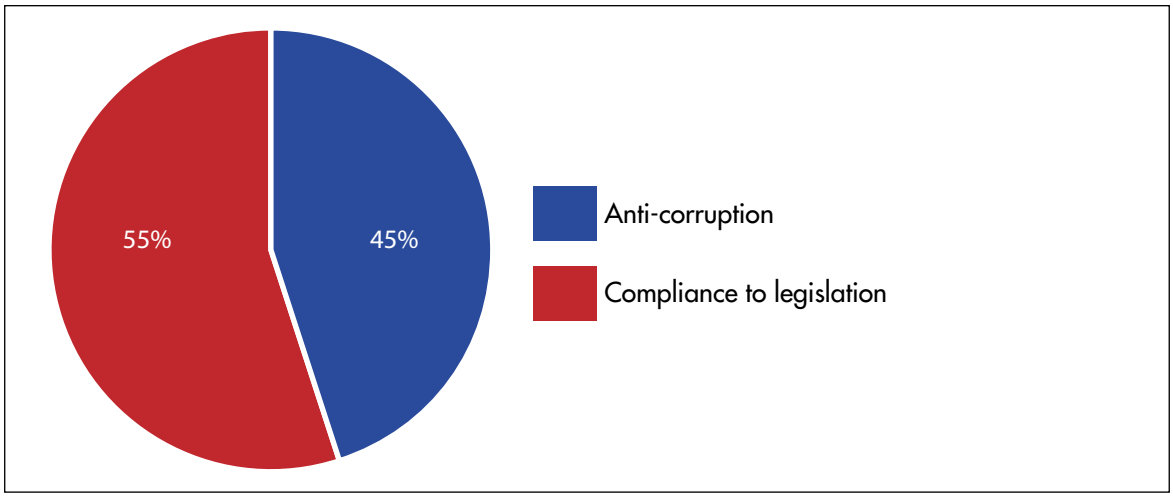
Source: Own elaboration with information from ITC (2015)

Figure 31: Sub-areas within the category of quality requirements



Source: Own elaboration with information from ITC (2015).

Figure 32: Sub-areas within the category of ethical requirements



Source: Own elaboration with information from ITC (2015).

5.3.6 Focus

The standards and eco-labels assessed have different focuses. This study distinguishes the following options:

- Administration: the focus is on the way the organization is managed.
- Process: the standard specifies good practices that a company should follow.
- Final results: the focus is result-oriented and has ways to measure results, but does not specify the practice that needs to be followed to achieve that result.

In recent times, given the need for standards to be rigorous and truthful (See Box 5: ISEAL Alliance's Credibility Principles), the focus of current initiatives is moving towards final results, which can provide quantitative results that are more credible for buyers and final consumers. However, final result is more difficult (and expensive) to implement, quantify and verify. The best focus to choose is highly dependent on the objectives and the current situation of the producers/exporters.

5.3.7 Compliance assessment

Compliance to a sustainability standard is subject to several requirements. Each standard has different rules about the number of requirements that need to be complied with before the certification is granted. Some standards give companies the opportunity to improve their compliance with the criteria. The ensemble of these rules is known as compliance assessment, and this study distinguishes different methods.

- Critical criteria: certain practices are mandatory for the certification.
- Scoring: each requirement is scored against certain criteria. The total score of a company is determined and should be higher than a certain threshold in order to obtain certification of compliance.
- Risk-based: a risk assessment is carried out in order to evaluate which criteria are the most important, depending on the product and/or company.
- Traffic light: practices are evaluated as good (green), acceptable (yellow) or needs improvement (red), with a pass requiring an acceptable average.
- Corrective actions: compliance with baseline or entry criteria is required for initial certification, and additional criteria are added over time (usually with a work plan).

Table 22 is a summary of how the different initiatives assess compliance. Only 4C Association has all five options, while none of the initiatives uses only one method. Two methods is the most common, and the two methods most commonly used are *critical criteria* and *corrective actions* (USDA Organic Seal, IFOAM, Global G.A.P., BRC Global Standards, among others). In other words, most of the initiatives have important

requirements that need to be met, but at the same time they give the option for companies to work on those requirements that need improvement in order to have their compliance certified. The method of scoring is also widely used, for example by the six initiatives that use a mixture of *critical criteria, scoring* and *corrective* actions (i.e. GMP+, Life Certification, Unilever Sustainable Agriculture Code).

Table 22: Compliance assessment

Initiative	Critical criteria	Scoring	Risk-based	Traffic light	Corrective actions
4C Association	X	X	X	X	X
USDA Organic Seal	X				X
Fairtrade Label Organization	X	X	X		X
Rainforest Alliance – Sustainable Agriculture Network	X	X			X
IFOAM	X				X
GLOBAL G.A.P.	X				X
SAI-Platform	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
MSC		X			X
Food Alliance	X	X			
IFS Food	X	X			X
BRC Global Standard	X				X
Best Aquaculture Practices	X				X
GMP+ Feed Certification	X	X			X
MPS – ABC	X	X		X	X
LIFE (Lasting Initiative For Earth) Certification	X	X			X
Unilever Sustainable Agriculture Code	X	X			X
ISCC (EU – PLUS)	X	X	X		X
Bio Suisse	X				X
LEAF Marque	X				
Ethical Trading Initiative	X				X
EU Organic Farming	X				X
Safe Quality Food Program – SQF	X				X
Global Reporting Initiative	Not applicable	X	X	Not applicable	Not applicable
Sedex Global (Supplier Ethical Data Exchange)			X		X
Verified Carbon Standard – VCS	X				X
EcoVadis		X		X	X

Initiative	Critical criteria	Scoring	Risk-based	Traffic light	Corrective actions
Fair for Life	X	X			X
Soil Association organic standards	X				X
Global Ecolabelling Net	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Source: Own elaboration with information from ITC (2015)

5.3.8 Scope

The initiatives mapped can have different scopes or objectives, which correspond to their main activities. According to Potts et al. (2010), the different options include:

- Standard-setting: the initiative develops a standard.
- Framework development: the initiative provides guidance for decision-making or action to achieve an objective.
- Certification: the organization acts as a third party and gives assurance that a product, process or service is in conformity with a certain standard.
- Accreditation: the organization acts as an authoritative body that evaluates and formally recognizes a certification programme.
- Acting as an independent project: a group that might influence or lead to the development of a voluntary standard.
- Marketing and labelling: the primary business is marketing and/or labelling.

Table 23 presents the results for the 31 initiatives. Most of them work as *standard-setting* organizations (24), while several work in *framework development* (12) and *certification* (7). Overall, only three organizations have three objectives, but it is not uncommon to find initiatives with two (12), which are usually *standard-setting* and *framework development*, or *standard-setting* and *certification*.

Table 23: Scope of initiatives

Initiative	Standard-setting	Framework development	Certification	Accreditation	Independent Project	Marketing and labelling
4C Association	X					
USDA Organic Seal	X		X			X
Fairtrade Label Organization	X					
Rainforest Alliance – Sustainable Agriculture Network	X		X			X
IFOAM		X		X		
GLOBAL G.A.P.	X	X				
SAI-Platform	X					
MSC	X	X				

Initiative	Standard-setting	Frame-work develop-ment	Certifica-tion	Accredita-tion	Independ-ent Project	Market-ing and labelling
Food Alliance	X					
ISO	X					
IFS Food	X					
BRC Global Standard	X					
Best Aquaculture Practices	X					
Declaration of Abu Dhabi	X					
GMP+ Feed Certification		X				
MPS – ABC	X	X				
LIFE (Lasting Initiative For Earth) Certification	X	X				
Unilever Sustainable Agriculture Code					X	
ISCC (EU – PLUS)	X	X	X			
Bio Suisse	X					
LEAF Marque	X	X				
Ethical Trading Initiative	X					
EU Organic Farming	X					
Safe Quality Food Program – SQF	X		X			
Global Reporting Initiative	X	X				
Sedex Global (Supplier Ethical Data Exchange)	X	X				
Verified Carbon Standard – VCS		X				
EcoVadis		X	X			
Fair for Life			X	X		
Soil Association organic standards	X		X			
Global Ecolabelling Net						X

Source: Own elaboration with information from ITC (2015)

5.3.9 What is being certified?

The standards vary in terms of what exactly they are certifying. They might be certifying a company as a whole, or a specific product/process, or they have criteria that are applicable to different products. The options are presented below:

- Generic systems: not limited to any particular product or process, since the criteria and indicators remain the same for all products or processes. Some examples include Social Accountability International (SAI), Ethical Trading Initiative, Sedex, Fair for life, and Global Ecolabelling Net.

- Integrated system: The initiative can certify an entire enterprise as a system. There are different criteria/indicators for each product/process. In the sample used for this study, only Global G.A.P., ISO and International Sustainability & Carbon Certification (ISCC) certified companies as a whole.

- Product/process-specific: the initiative contains specific criteria and indicators for a product or process, although it can be designed for several products. Most of the initiatives correspond to this option, as can be seen in Table 24.

Most of the initiatives are product/process-specific, but in Chile, the CPAs and the Sustainability Code of Wine are enterprise- rather than product-specific. According to the FAO's Sustainability Assessment of Food and Agriculture Systems (SAFA) Guidelines, the focus on an enterprise rather than a product enables a more comprehensive consideration of sustainability components like good governance and social well-being (FAO, 2013). Nevertheless, if the goal is to increase the exports of a sector through better business-to-business or business-to-consumer communication, it might be necessary to implement product-specific standards.

Table 24: What is being certified

Initiative	Generic system	Integrated system	Product/Process-specific
4C Association			X
USDA Organic Seal		X	X
Fairtrade Label Organization			X
Rainforest Alliance – Sustainable Agriculture Network			X
IFOAM			X
GLOBAL G.A.P.		X	X
SAI- Platform	X		
MSC			X
Food Alliance			X
ISO		X	
IFS Food			X
BRC Global Standard	–	–	–
Best Aquaculture Practices			X
Declaration of Abu Dhabi	–	–	–
GMP+ Feed Certification			X
MPS – ABC			X

Initiative	Generic system	Integrated system	Product/Process-specific
LIFE (Lasting Initiative For Earth) Certification			X
Unilever Sustainable Agriculture Code			X
ISCC (EU – PLUS)		X	X
Bio Suisse			X
LEAF Marque			X
Ethical Trading Initiative	X		
EU Organic Farming			X
Safe Quality Food Program – SQF			X
Global Reporting Initiative	X		
Sedex Global (Supplier Ethical Data Exchange)	X		
Verified Carbon Standard – VCS			X
EcoVadis	X		X
Fair for Life	X		
Soil Association organic standards			X
Global Ecolabelling Net	X		

Source: Own elaboration with information from ITC (2015)

5.3.10 Value chain segment coverage

A supply chain starts with the extraction and production of a raw material and ends with the consumption of the final product and the disposal of packaging material. In between, there are several economic activities such as processing/manufacturing, delivery, wholesaling and retailing. The traceability of products is an increasingly important issue, especially because chains are international and it is important for retailers and final consumers to know about the origins of the products or services they are purchasing.

Standards can differ in terms of the stages they cover, which has been visualized in Table 25. Almost all of them focus on the *production/extraction* and *conversion/processing* stages, which should not surprise given the agricultural focus of the initiatives analyzed, and in this sector, the main social, economic and environmental impacts occur during these stages. Besides, the *traceability* aspect is important for many initiatives. As previously mentioned, most have traceability databases that allow buyers and final consumers to know about the origins of their products.

Not many initiatives focus on the end use of the products (the only exceptions being Food Alliance, ISO, Ecovadis and Global Ecolabelling Net). This can also be explained, as companies have less control further down the supply chain, even though, for some products, the packaging could have significant environmental impacts as well. In this regard, companies could focus on the use of recycled and recyclable materials (if possible), on having a good product–packaging relationship, and on ways to encourage consumers to recycle packaging materials.

Table 25: Value chain segment coverage

Initiative	Production/ extraction	Conversion/ processing	Retailing	End use	Traceability
4C Association	X	X			X
USDA Organic Seal	X	X			X
Fairtrade Label Organization	X	X	X		X
Rainforest Alliance – Sustainable Agriculture Network	X	X			X
IFOAM	X	X	X		X
GLOBAL G.A.P.	X	X			X
SAI-Platform	X				
MSC	X				X
Food Alliance	X	X	X	X	X
ISO	X	X	X	X	X
IFS Food		X			X
BRC Global Standard		X	X		X
Best Aquaculture Practices	X	X			X
Declaration of Abu Dhabi	–	–	–	–	–
GMP+ Feed Certification	X	X			
MPS – ABC	X				
LIFE (Lasting Initiative For Earth) Certification	X	X			X
Unilever Sustainable Agriculture Code	X				X
ISCC (EU – PLUS)	X	X	X		X
Bio Suisse	X	X	X		X
LEAF Marque	X				X
Ethical Trading Initiative	X	X	X		
EU Organic Farming	X	X			
Safe Quality Food Program – SQF	X	X	X		X
Global Reporting Initiative	X	X	X		X
Sedex Global (Supplier Ethical Data Exchange)	X	X	X		X
Verified Carbon Standard – VCS	X	X			
EcoVadis	X	X	X	X	X

Initiative	Production/ extraction	Conversion/ processing	Retailing	End use	Traceability
Fair for Life	X	X			X
Soil Association organic standards	X	X	X		X
Global Ecolabelling Net	X	X	X	X	X

Source: Own elaboration with information from ITC (2015)

5.3.11 Possible Characteristics of a Sustainability Standard

Having discussed the different characteristics, this last section integrates the outcome of the stakeholder consultations, which have been extremely helpful for assessing which characteristics best suit the needs and address the challenges of Chile's export-oriented agriculture.

Section 5.3.1 described the types of initiatives, including protocols, standards or eco-labels. Given the objectives of the study, the stakeholders consider that a standard would suit the Chile's agriculture export sector better, mostly because a process of certification would increase the credibility vis-à-vis international buyers. An eco-label is not to the same extent esteemed by the stakeholders, since in their experience, logos or labels are not easily recognized by final consumers and can sometimes even create more confusion. Additionally, from a practical point of view, the large amount of information displayed on a product label and the vast amount of sustainability initiatives to choose from, make it difficult to add more logos. A protocol does not seem to be the most feasible option, since it only works as a guideline for companies and it does not involve an evaluation of their performance. The latter aspect is highly relevant, as the objective is to improve the international credibility of Chilean companies. However, using a protocol should not be ruled out as an option to enhance the performance of the industry, especially for public initiatives that try to encourage the adoption of better practices industry-wide. In fact, as mentioned in section 4.2.2, ODEPA is currently developing a Sustainable Agriculture Protocol. Its goal is to improve the sustainability performance of the entire industry, with an emphasis on small and medium farmers.

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According to the stakeholders, given the objectives of a sustainability initiative for the export-oriented agricultural industry, "high bar" is considered a more valid choice than "entry level". However, Chilean stakeholders also positively value "entry level" standards because these are necessary to improve the sustainability of the sector as a whole.

In terms of the focus of the initiative, previously presented in section 5.3.6, stakeholders believe that the sector might not be ready for "final results" and that it might be a good first step to improve the processes with guides and codes of good practice. Nevertheless, when the objective of a standard is to improve trade, reputation and access to new markets, "final results" is the most adequate option as it can result in improved international credibility.

With regard to the other characteristics, the opinion of the stakeholders is consistent with the results from the initiatives analyzed. For example, they agree that if the initiative is expected to improve the performance of agricultural exporters in international markets, it needs to be third-party verified. In order to assess compliance, the stakeholders expressed a preference for "critical criteria" and "corrective actions". They recognized that corrective actions allow for continuous improvement and intentionality, which are both qualities that are important for Chilean stakeholders. Only a small number of Chilean companies are engaged in sustainability, so it is important to reward those companies with the right disposition.

The preferences of the stakeholders are summarized in Table 26.

Table 26: Preferred characteristics of standards or eco-labels according to stakeholder input

Characteristic	Decision
Type of initiative	Standard
Expected level of change	High bar
Who should lead the sustainability initiative?	Private sector (with important involvement of public sector)
Level of verification	Third-party verification
Requirements	Mostly environmental and social
Focus	Final result
Compliance assessment	Critical criteria + Corrective actions
Scope	Standard-setting and Certification, or Standard-setting and Framework Development
What is being certified	Product-specific
Value chain segment coverage	Production/Extraction and Conversion/Processing

Source: Own elaboration

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6 Discussion, Conclusions and Further Steps

6.1 Discussion

As mentioned in the introduction, the objective of GE-TOP is to find positive relationships between trade opportunities and a green economy transition. According to the international evidence collected for the study and the experience and knowledge of Chilean stakeholders, sustainability standards can generate opportunities for producers. Potential benefits include a more efficient use of resources, an improved reputation in international markets, facilitated entrance to more demanding markets, and better product differentiation. These aspects are important for Chilean agricultural producers, as the sector produces mostly commodities that compete with products from other countries.

However, stakeholders also presented challenges related to sustainability standards, such as the (sometimes prohibitively) high costs and lengthy processes of obtaining certain kinds of certification, and the administrative bureaucracy.

From an implementation point of view, concerns were mostly related to information and communication. For producers, it is often unclear where information about sustainability initiatives can be found. As discussed in section 4.2 and chapter 5, producers need to make an informed choice among the wide array of initiatives. What is complicating matters even more is the fact that the requirements, the method of assessing compliance, and several other characteristics can vary greatly depending on the market and the product.

The stakeholders agreed that consumers face a similar challenge, as they do not understand all the different logos and labels. As a result, they do not necessarily reward the most sustainable products. The literature review suggests that producers can obtain a price premium for their products, but Chilean producers do not yet see this effect, because consumers lack the necessary knowledge about sustainable products to be able to interpret the logos and labels. There is an important challenge for the different participants in the supply chain to improve consumers' knowledge, and to develop adequate awareness and marketing campaigns that can generate the positive results expected.

6.2 Conclusions and recommendations

From the analysis performed in this study, a number of conclusions can be drawn. Firstly, it can be concluded that a sustainability standard can be beneficial for Chile's agriculture exports. Secondly, the mere amount of initiatives to choose from in Chile and in the world represent a challenge for producers. Therefore, there is no need to "create" yet another one, but to build on and generate alliances with existing initiatives. Thirdly, producers (and later consumers) need to be provided with better information, in order to improve the sustainability of their performance, and allow them to eventually obtain certification. These three ideas will be developed in more detail next.

6.2.1 Sustainability standards are beneficial for Chilean exporters

In Chile, sustainability standards could create several opportunities, not only for producers and exporters, but also for society as a whole. Companies could obtain increased revenues, as well as access to new markets, higher yields and productivity, and a better reputation. There are social benefits as well, such as higher income generation for local communities, and the creation of new and higher-level jobs. Environmental benefits can also be expected, such as lower soil, water and biodiversity degradation.

On the other hand, there are also costs associated to the initiatives, such as administrative costs, investments in different technologies, certification fees, and others.

Performing a quantification of the different costs and benefits of such initiatives does not fall within the scope of this study. However, a guideline for this quantification of social, environmental and economic impacts of sustainability standards, which can be useful for further research, is presented in Annex 1. This guideline includes relevant information that was collected specifically for Chile.

6.2.2 Build on existing initiatives and cooperation

Several national initiatives have importantly contributed to the incorporation of sustainability issues into their industries, such as Chile G.A.P., the Sustainability Code of the Wine Industry, the CPAs, and ODEPA's Sustainable Agriculture Protocol. It is essential that a "new" initiative incorporates these actors into the decision-making process in order to bridge the gap between national and international standards. If national requirements coincide with the requirements in international markets, this would enhance the competitiveness of Chilean exports.

Additionally, the National Programme of Sustainable Consumption and Production (NPSCP) of the Ministry of Environment is in its initial stage of implementation. The Programme has 12 lines of action, including "information to consumers"; of which the national eco-labelling programme is an important element. One of the main goals is to set up a national programme that can be replicated for different sectors following common methodologies, in order to avoid confusion and put efforts and knowledge into one initiative. As previously mentioned, ODEPA is currently cooperating with CPL, CORFO and INDAP in developing Sustainable Production Agreements with a common methodology in order to encourage sustainable practices in the sector. ODEPA has actively participated in the development of the "information to consumers" line of action of the NPSCP, which is a good indicator of the homogeneity between instruments and institutions.

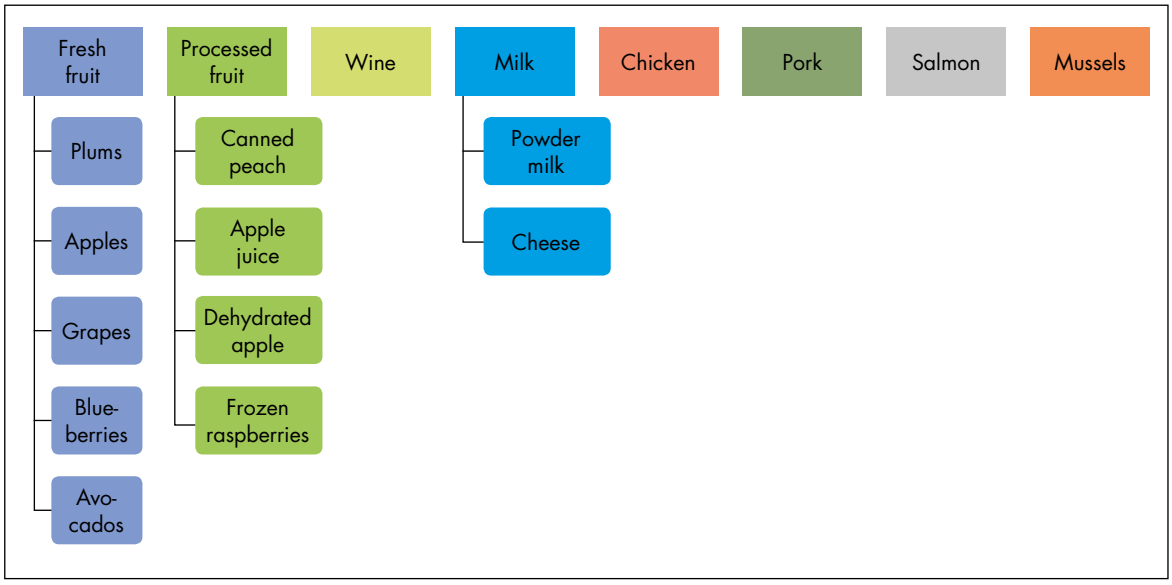
Adequate information about the state of Chile's agricultural sector is often lacking, especially regarding the environmental impact of different subsectors and agricultural products. The "Ecobase" project[12] aims to address this challenge through the creation of a technological platform, which will include environmental data about key agriculture export products, developed with life cycle analysis (LCA) methodology, in order to inform stakeholders' decisions regarding environmental issues.

12 Please see: http://www.consorcioporlasustentabilidad.cl/ecobase/

The Ecobase project contains 16 products, which are presented in Figure 33. For each of these products, the following elements will be developed: i) a life cycle assessment of the average Chilean product with the different environmental hotspots; ii) a calculator that will allow companies to include their own data to compare themselves to this average; and iii) guides of good practices associated to the hotspots, with suggestions on ways to improve environmental performance.

The information provided by Ecobase can be used as a baseline for some products, in order to evaluate the good practices that arise from a future sustainability standard and to improve producers' environmental performance.

Figure 33: Products in the Ecobase Food project



Source: Own elaboration with with information from Fundación Chile (n.d.)

6.2.3 Better information of producers and exporters

It is not only necessary to build on existing initiatives, but also to gather relevant information for different audiences. This can be through an online platform owned either by an NGO, a public organism, a private organization, or a combination of these. Useful data that such a platform could collect would include, for example:

- The existing national or international initiatives for each type of product;
- The most important initiatives for each product, considering criteria such as the amount of products/ production certified in Chile, around the world or for a specific destination market;
- Contact information of representatives in Chile for the different initiatives, or the contacts of companies that provide the certification;
- A compilation of available information regarding costs and benefits of certifications, which companies can use in order to persuade their relevant stakeholders;
- A summary of the most common requirements for specific products, in terms of water use, energy use, social protection, etc.;
- Sets of sustainable agricultural practices in order to start the preparation process.

The platform can also build on the work of others, such as Standards Map, the Ecolabel Index and others, like Sustainability Xchange[13] and the Global SCP Clearinghouse.[14] Xchange is a community-owned, interactive

13 www.sustainabilityxchange.info/
14 www.unep.org/resourceefficiency/Policy/SCPPoliciesandthe10YFP/The10YearFrameworkProgrammesonSCP/GlobalSCPClearinghouse/tabid/102573/Default.aspx

platform for sustainable supply value chain development. It includes a forum to share experiences, a library with training materials and capacity-building tools, reports and presentations, a newsroom, an events calendar, and a directory of experts and institutions. Global SCP Clearinghouse compiles news and calendars, and maintains an interactive map to identify sustainable consumption and production (SCP) initiatives around the world, whether they are implemented by governments, the business sector, civil society or other actors.

6.2.4 Sustainability standard for Chile's agricultural sector

Based on all the information presented throughout the study, the final recommendation is to implement a sustainability standard for Chile's agricultural sector. This standard should be aligned with national initiatives and be able to facilitate the homologation with the most relevant international sustainability standard for the specific product. This process of homologation will help to reduce the confusion among Chilean stakeholders caused by the large amount of initiatives worldwide, while also focusing time and resources towards one goal.

Such a standard would lead to new synergies between greening the economy and creating trade opportunities. The literature review and the experience of Chilean stakeholders, as compiled in this study, have identified the potential benefits from the adoption of a sustainability standard in terms of yield, reputation and access to new markets on the one hand, and a "greener" agriculture that is not only beneficial for the producers/exporters but also for society and the environment, on the other.

This sustainability standard for Chile's agricultural sector should have certain characteristics, which were presented in section 5. The standard should reward the best practices ("high bar" please see section 5.3.2) and be led by the private sector, but with strong support from the public sector (see section 5.3.3). It should be third-party verified (see section 5.3.4), focus on final results (see section 5.3.6), and be product-specific (see section 5.3.9), in order to give it enough credibility in international markets. Its requirements should focus mainly on environmental and social issues (see section 5.3.5), with critical criteria that producers need to comply with, but there should also be space for improvement through corrective actions, valuing intentionality (see section 5.3.7). Since the standard is oriented to primary and secondary agriculture, the standard needs to focus both on the production/extraction of the product and its conversion/processing (see section 5.3.10). The scope of the standard can be *standard-setting* and *certification*, or *standard-setting* and *framework-developing* (see section 5.3.8).

6.3 Further steps

More work is needed to encourage more producers and exporters in Chile's agricultural sector to adopt sustainability standards. The first and most relevant step is a pilot project that can test the findings of this study in the field, and provide technical capacity building to an industry to be selected, working through its industry associations, in order to enable the adoption of existing sustainability standards. Such a project would aim to improve knowledge of available standards (including on leading standards by industry and destination market), their market access potential, cost information, their specific requirements and compliance mechanisms, and the formalities and timeframes to become certified. The activities would include:

a. An initial workshop to identify the main needs in the industry;

b. The development of three custom-made training sessions, taking into consideration the objectives, profile and potential of each industry;

c. Create an online forum to exchange this information, with guidance documents, training documents, and information booklets to inform all interested producers within the industry, and to transmit this knowledge and capacity to other sectors and industries. It will also serve as a space for different actors to share experiences and getting in touch with companies that already have some form of certification, companies that are interested in getting certified, auditing companies that are active in third-party certification, etc.

d. Provide technical support for the certification of 3 producers in the chosen industry;

e. Host a final workshop to share the lessons learned of the certification process with other producers;

f. Produce and launch a manual for sustainability certification in the selected sector, that compiles the information developed and gathered throughout the project.

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8 Annex

8.1 Annex 1: Guideline to quantification of social, environmental and economic impacts of sustainability standards

Based on "A Guide for the Assessment of the Costs and Benefits of Sustainability Certification" developed by UNEP, this annex presents a short summary of the seven steps necessary to evaluate a sustainability standard. Additionally, the annex provides some specific information for the case of Chile.

Table 27: Key steps and actions to perform a sustainability related Cost Benefit Analysis

Steps	Actions
1. Explore your case and pose a research question	• Explore and choose relevant documents on the same topic. • Scan databases and make a first evaluation on the scope of data available. • Carefully ask what the purpose of the Cost–Benefit Analysis (CBA) is. Formulate a research question and make a first outline of the aspects the analysis should cover. Consider the following: Who is looking at the costs and benefits of a specific decision (consumers, companies, public officials?) What is the relevant time frame of the analysis and the research question?
2. Identify relevant indicators	• Identify indicators of investment. • Identify indicators of added benefits, economic, social and environmental. • Identify indicators of avoided costs, economic, social and environmental. • Analyze relevant case studies to better inform the indicators identification process.
3. Select indicators that are relevant and applicable to your specific sector	• Select indicators to assess the current level of compliance with certification requirements in the respective sector of analysis. • Select indicators of transition costs directly related to the sector context and current compliance level. • Select indicators of benefits directly related to the sector context, including indicators of trade benefits and sustainability gains. • Provide a brief justification of the choice of indicators.
4. Collect available data	• Collect sector-specific data from relevant sources at the national, regional and global level. This includes primary data, to be collected by means of questionnaires, interviews etc., as well as secondary data. • Collect data from international databases on global production, trade and consumption trends. • Collect data and relevant information from sector-specific case studies.
5. Classify data based on specific analytical needs	• Group data on investments needed to comply with specific certification requirements. • Group data on potential added benefits of shifting to sustainability certification. • Group data on potential avoided costs of adhering to sustainability certification.

Steps	Actions
6. Analyze the data, adopting an integrated and systemic approach	• Analyze the data and select the most suitable cost–benefit analysis technique (e.g., net present value, payback period, rate of return). • Carry out a cost–benefit analysis by comparing investments with added benefits and avoided costs. • Assess the results of different scenarios, adopting a systemic perspective. • Compare the outcome of different scenarios (e.g. outcome of one or more investment scenarios against a business-as-usual (i.e. "no action") scenario).
7. Evaluate CBA results and inform the decision-making process	• Evaluate the results of the analysis through a multi-stakeholder process. • Outline potential impacts of certification across actors, in the sector that is being analyzed. • Evaluate the overall profitability of adhering to the selected certification scheme (including economic, social and environmental gains).

Source: UNEP, 2015

8.1.1 Step 1: Explore your case and pose a research question

After getting acquainted with the case by exploring existing data and studies on the same or similar topics, it is essential to have a clear research question, measuring/comparing against a business-as-usual situation and/or between different certification investment scenarios. In the case of Chile, both options are valid, since companies that do not have any certification (business as usual) can assess the scenario of adhering to one, while companies that have a certification can assess the scenario of adhering to another. The characteristics of these initiatives, as presented in section 5 (for instance high bar or entry level, self or third-party verification, etc.) can affect the cost and benefits perceived by different stakeholders.

Although this guide mostly focuses on cost–benefit analysis, there are other methodologies to assess the impact of sustainability standards. Therefore, it should also be assessed which methodology is most suitable for the situation. Some options will be presented below.

The International Association for Impact Assessment defines impact assessment as "the process of identifying future consequences of a current or proposed action" (Wass et al., 2014). The purpose of sustainability assessment is to provide decision-makers with an evaluation of integrated nature–society systems in short and long term perspectives and on the global and the local level, in order to assist them to determine which actions should or should not be taken in an attempt to make society sustainable (Ness et al., 2007).

The development of indicators in various fields, such as economic development, social progress, quality of life, environmental and natural resources, healthy communities and sustainability, have significantly influenced the methodologies to assess the degree of sustainability. Some of the most employed methodologies to evaluate impacts are Cost–Benefit Analysis, Cost-Effectiveness Analysis and Sustainability Return on investment (Kolstad, 2010; Earth Shift, 2012; Adler, 2013). A basic summary of these methodologies will be presented next.

8.1.1.1 Cost–Benefit Analysis

This methodology is considered a monetary-based technique (Department for Communities and Local Government, 2009). The main objective is to establish whether benefits outnumber costs of the project in economic terms (Ministerio de Planificación, 2011). It is used for evaluation of public or private investment proposals by weighing the costs of the project against the expected benefits (Ness et al., 2007). To achieve this purpose, it is necessary to identify, quantify and monetize benefits and costs associated with a project (Dhaliwal et al., 2012).

The first step for a cost–benefit analysis is the definition of a project and its objective. The next step is to identify its main physical impacts (Hanley and Barbier, 2009), which is to recognize main costs and benefits. On one hand, the costs can include information about expenses and losses in the design, implementation, execution and operation of the project (Ministerio de Planificación, 2011). On the other hand, the benefits have to be identified. When these are social and environmental benefits, the process becomes more challenging (Ministerio de Medio Ambiente, 2013), because these benefits are more difficult to quantify and monetize, which makes the use of assumptions or estimates necessary. For example, in health projects, one possible

solution is to estimate an economic value for medical treatment or days without work (Ministerio de Medio Ambiente, 2013). Another option is to value the impacts in terms of their marginal social cost or benefits (Hanley and Barbier, 2009).

Once costs and benefits are valued to the present (Cost Present Value, CPV and Benefit Present Value, BPV) it is possible to calculate the Net Present Value, which allows us to determine the viability of the project. If NPV is positive, the project can be accepted (Kolstad, 2010) because its benefits will be greater than its costs. If the opposite, NPV is negative, it is not recommended to do a project (although it does not necessarily means that the project is not attractive financially, since some of the cost and benefits are monetized but do not imply money expenditure). Before the study is finished, it is recommended to do a sensitivity analysis for a range of results.

8.1.1.2 Cost-Effectiveness Analysis

Cost-Effectiveness Analysis is another monetary technique (Department for Communities and Local Government, 2009). The main objective of this methodology is to identify the alternative that generates the lowest cost to obtain the same benefits as other alternatives (Ministerio de Planificación, 2011). That is to say, this methodology determines which project, among a list of others projects, will achieve the purpose with the lowest cost. Generally, this methodology is recommended when the process of determining a monetary value for a project's benefit is difficult.

After gathering the necessary information about costs and benefits of each project, two parameters have to be calculated: Cost/Effectiveness (CE) and Effectiveness/Cost (EC) (Equation 1). These allow for an estimation of which project generates the benefit at the lowest cost. CE is measured in monetary units by effectiveness units (Riegg and Edwin, 2010), for example a dollar for each unity of CO_2 emissions reduced. EC is measured in terms of effectiveness units by monetary units.

$$CE = \frac{\text{Cost Present Value}}{\text{Benefits}} \quad ; \quad EC = \frac{\text{Benefits}}{\text{Cost Present Value}}$$

The project with the lowest CE and highest EC will be considered the most convenient to carry out (Kolstad, 2010). However, a certain caution is necessary when interpreting the results, as the method does not take the magnitude of different projects into account. This is why this methodology is recommendable only for projects of similar size (Riegg and Edwin, 2010).

8.1.1.3 Sustainability return on investment

Integrating sustainability into core business activities can generate a positive return on investment, and contribute to the socioeconomic and environmental framework conditions necessary for the growth and success of operations (UNEP, 2012a). With this in mind, the objective of this methodology is to determine whether an initiative is viably sustainable or not, considering the three different areas that are affected: economic, social and environmental. In order to do this, this methodology considers all the cost and benefits of the stakeholders involved in a project, in order to make the results easily understandable. It also incorporates intangible costs and benefits and uncertainty, which is the reason the results include different scenarios and probabilities of occurrence (Earth Shift, 2012). With this methodology, the evaluator will have access to all the necessary information to make a decision in a complex situation, which allows minimizing the risk and maximizing the return on investment (Gangemi and Laurin, 2012).

This tool gives the necessary information to support projects that do not seem to be feasible from a regular return on investment perspective, but which are the correct choice because of other more intangible benefits, for example to reduce the emission of a contaminant to the atmosphere, or to improve the health of a certain community (Earth Shift, 2012).

After going through the main characteristics of different evaluation methods, Table 28 presents the advantages and disadvantages of the different options.

Table 28: Advantages and disadvantages of each of the methodologies discussed

	Cost–Benefit Analysis	Cost-Effectiveness Analysis	Sustainability returns on investment
Advantages	• It measures costs and benefits in the same, generally monetary, units. • It allows to aggregate or eliminate costs or benefits in an easy way, and to study different stages. • It determines which action or project is the most beneficial alternative for the society, also against the status quo. • It can incorporate uncertainty or not. • It is a transparent methodology for choosing the best project.	• It is not necessary to monetize benefits, it just needs monetized cost. • The evaluator chooses the unit to measure benefits. It eliminates the subjectivity of only using monetary values. • The environmental benefits are included. • It allows the evaluator to decide when only limited information is available.	• It takes environmental, social and economic aspect of a project into consideration. • It includes uncertainty of each cost and benefit. • It gives results for different stages, with its probabilities. • All stakeholders are involved, estimating its costs and benefits. • It promotes interaction and transparency between stakeholders.
Disadvantages	• In case the monetary value of benefits is unknown, an estimation needs to be performed, which gives uncertainty to the analysis. • If benefits and costs are generated in different periods of time, it is necessary to use a discount rate. Although market discount rates are usually adequate, they might be less appropriate for the analysis of social and environmental impacts. • It is common to ignore some benefits, if they are difficult to monetize. • A cost–benefit analysis does generally not take the interactions between different impacts into account. • It is possible that the analysis does not consider all stakeholders involved.	• It is necessary to clearly identify the consequences of a project to its environment, and these should be easily quantified. • In those situations when costs are generated in different periods of time, a discount rate needs to be defined. Although market discount rates are usually adequate, they might be less appropriate for the analysis of social and environmental impacts. • The analysis focuses on the main results of a project, omitting those least relevant, based on the judgment of the evaluator. • A cost-effectiveness analysis is only recommended for projects of similar size.	• It is necessary to involve everyone who will be affected by a project. This is time-consuming and expensive. • It is likely that several iterations need to be done if new information is received from different stakeholders.

Source: Own elaboration based on Kolstad (2010) and European Commission (2014)

8.1.2 Step 2: Identify relevant indicators

Sustainability standards have several environmental, social and economic impacts. They broaden markets, improve the image and credibility of companies, provide access to information and technical assistance, increase efficiency and support local economies. There are some costs associated to sustainability standards as well, for example cost of audits or any investment necessary to achieve the requirements.

Please refer to sections 4.3 and 4.4 to identify different costs, benefits and avoided costs of sustainability standards.

8.1.3 Step 3: Select indicators relevant and applicable to your specific sector case

The objective of this step is to narrow down the set of identified indicators in order to tailor it to the specific sector, certification programme and context analyzed, as well as to account for progress already made in greening production.

It is important to know whether Chilean agriculture producers already comply with sustainability principles, criteria and standards (Case A); or whether additional interventions are needed to transform production and trade to make them comply with requirements (Case B). Given the information provided in section 4.3.2 about state of the sector, Case B seems to be the most likely scenario, since producers and exporters appear to be far behind in terms of sustainability.

Table 29 presents a checklist for the choice of useful indicators.

Table 29: Checklist for the choice of indicators for sustainability certification CBA

Type of indicator	Checklist
General	The indicator is relevant for the specific case analysed, as it can contribute to the estimation of costs and benefits of sustainability certification.
	The indicator is based on the best available science and used in other relevant studies and publications.
	The indicator is measurable at a reasonable cost.
	The indicator can be measured across time, and used for comparison across different spatial contexts.
	The indicator can be easily used for communication with the intended audience.
	The set of indicators chosen for the CBA are covering broad economic, social and environmental aspects of sustainability certification.
	All selected indicators are expressed in monetary terms and can be summed up and compared for analytical purposes.
Investment indicators	Upfront investments for the shift to sustainability certification are quantified (e.g. infrastructure development, upfront certification costs, purchase of machinery).
	Periodic costs of certification are measured through indicators (e.g. registration and certification fees, costs of periodic inspections).
	Investments for gaining access to new markets (e.g. enlargement of distribution network) are accounted for.
	Training costs on sustainable production and trade methods and techniques are estimated.
	Public subsidies or other incentives that would reduce private investments are considered in the analysis.

Type of indicator	Checklist
Added benefits indicators	Indicators of added benefits related to production/processing of certified products are considered (e.g. higher productivity).
	Indicators of added benefits related to trade are considered (e.g. higher sales and profits, premium price).
	Indicators of social added benefits are considered (e.g. higher employment and salaries).
	Indicators of environmental added benefits are considered (e.g., higher value of natural resources).
Avoided costs indicators	Indicators of avoided costs from improved resource efficiency are estimated (e.g., reduced amount and cost of inputs to production, such as water).
	Indicators of avoided social costs are integrated in the analysis (e.g., reduced costs of sanitary assistance to employees due to reduced air pollution).
	Indicators of avoided environmental costs are integrated in the analysis (e.g., reduced costs of water purification).

Source: Own elaboration with information from UNEP (2015)

8.1.4 Step 4: Collect available data

Sources of information include case studies, reports, and stakeholder interviews. Additional data sources, ranging from surveys to national databases, should also be consulted. Field data should always be prioritized and, whenever possible, directly obtained from the producers (or industry representatives/associations) that are interested in exploring sustainability certification.

International databases also include:

- OECD industry and trade statistics.
- World Bank's World Development Indicators (WDI).
- Eurostat databases on industry and trade trends.
- WHO's International Trade Statistics.
- Trade statistics (including specific tools such as the Standards Map, focused on sustainability certification trends at the global level).

When no country-specific data is available, case studies from similar country contexts and sectors can be consulted. If only an insufficient amount of data can be found, returning to Step 3 might be necessary in order to select an alternative indicator that has enough data availability.

8.1.5 Step 5: Classify data based on specific analytical needs

Once all the data is available, the information needs to be categorized in a way that facilitates the implementation of a sustainability-inclusive CBA. According to the previous classifications, the information should be organized as follows:

a. Group data on the investments that are needed in order to comply with specific certification requirements. Data categories under this group may include: (1) Capital and Operation & Management costs; (2) Training costs; (3) Certification costs; (4) Government costs.

b. Group data on potential added benefits of shifting to sustainability certification. Data categories under this group should include: (1) Direct and indirect economic benefits; (2) Direct and indirect social benefits; (3) Direct and indirect environmental benefits.

c. Group data on potential avoided costs of adhering to sustainability certification. Data categories under

this group should include: (1) Direct and indirect economic avoided costs; (2) Direct and indirect social avoided costs; (3) Direct and indirect environmental avoided costs.

8.1.6 Step 6: Analyze the data adopting an integrated and systemic approach

The objective of this step is to plug categorized data into the indicator framework in order to conduct the assessment of costs and benefits of sustainability certification.

Firstly, the most suitable cost–benefit analysis technique needs to be selected. Depending on the research question, the data available, and the specific sector addressed, a choice among several techniques can be made, including net present value, payback period, rate of return, and others.

Then the cost–benefit analysis is carried out, summing up the costs of sustainability certification and comparing them with the sum of added benefits and avoided costs that can be potentially derived from certification programmes. To address the uncertainties of the assessment, several scenarios can be created, especially with those variables that are most likely to change or for which the source of information is not optimal.

8.1.7 Step 7: Evaluate CBA results and inform the decision-making process

When an adequate CBA analysis has been performed, the outcomes need to be taken into consideration in public and private decision-making processes. Therefore, the next step should be to map stakeholders and generate instances of dialogue with them. Table 30 presents a list of potential relevant stakeholders. Table 31 presents different techniques to engage them.

Table 30: Relevant stakeholder to engage

Broad stakeholders category
Producers
Capacity-building organizations
Traders and trade association
Retailers
Consumer movements
Trade unions
Social NGOs
Indigenous groups
Government, local authorities
International organizations
Financial institutions
Researchers and academic bodies
Sustainability information providers
Certification bodies
Other standard setters

Source: Own elaboration with information from ISEAL Alliance (2013)

Table 31: Strategies for stakeholder engagement

Technique	Description	Advantages	Disadvantages
Publications	Announcement in regular newsletters or periodicals	Reaches core stakeholders	Not an input mechanism; combine with other techniques
Comment Forms	Traditional format for comment submission	Structured format, widely accessible	Low incentive to respond; not interactive
Website posting	Prominent placement on website	Reaches everyone, including those not known to you	Stakeholders have to be driven to the website
Workshops	Regional or issue-based workshops with key stakeholders	Ensures certain groups are targeted; in-depth feedback	Costly; limited numbers
Conferences	Discussion among meeting participants	Reaches core stakeholders; in-depth discussion	Costly; may limit disadvantaged stakeholders
Pilot testing	Field tests	Practical assessment of usefulness; in-depth feedback	Results may not be more broadly applicable
Surveys	Questionnaires, online or paper	Structured responses; high response rate for online versions	Answers potentially restricted by format
Interviews	In-depth survey	Potential for discussion, flexibility	Limited numbers
Internal discussions	Social media and interactive tools	Cheap and flexible formats	Requires technological awareness and access

Source: Own elaboration with information from ISEAL Alliance (2013)

8.1.8 Available information for the evaluation of a sustainability standard for the Chilean agriculture

Table 32 presents different sources of information that could be useful for an assessment of costs and benefits of a sustainability standard for Chile's agricultural export. Most of these are not specific for the country, but international sources that can somehow be adapted to the Chilean reality.

A relevant source of information is "MAPS-Chile: Mitigation Options for Addressing Climate Change" (INFOR-INIA and MAPS-Chile, 2014), developed by the Chilean government, which has a specific report about agriculture, livestock, forestry and land change with measures that can be useful for a study of these characteristics. For example, they evaluate impacts like:

- Use of renewable energy for irrigation
- Alternative tillage measures
- Use of fertilizers with inhibiters of the nitrogen cycle
- Incorporating organic matter into the soil

Another important source of information is DICTUC (2013), a study carried out for the CPL, which describes the costs and benefits ex-ante of the CPAs in Chile. This study contains information about the costs of the initiatives, and about impacts related to water use, air quality, solid waste and energy use that can be useful for further research.

Lastly, the Reforma Tributaria is worth mentioning. With this initiative, the Chilean government has created a tax for companies to pay for their emissions of GHG, PM, SO2, and NOx. Although the calculated cost is not very high (for example, the cost of CO_2 emissions is at US$5/ton), it is an important step forward for companies to internalize the externalities of their operations.

Table 32: Available information for an assessment of costs and benefits in Chile´s agricultural sector

Type of information	Source	Available information
General assumptions	European Commission (2014)	Time frame for different type of projects of similar characteristics
	Ministerio de Desarrollo Social (2015)	Current social discount rate
Avoided costs	INFOR-INIA and MAPS-Chile (2014)	Land use and projections for agriculture
		Direct GHG emissions of different agriculture sectors
	Pretty et al. (2000)	Cost of erosion
	Ministerio de Hacienda (2014)	Cost of externalities: GHG, PM, SO_2, NO_x
	OECD statistical database; Bengoa et al. (2014); Weidema et al. (2013).	Emissions due to the use of diesel for irrigation (CO_2, PM, SO_2 and NO_x)
Added benefits	Ministerio del Medio Ambiente (2011)	Estimated business-as-usual jobs in agriculture
	Herren et al. (2012)	Increase in the amount of employees
	Rainforest Alliance (2012); Fortín et al. (2010)	Higher yield for producers/exporters
Investment & operating costs	Rainforest Alliance (n.d.)	Private costs for producers/exporters, such as capital and operation & management cost; training costs; and certification costs
	DICTUC (2013)	Public cost incurred by the government to develop this initiative

Source: Own elaboration

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