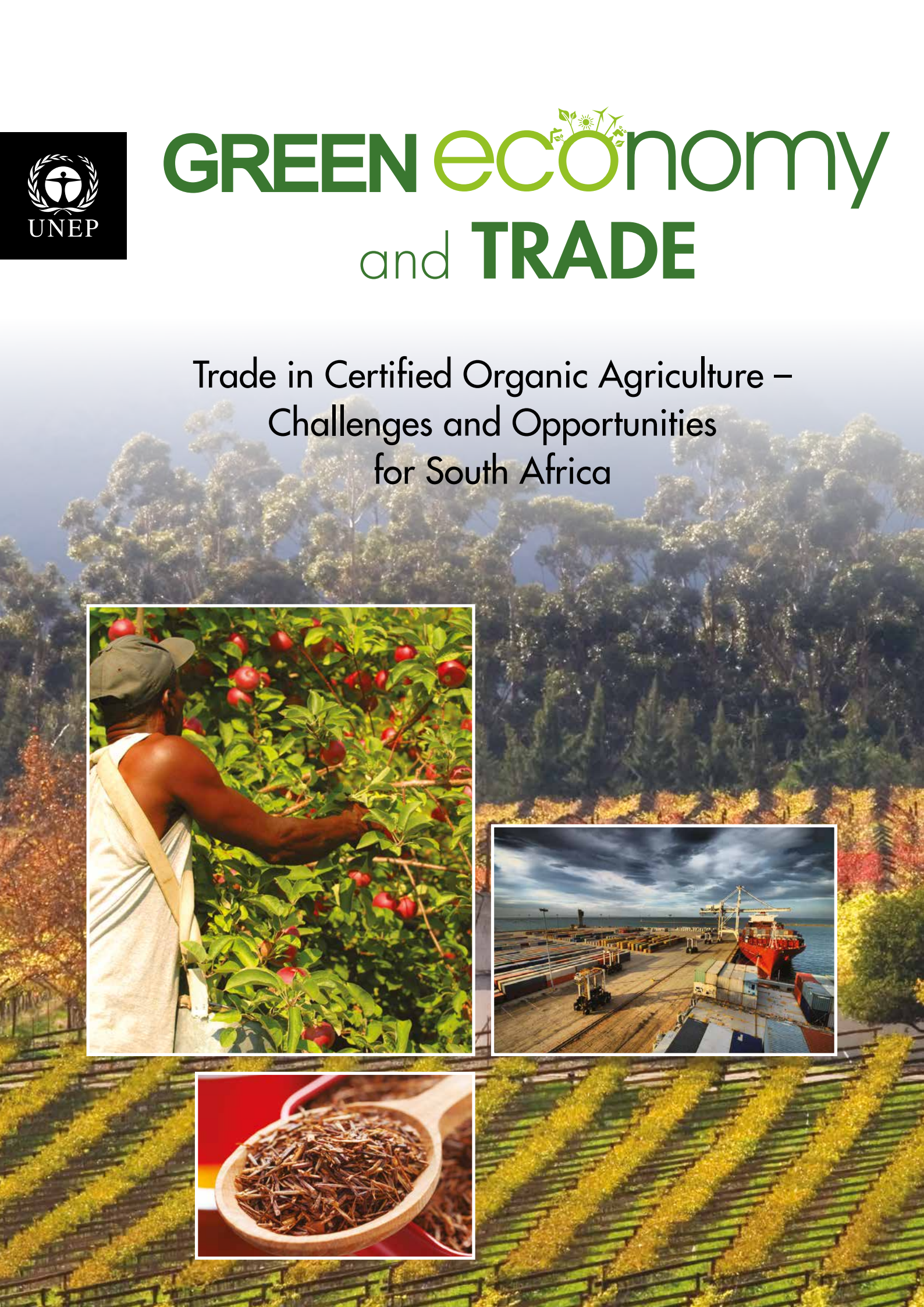




GREEN ^{economy} and TRADE

Trade in Certified Organic Agriculture –
Challenges and Opportunities
for South Africa



Citation

UNEP (2016). *Trade in Certified Organic Agriculture – Challenges and Opportunities for South Africa*. Geneva: UNEP.

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Acknowledgements

The study about the export of certified organic agriculture from South Africa was commissioned by the United Nations Environment Programme (UNEP), as represented by its Trade, Policy and Planning Unit of the Economy and Trade Branch (ETB).

The overall development and content of this study was managed by Lennart Kuntze, under the general supervision of Anja von Moltke, Head Trade, Policy and Planning Unit. Katharina Schmidt contributed to the initial idea and concept of the study. Alexandra Galef and Simon Lobach reviewed the study and provided comments. Special thanks go out to Cecilia Kinuthia-Njenga (UNEP Office South Africa).

Authors: This study was authored by the trade law centre NPC (tralac), as represented by Trudi Hartzenberg, Willemien Viljoen and Armin Roggendorf.

Overall, the study identified and liaised with more than 300 direct stakeholders (individuals & organisations) with an interest in the furtherance of organic agricultural practices in South Africa. Special thanks go out to Thembelihle Ndukwana, Gordon Gleimius and Luke Govender (Department of Trade and Industry of South Africa); Devina Naidoo (Department of Environmental Affairs of South Africa); Kgomo Petje and Niel Erasmus (Department of Agriculture, Forestry and Fisheries of South Africa); Sarel van Wyk (The Perishable Export Control Board); Konrad Hauptfleisch (International Federation of Organic Agriculture Movements – Organics International); Marianna Smith (Ecocert); Werner Euler (Control Union); Tobias Fischer (BCS Oeko Garantie); Arne Schuffenhauer (Naturland); Sönke Hobbensiefken (Ceres Certification); Arianna Baldo (Fair Trade Label); Lisa Ryser (UTZ Certified); Diana Callear (Afrisco); Liesl Haasbroek (Biodynamic Association of South Africa); Jonas Spahn and Ralph Langholz (Switzerland Global Enterprise); Anton Kruger (Fresh Produce Export Control Board); Anton Rabe (Hortgro); Anri Landman, Kenneth Carden and Scott Drimie (South African Food Lab); Luke Metelerkamp (Sustainability Institute); Alan Rosenberg (South African Organic Sector Organisation); Raphael Schilling (Coop Switzerland); Jens Juul Nielsen (Coop Denmark); Christian Jürgs (Hälssen & Lyon); Mignon Ortlepp (Lehmann Natur); Inka Sachse (Soil & More); Sara Norell and Johan Larsson (Systembolaget), and many passionate organic farmers in South Africa.

Reviewers: Konrad Hauptfleisch (IFOAM – Organics International); Lennart Kuntze, Alexandra Galef and Simon Lobach (UNEP); Devina Naidoo (Department of Environmental Affairs of South Africa); Gunnar Rundgren (Grolink) and Marianna Smith (Ecocert).

Special thanks:

UNEP and the authors would like to thank the European Commission for the financial support provided by the EU to the Green Economy and Trade Opportunities Project.

List of acronyms

ACMA	Australian Communications and Media Authority
AfDB	African Development Bank
AFRICEGE	African Centre for a Green Economy
AgriSETA	Agricultural Sector Education and Training Authority
AMI	Agricultural Market Information Company
APAP	Agricultural Policy Action Plan
AU	African Union
BRICS	Brazil, Russia, India, China and South Africa
BWI	Biodiversity and Wine Initiative
CAP	Common Agricultural Policy of the EU
CBA	Cost–Benefit Analysis
CBTF	The UNEP–UNCTAD Capacity Building Task Force on Trade, Environment and Development
CCC	Confronting Climate Change
COROS	Common Objectives and Requirements of Organic Standards
CSA	Climate-Smart Agriculture
CSIR	Council for Scientific and Industrial Research
CSP	Country Strategy Paper
DAFF	The Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEFRA	Department for Environment, Food and Rural Affairs
DTI	The Department of Trade and Industry
DWS	Department of Water and Sanitation
EAOS	East African Organic Products Standard
EASAC	European Academies Science Advisory Council
EC	European Commission
EEA	The European Economic Area
EFTA	The European Free Trade Association
EMIA	Export Marketing and Investment Assistance Scheme
EPA	Economic Partnership Agreement
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FFF	Farming for the Future
FiBL	Forschungsinstitut für Biologischen Landbau (Research Institute for Organic Agriculture)
FRIDGE	Fund for Research into Industrial Development, Growth and Equity
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GE-TOP	Green Economy and Trade Opportunities Project
GHG	Greenhouse Gas
GlobalGAP	Global Good Agricultural Practices certification
HACCP	Hazard Analysis and Critical Points
HS	Harmonised System
IAF	International Accreditation Forum
ICROFS	International Centre for Research in Organic Food Systems
IDWG/OA	Inter-Departmental Working Group on Organic Agriculture
IFOAM	International Federation of Organic Agriculture Movements (today: IFOAM Organics International)
IFS	International Food Standard

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ILO	International Labour Organization
INR	Institute of Natural Resources
IPAP	Industrial Policy Action Plan
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
ITC	International Trade Centre
IUCN	International Union for the Conservation of Nature
Kg	Kilogram
KWh	Kilowatt hour
MEA	Millennium Ecosystem Assessment
NCCRS	National Climate Change Response Strategy
NDP	National Development Plan
NEDP	National Exporter Development Programme
NPC	National Planning Commission
NPV	Net Present Value
NSSD	National Strategy for Sustainable Development
OFRP	Organic Farmer Retailer Programme
PGS	Participatory Guarantee System
SA8000	Social Accountability 8000
SABS	South African Bureau of Standards
SACN	South African Cities Network
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAHTA	South African Honeybush Tea Association
SAIGA	South African Local Government Association
SANAS	South African National Accreditation System
SANS	South African National Standards
SAOSO	South African Organic Sector Organisation
SARC	South African Rooibos Council
SARS	South African Revenue Service
SAWIS	South African Wine Industry Information and Systems
SME	Small and Medium Enterprise
SPS	Agreement on Sanitary and Phytosanitary Measures
TBT	Technical Barrier to Trade
TDCA	Trade, Development and Cooperation Agreement
T-FTA	Trilateral Free Trade Agreement
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNIDO	United Nations Industrial Development Organization
USA	United States of America
US\$	United States Dollar
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
WWF	World Wildlife Fund
ZAR	South African Rand

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Executive Summary

Worldwide, there is a growing recognition that organic agriculture has the potential to play a significant role in addressing food insecurity, land degradation, poverty, and climate change. Consumers are increasingly aware of the food they consume, and technology allows them to constantly access the latest process and product information: this changes the ways business is done and provides a window to change the agricultural sector.

South Africa currently has 37,466 hectares of organic agricultural land. In 2013, South Africa only produced organic agricultural products on 0.04 per cent of all land used for agricultural purposes. The development potential for organic farming in South Africa is enormous, but several key barriers prevent farmers from capturing this market opportunity. Firstly, knowledge about farms and farm management is necessary to expand the production of organic crops. Secondly, an increased understanding of local and international markets is necessary to perceive and satisfy increasing consumer demands for organic products. Moreover, a particular operation skillset is necessary to meet the requirements of eco-labels and certification schemes.

Trade agreements are negotiated and concluded at the policy level, with the aim to facilitate trade. South Africa has beneficial trade agreements with the EU and EFTA regions. However, non-tariff barriers, such as local content requirements and differing industrial standards and certification requirements, can hinder trade in environmental goods and the transfer of technologies, including for sustainable agricultural practices. While certification requirements can be perceived as a barrier to trade, certification can also lead to various benefits, including preferential market access. However, the complexity of the regulatory framework and the processes of certification and verification constrains the ability of farmers (especially small- and medium-sized) to adopt certifiable organic farming practices.

Despite these constraints, it is also evident that South Africa can reap many benefits from the production and export of organic products. Examples include increased revenue; a reversal of the mechanisation of farm activities and labour drain from rural areas; value addition and employment opportunities from on-farm processing, marketing and retailing; improved health for workers and consumers; increased food production; and the preservation of natural ecosystems. However, the initial costs associated with the conversion to organic agricultural practices need to be mitigated, including the reallocation of resources and the need for sophisticated market intelligence.

Organic agriculture in South Africa faces many challenges, including a lack of effective institutional representation and organic legislation / standards; a discord between production, certification and markets; and the need for a critical mass to justify capital investment and processes. To be able to fully harness the benefits associated with organic agriculture, the active engagement of numerous stakeholders is required. The potential ways in which the farming systems can counter environmental degradation need to be underpinned by robust and systematic assessments.

In this context, South Africa requires a national organic regulation or standard that defines the legally enforceable definitions of organic production. In the absence of an organic standard, any producer is allowed to market products as organic, which distorts public perception about what organic production entails. The adoption of an organic standard would facilitate the strengthening of capacities among organic farming cooperatives, the incentives for organic production, the conversion to organic farming systems, the development of a domestic organic market, and access to export markets.



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1 Introduction

1.1 Background, aims, and significance of the study

Despite its relatively small share of 1.9 per cent in total Gross Domestic Product (GDP), agriculture is an important sector of the South African economy, and it remains a significant provider of employment, especially in rural areas, and overall a major earner of foreign exchange. According to the International Trade Centre (ITC, 2014), South Africa is self-sufficient in virtually all the main agricultural products, and in normal years, South Africa is a net food exporter. The estimated value of agriculture product imports for 2012/13 amounted to ZAR 54,778 million, an increase of 12.3 per cent compared to the previous year, while the value of exports grew by 16.4 per cent, to ZAR 62,750 million. A shift towards more sustainable, organic production could make agricultural exports a major driver for a green economy transition in South Africa.

“Organic” farming is a holistic production management system that relies on ecological processes, rather than on the use of synthetic inputs with adverse effects. It minimises pollution of air, soil and water, and optimises the health and productivity of interdependent communities of plants, animals and people. Organic farming combines tradition, innovation and science to benefit the shared environment and to promote fair relationships and a good quality of life for all involved.

Organic products require certification. Certified products are distinguished by an organic label, which can be obtained through certification by a neutral third party, or through a participatory guarantee system (IDWG/OA, 2007).

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As per the Norms of the International Federation of Organic Agriculture Movements (IFOAM, called IFOAM Organics International since 2015), the four interdependent principles of organic agriculture can be described as:

- **Health:** organic agriculture should “sustain and enhance the health of soil, plant, animal and human and planet as one and indivisible.”
- **Ecology:** organic agriculture should “be based on living ecological systems and cycles, work with them, emulate them and help sustain them.”
- **Fairness:** organic agriculture should be “built upon relationships that ensure fairness with regard to the common environment and life opportunities.”
- **Care:** organic agriculture should be “managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment” (IFOAM, 2014b).

The production and export of organic products are economically appealing, as growth in international organic markets remains steady. In 2013, the global organic food market reached a financial volume of US\$ 72 billion, which is almost four times the amount of 1999. In 2016, the global organic food market is forecasted to have a value of US\$ 102.5 billion, an increase of 52.6 per cent since 2011, with the main export markets – Europe and the United States of America (USA) – accounting for about 90 per cent of market share (Willer and Lernoud, 2014; Willer and Lernoud, 2015).

South Africa has had an organic sector for many years, but it is still in its developmental phase and lacks public awareness. The sector comprises approximately 250 producers, 172 processors and 37,466 hectares of organic land, which account for 0.04 per cent of the country’s total agricultural area (Willer and Lernoud, 2015). The leading segments in the global organic market are fruit and vegetables, and South Africa especially offers fresh out-of-season products to its main export markets. This opens up significant sustainable trade opportunities.

The government of South Africa has recognised the potential of agriculture as a green economy sector, including under the Green Economy Accord, the National Strategy for Sustainable Development, and the Industrial Policy Action Plan (IPAP). The Green Economy Accord serves as social pact between governments, labour unions, private sector and civil society, and aims to advance the country’s New Growth Path and to create 300,000 new green jobs by 2020. The IPAP 2012 suggests that 20,000 jobs could be created through key action programmes over five years in the primary agriculture and agro-processing stages of the value chain. Following the Green Economy Strategy Summit in May 2010 and the adoption of the Green Economy Accord in 2011, the government established an inter-departmental working group to coordinate the national Green Economy transition. At the Green Economy Summit in 2010, President Zuma declared: “We have no choice but to develop a green economy” (Presidency of South Africa, 2010).

It is anticipated that South Africa has not yet leveraged its full potential for organic production and export, furthering the shift to a green economy. Part of the reason is that reliable data on trade in organic products is not readily available, leading to inaccurate estimates of the amount of certified organic farmers and products grown in South Africa. This may hamper implementation of effective export strategies. Further, in the absence of a domestic organic standard, any producer is allowed to market products as organic, which distorts public perception about what organic agriculture entails. Gaining a better understanding of these challenges is necessary in order to implement a shift to a greener economy.

The overall objective of this country study for South Africa, prepared under the Green Economy and Trade Opportunities Project (GE-TOP), is to assess sustainable trade opportunities arising from a shift to organic farming in the agricultural and agro-processing sector. Supporting this broad objective, the GE-TOP South Africa country study has the following specific objectives:

- To analyse the contribution of the organic agriculture segment as a driver of sustainable trade, economic growth, meaningful employment creation, and environmentally friendly production practices;
- To analyse and evaluate the contribution of relevant organic and food safety regulations and sustainability standards towards international trade and the greening of the economy;

- To assess the challenges and opportunities of sustainability standards and certification as a means to access international markets with a focus on the European Union (EU) and European Free Trade Association (EFTA) region, especially for wine, fruit (grapes, apples, pears, citrus) and herbs (Rooibos, Honeybush);
- To identify knowledge and capacity gaps amongst relevant national stakeholders regarding the challenges and opportunities for the uptake of and compliance with sustainability standards and certification in the agricultural sector;
- To assess the costs and benefits of a shift to organic farming practices and the export of organic produce, through the modelling of relevant indicators; and
- To undertake a trade analysis, identifying and proposing policy and industry recommendations in order to shape the enabling environment for increased organic and agro-processing sector investments, exports and capacity-building initiatives.

1.2 Study layout/scope of research

The study contains a total of six Chapters. This introduction (Chapter 1) outlines the national context, as well as the principal research aims and objectives of this study. Then, the available literature is presented, along with some conceptual considerations.

Chapter 2 presents the rationale for a shift to a greener economy on the global as well as the national level. It discusses the past and current efforts of UNEP in this regard, especially through GE-TOP. This chapter introduces the GE-TOP South Africa country study and describes trade opportunities that may arise through compliance with certification and the labelling of agricultural products. Moreover, it elaborates on sustainable trade aspects in agriculture, and discusses economic, social and environmental aspects. Lastly, the chapter explains why a dual market development approach is required to materialise sustainable trade opportunities in South Africa's agricultural sector.

Chapter 3 provides an overview of the agricultural sector in South Africa, using key trade data for selected product categories. The focus lies on certified organic products, in order to put them into an international and regional perspective. The product categories of interest are evaluated in terms of trade opportunities.

Chapter 4 describes the regulatory environment of certification and food labelling. It aims to provide a holistic overview, explaining organic certification along with international challenges, harmonisation and equivalence of standards. This chapter further investigates whether standards and labels are a mandatory requirement for both retail channels and consumers, and whether they indeed provide an effective tool for building consumer trust.

Chapter 5 discusses the most relevant literature about the social, economic and environmental aspects of sustainable farming practices in more detail. In light of the continued demand for organic products globally, this chapter assesses the opportunities for the development of export markets with a focus on the EU and EFTA region, while including the need for domestic market development and employment creation in South Africa. The latter may be stimulated through product innovation, standard compliance, trademarks, and protected geographical indications. From a social perspective, the chapter investigates the contribution of organic produce to the food supply chain, as well as health aspects of organic and sustainable production methods. Organic farming is often claimed to be a knowledge-intensive production method. The required skills are examined with a view to community development and social uplifting in South Africa. Further, organic farming is often described as the most sustainable approach in food production, as it emphasises recycling techniques and strategies to lower external inputs in order to enhance soil fertility and biodiversity. These aspects are evaluated in a global context, with a focus on opportunities for South Africa. The chapter concludes with a framework for a cost-benefit analysis for organic production, which can inform producers' decision to move into organic practice and export.

Chapter 6 draws conclusions and provides policy recommendations for the development of the sector on the basis of the results from the study. It further gives an outlook for expansion through a common agricultural policy within the regional economic schemes of which South Africa is a member.

1.3 Research methodology

The methodology for this study is based on a literature review and case content analysis. The primary sources of information are legal texts and regulations, trade information and statistics, to evaluate the status of organic production and exports. As no detailed, accurate data about organic farming is available in South Africa, the extent of the literature review depends on the nature of the sections.

The study carries out a cost–benefit analysis for organic production and export. While it is based on the assignment of a monetary value to all the activities performed, different techniques are commonly used to evaluate the feasibility and profitability of business strategies and projects, as well as public policy interventions. These techniques generally compare the total investment required for the implementation of a certain action against its potential returns. In terms of assessing the benefits from organic production and export, the challenge is to develop a methodology that includes economic, social and environmental aspects, particularly given that a clear monetary value can often not be assigned to public goods. UNEP (forthcoming) developed a three-indicator model that follows a Net Present Value analysis and includes: (i) investment and operating costs for greening production, complying with sustainability standards, and allocating financial resources to create enabling conditions; (ii) added economic, social and environmental benefits focusing on short-, medium-, and long-term impacts across sectors and actors; and (iii) costs that can be avoided as a result of adherence to sustainability principles and processes, such as the shift to organic agriculture.

1.4 Literature review

While organic agriculture has a relatively long history in South Africa (UNEP and UNCTAD, 2008), only a few studies have attempted to describe the South African organic industry in detail. Three of the most recent examples are the following:

- A South African Food Lab-commissioned project, concentrated on supporting smallholder development in South Africa (Landman, 2015; Kelly and Metelerkamp, 2015).
- The World of Organic Agriculture is an annual publication containing a comprehensive overview and most recent data on organic production worldwide. This publication is conducted by the Research Institute of Organic Agriculture (FiBL) and IFOAM Organics International (Willer and Lernoud, 2015).
- A study by the Fund for Research into Industrial Development, Growth and Equity (FRIDGE) to develop a value chain strategy for sustainable development and growth of organic agriculture in South Africa compiled by the Institute of Natural Resources (INR, 2008).

Besides an unmet and growing global demand for certified organic products, organic agriculture is often promoted in developing countries because of its potential to create employment in rural areas through sustainable agricultural farming practices. Further, organic agriculture contributes to community development through knowledge exchange and enables environmental benefits, such as the reversal of land degradation, desertification and climate change. One of the opportunities to achieve these objectives is a market-oriented approach, as it can yield premium sales prices and international trade partnerships for global niche markets (Panneerselvam et al., 2013; Preißel and Reckling, 2010; Bakewell-Stone, 2006). The market-oriented approach is stimulated by an increased consumer awareness of sustainable agricultural farming practices and fair working conditions, which drives demand for certified organic products to which the supply side of the market responds. To date, the demand for certified organic products is predominantly located in developed countries, mainly in the EU and the US (Ruetzler and Reiter, 2014). Due to the export orientation of developing countries, supply often comprises commercially-oriented organic farmers, but there are thousands of examples of small-scale organic farmers that feed into value chains for export, for instance in East Africa (UNEP and UNCTAD, 2008).

The market-oriented approach often involves a broad range of stakeholders, such as donor agencies, development organisations, export councils, organic producer organisations, exporters and import companies (Ruetzler and Reiter, 2014; ICROFS, 2010; UNEP and UNCTAD, 2008; Dimitri and Oberholtzer, 2006). Intermediaries, like traders and processors, are often located in the countries of destination. Their primary role is to identify consumer trends, facilitate trade flows, develop new products, and liaise with buyers such

as retailers, processors and other intermediaries in the country of destination. Hauser and Delve (2007) argue that intermediaries often decide independently about the crops to be produced and the markets to be targeted, as well as the quality standards to apply and the certification bodies to choose. Some even provide access to organic farm inputs, such as organic fertilisers and effective microorganisms. Moreover, a range of market-oriented advisory services and capacity-building initiatives, such as organic production methods, technologies and farm management skills, increase knowledge about organic production, which leads to higher productivity and better market orientation and access (ICROFS, 2010; Hauser and Delve, 2007).

The market-oriented approach comprises policy instruments to support the development of local and export markets for organic produce. Such policy instruments include organic regulations, standards and labelling schemes, and they can be developed by a range of actors, including government agencies, international organisations, retailers, producer associations, or non-governmental organisations. Product labelling, according to the organic standards of the EU or the US Department of Agriculture (USDA), for example, informs consumers that a product is compliant with a given regulation or standard, which builds trust among local and international clients (ICROFS, 2010; Dimitri and Oberholtzer, 2006; OECD, 2003).

A market-oriented approach is increasingly adopted in developing countries in Africa as it allows producers to access international markets and thereby improves the livelihood conditions of African farmers, including smallholders. This approach is often promoted by donor organisations, development agencies and producer organisations. As markets require a variety of products, the market-oriented approach provides opportunities for crop diversity. Intercropping and crop rotation minimise pests and enhance food security conditions, and are fundamental concepts of organic agriculture (AfDB, 2013; CBTF, 2008; Hauser and Delve, 2007).

Governments may also have a vested interest in developing an organic agricultural sector as it assists some of their development plans. In China and the Czech Republic, for instance, organic agriculture is promoted because of the benefits resulting from environmental protection, poverty reduction and export revenue generation (Egelyng et al., 2013; Paull, 2007). A policy-oriented approach to promoting a shift towards organic agriculture may have various reasons, which include:

- Organic agriculture contributes to the provision of public goods, for example in the environmental and social sphere. Public goods are generally regulated by policies and should be accommodated by the government, and not factored into organic food price premiums (EC, 2004; FAO, 2002).
- Even though it relies on old practices, certified organic agriculture is considered an infant industry that requires support by the government until it reaches a reasonably competitive level (Padel and Lampkin, 2007; Dimitri and Oberholtzer, 2006).
- Often, there is significant public support for incentives that encourage the adoption of organic agriculture, in order for small-scale farmers to build up their respective capabilities and capacities (EC, 2012b; UNEP and UNCTAD, 2008).

A policy-oriented approach involves a range of policy instruments to facilitate organic sector development. These instruments may include national organic regulations and standards that define the legally enforceable definitions of organic production (Padel and Lampkin, 2007). Generally, policy instruments would specify the standards for organic processing and outline the national procedures for organic inspection, certification and accreditation, organic labelling requirements and guidelines, as well as permitted inputs and practices (FAO, 2012; Padel, 2010; Stolze and Lampkin, 2009; Padel and Lampkin, 2007; EC, 2004; FAO, 2003). Källander and Rundgren (2008) add that a national organic policy provides an opportunity for producers to adopt organic agriculture methods and contributes to the development of a domestic organic market. At the same time, the absence of a regulatory framework is likely to hamper the local development of organic agriculture, because informed consumers want to be certain that products are free from harmful agrochemicals. A policy-oriented approach may also involve financial policy instruments by organic producers, traders and various government departments to foster the development of organic agriculture, for instance by providing financial incentives such as subsidies, tax reductions and exemptions. This may include reduced fees or free certification, for example supported by government or development agencies (Källander and Rundgren, 2008; Padel and Lampkin, 2007; Stolze and Lampkin, 2009; OECD, 2003).

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In many European countries, the government supported farmers during their conversion period through conversion subsidies or area support payments, which are based on the amount of hectares under conversion. Some studies reported that area support payments and organic regulations are the key policy measures encouraging the development of organic agriculture in Europe. Financial policies facilitate the development of an organic sector through different economic incentives which are based on market considerations and price mechanisms (Daugbjerg et al., 2011; Offermann and Nieberg, 2009; Stolze and Lampkin, 2009; FAO, 2002; Michelsen et al., 2001). At the same time, it would be equally important to evaluate and discontinue measures that discriminate or adversely impact the development of organic agriculture, such as subsidies for agrochemicals, mandatory seed treatments or fumigation of products.

While financial and legal policy instruments predominantly operate through state intervention, a communication-oriented policy works through research and communication in order to support an organic sector development; for instance by providing advisory services, training and organic capacity building programs. A communication-oriented policy involves awareness campaigns emphasising the importance of adopting organic agriculture methods, informing the general public (Stolze and Lampkin, 2009; Padel and Lampkin, 2007; Michelsen et al., 2001).

Another policy instrument for the development of the organic sector would be public procurement, where the state stimulates demand for organic products, to supply schools, hospitals, canteens etc. Sweden, for example, had declared a national goal to source at least 25 per cent of food in the public kitchens from organic farmers until 2010; while only 5 Swedish regions achieved this goal, it provided a clear and effective signal towards the market (Openup, 2015).

Overall, a mix of policy approaches is often applied to support the sustainable development of the organic sector. While the policy instruments may either be directed at the demand and/or the supply side, it remains essential to inspire both farmers and consumers to support organic agriculture and to adopt green measures (Daugbjerg et al., 2011). The effectiveness of addressing either target group depends on many factors that are further outlined in this study.

Based on the trade focus of this study, a market-oriented approach is suggested for further development of the organic agriculture sector in South Africa. While the export focus is characterised by specific standards and certifications that are essential to participate in formal retail channels, compliance with national regulations and standards is also increasing in many domestic markets, as the importance of food safety to all concerned is being increasingly recognised.

In the absence of trade data for organic products, there are some anchor points that result from demand rather than supply. First, organic products experience the highest market share in various European markets, and also in North America (Willer and Lernoud, 2015). From South Africa's export trade profile, it can be derived that most fresh produce is exported when 'out-of-season' in the respective destinations. Another case arises when products are not at all available in a third country because a product is endemic to South Africa, for instance, Rooibos and Honeybush herbal tea.



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2 Transition to organic agriculture in the context of the green economy

Although there is no universally accepted definition of a green economy, the concept can be broadly described as a set of economic activities that result in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2012). The term 'green economy' highlights the economic dimension of sustainability or, stated differently, shows that sustainability relies on aligning market dynamics and incentives with social and environmental objectives. Hence, a green economy can be seen as an enabling tool for reaching the overarching goal of sustainable development, with its three pillars (economy, environment, society).

Developing countries need to implement active developmental policies that can drive innovation and transformation in their economies to new dynamic green activities. Additionally, changes in trade patterns associated with the dissemination of new technologies play a vital role in the structural change needed for such transitions. Policies and investment are both needed to sustain and enhance the natural resource base of the economy, in order to enable developing countries to sustain and expand their export volume and productivity.

2.1 The green economy transition in South Africa

South Africa faces three main developmental challenges, namely unemployment, poverty and inequality. Its economic growth is heavily dependent on energy and primary resources (Montmasson-Clair, 2012). Due to the key developmental challenges and heavy resource dependency, climate change poses a significant threat to all sectors of the South African economy, as it may compound current resource scarcity, especially in terms of water, energy and food (AFRICEGE, 2014). South Africa is opportunely positioned to embrace a

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green development trajectory, due to the abundance of biodiversity and renewable resources in its territory. When facilitated by an enabling environment, green sectors can foster growth and employment creation in South Africa (Montmasson-Clair, 2012).

From 18–20 May 2010, the Green Economy Summit was convened by the South African Departments of Environmental Affairs, Economic Development, Trade and Industry, and Science and Technology, under the Economic Sectors and Employment Cluster, in close collaboration with the South African Local Government Association (SALGA) and the South African Cities Network (SACN). The summit, made up of a broad multi-stakeholder base, broadly committed to ensuring that the country's growth path is resource-efficient, far less carbon-intensive and more labour-absorbing, while mobilising and further developing the significant scientific and technological capacities of society at large. The Summit identified the following issues as the driving forces behind the green economy transition in South Africa (Green Economy Summit Report, 2010).

- Growing concerns about the environmental unsustainability of past and current economic growth patterns: the summit recognised that functioning ecosystems underpin all economic and social activity, and that ecosystem failure would compromise the country's ability to meet economic priorities, even in the short term.
- Increased awareness of a potential climate crisis: the Summit highlighted the fact that substantial growth in investment was necessary to achieve climate change mitigation.
- The need for a substantial transformation of behaviour and industry technologies and structures.

The Green Fund and other related interventions are aligned to ensure that South Africa attains its vision as outlined in the National Development Plan (NDP). Chapter 5 of the NDP deals with environmental sustainability and resilience (NPC, 2011). One of the key objectives mentioned is "increased investment in new agricultural technologies, research and the development of adaptation strategies for the protection of rural livelihoods and expansion of commercial agriculture". In line with the NDP, the National Strategy for Sustainable Development (NSSD), which was released by the Cabinet in 2011, identified five key action priorities:

- Enhancing systems for integrated planning and implementation;
- Sustaining ecosystems and using natural resources efficiently;
- Striving towards a green economy;
- Building sustainable communities;
- Responding effectively to climate change.

At the same time, the National Climate Change Response Strategy (NCCRS) also identified various priorities, which call for measures to reduce greenhouse gas emissions, to limit the country's dependence on fossil fuels, to build community resilience to climate change, and to ensure ecosystem resilience.

South Africa's main challenge in the transition to a green economy is the need to overcome socioeconomic challenges (poverty and unemployment) while moving away from industries that directly contribute to greenhouse gas emissions. Job creation has been lagging behind, as a result of which South Africa has felt the need to intensify industrial development. However, in the absence of alternative sources, this means that South Africa will continue relying (if not increase) its reliance on coal as its main source of energy. Recognising these challenges, the NDP confirms the need to combine economic development and job creation with both climate change mitigation and adaptation.

The mitigation strategy is specifically meant to ensure that the green economy transition is well-managed and that potential risks of job losses in the energy and mining sectors are minimised. Key challenges include:

- Limited research into the development of technology needed to support the transition.
- Lack of skills and infrastructure to support the adoption, diffusion and use of environmentally sound technologies.

- Regulations to support the transition can, in the short- and medium-term, lead to increased cost of living and create an additional tax burden.
- Greening production will likely increase the short-term cost of production which can impact competitiveness and compromise economic growth (Kaggwa et al., 2013).

2.2 Overview of organic agriculture and trade opportunities

IFOAM Organics International has defined organic farming as:

'...a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.' (IFOAM, 2012a)

Organic agriculture is a food and farming system that applies the sufficiency narrative. In comparison with conventional agriculture, it is less dependent on external inputs. For example, organic farming prohibits the use of energy-intensive nitrogen fertiliser and limits the use of phosphorus, as both are dependent on finite mining activities. While yields might be lower in the beginning (Mäder et al., 2002; De Ponti et al 2012; Ponisio et al., 2015), organic practices make it possible to reduce the use of fertilisers and energy by 34–53 per cent, and the use of pesticides by 97 per cent (Mäder et al., 2002). This means that organic farming systems are very resource-efficient.

The latest FiBL survey (Willer and Lernoud, 2015) shows that basic data on organic agriculture is available for 170 countries. In 2013 there were 43.1 million hectares of organic agricultural land, of which 3 per cent in Africa. Between 2012 and 2013, the area used for organic agriculture in Africa increased with 7 per cent.

In 2013, there were 2 million organic producers, mostly located in Asia, Africa and Europe. The countries with the highest number of producers are India, Uganda and Mexico; over 80 per cent of producers were located in developing and emerging economies. However, the largest organic markets are the United States, Germany and France. Although Asia, Australia, Latin America and Africa have increasingly become important organic producers, demand in these continents remains relatively small. Over 90 per cent of global organic sales are being generated in Europe and North America.

Organic areas do not only include farmland, but also terrains used for wild collection, aquaculture, forests and grazing. Wild berries, honey, and medicinal and aromatic plants account for the most important shares in the wild collection.

Due to price premiums on organic products, organic consumption in the EU/EFTA region largely relies on the readiness and ability of consumers to purchase above conventional product prices. In spite of mixed growth rates during the past few years, the highest per capita consumption of organic products is in Europe, but the growth of organic markets differs among European countries. European organic food and drink sales reached a financial volume of US\$ 31 billion in 2013. Germany has the largest market for organic products with a retail volume close to US\$ 10 billion, while Denmark has the highest market share for organic products of all groceries sold (8 per cent), followed by Switzerland (6.9 per cent) and Austria (6.5 per cent). At the European level, organic products comprise about 1 per cent of total food sales. Within the overall organic market in Europe, certain organic products are more dominant than others or sold mostly in particular countries (Willer and Lernoud, 2015).

The North American market is valued at US\$ 35 billion and continues to grow; the segment has reached already 4 per cent market share of total food sales (Willer and Lernoud, 2015). The conditions for organic food are similar in the USA and Europe, in the sense that demand exceeds supply, especially for organic fruits, vegetables, meat and dairy products. Like in Europe, the organic market in the USA is characterised by large food companies and retailers that are undergoing a consolidation as larger companies are buying market share through acquisitions across the organic sector. In the meantime, all leading retailers have established a private label for organic foods; for example, the Safeway O Organics brand already generates sales of over US\$ 700 million (Willer and Lernoud, 2015).

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From an export perspective, complexities arise, as exports need to comply with different regulations and requirements for each foreign market they wish to export to. The advantage of the European organic market is that suppliers only need one organic certification to access the many different sized markets and sales channels within EU member states. The European market can be regarded as a single market, which makes it an attractive export destination, especially for smaller farms and cooperatives.

In other regions of the world, organic food sales are valued at approximately US\$ 6 billion (Willer and Lernoud, 2015). A growing demand can be witnessed in Asian countries, such as Japan, China and Korea, as well as in Latin America, in countries like Brazil, Argentina, Peru, Chile, and Colombia. Further, Australia and New Zealand have an important domestic market for organic products (Willer and Lernoud, 2015).

There is a growing recognition among policy-makers that organic agriculture has a significant role to play in addressing food insecurity, land degradation, poverty, and climate change in Africa. Ruetzler and Reiter (2014) have described six central influential trends in consumerism, which influence the perception and behaviour regarding food production and purchasing. These trends can be instrumental in explaining the rise of organic agriculture in recent years. The six trends are explained in Box 1 below.

Box 1: Six megatrends explaining the rise of organic agriculture

- **Individualisation:** The selection of food, dishes, recipe, origin and so forth becomes an expression of personal values and thereby a form of self-expression.
- **Connectivity:** Describes the new organisation of people in networks of global reach, which opens up opportunities for organic sector development.
- **Neo-Ecology:** Describes the significant increase in global awareness and support for a change process towards a resource-efficient, sustainable economy with an underlying refocus on nature as the core of development.
- **Globalisation:** The digitalisation and ever-increasing mobility of people and goods open up a new global culture.
- **Health:** A clear, compact concept of healthy nutrition is sought after by consumers who strive to self-optimisation.
- **Mobility:** The mobility of people and goods has an enabling character for business; for the organic sector, mobility means new markets and development.

Source: Ruetzler and Reiter, 2014.

South Africa's main export markets are located in Europe, despite a decline in recent years. This decline is caused by a combination of factors. At general level, stricter food safety and retail standards have been introduced in Europe, while South Africa has opened new export markets through the BRICS arrangement. Furthermore, Europe recently experienced some good agricultural years, and invested in improved cooling technologies, which slightly reduced the demand for fresh off-season fruit.

Another challenge is the rising amount of eco-labels. Even though certified organic according to a national or regional standard remains the dominant eco-label, there is growing competition, as the food industry now has over 200 ecolabels that represent particular environmental, social, and/or production aspects. Agricultural commodities have the highest adoption rate of eco-labels. As a result of the growing array of eco-labels, consumers cannot always distinguish organic symbols from competing symbols and logos. In a study in which UK shoppers were asked about the logos they look for on organic products, 21 per cent of respondents stated the Fairtrade logo (Willer and Lernoud, 2015).

The inflation in eco-labels requires a clear communication of organic symbols and logos, and about what they represent. However, organic means different things to different consumer groups. In the USA, many consumers buy organic foods because they are perceived to be healthier and more nutritious than conventional foods.

In parts of Europe, environmental concerns are the primary purchasing motive, whereas in China and parts of Asia, organic means high quality and safer food products (Willer and Lernoud, 2015). The different perception in national or regional markets calls for a clear communication of standards and labels. To enhance international organic trade, the harmonisation or equivalence of standards is recommended. The EU and the USA have both implemented a regulation that is expressed via an organic label valid for the particular region (see Figure 1). As some European countries had a stricter organic regulation before, the EU regulation is considered a harmonised common denominator for organic production in and export to Europe (Padel, 2010; Schmid et al., 2007).

Figure 1: Organic labels valid in the European Union and the USA



Source: USDA website

2.3 Trade opportunities arising from organic agriculture

2.3.1 Trade opportunities through certification and labelling of agricultural products

The relationship between trade and the environment was highlighted in the preamble of the Marrakesh Agreement which recognised “that their relations in the field of trade and economic endeavour should be conducted with a view to raising standards of living, ... while allowing for the optimal use of the world’s resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment” (1994) and also in paragraph 31(iii) of the Doha Ministerial Declaration (WTO, 2001) in which the parties agreed to negotiate on “the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services”. These negotiations are still ongoing.

Trade liberalisation can lead to a more efficient allocation of natural resources, and stimulate growth and a rise in income levels. Trade can also improve access to the green goods, services and technologies that are needed to enhance water supply and sanitation, to reduce pollution and energy use, or to improve resource efficiency. Trade promotes production and resource efficiency through specialisation, economies of scale, technology transfer, and enhanced market competition.

Openness helps countries compete by not only offering new market opportunities for sales (i.e. exports) but also by making a wider range of inputs available to producers at a most competitive quality–price ratio (i.e. imports). Trade can play a key role in helping the environment, in part because it serves as a channel for green innovation and technology transfer. Openness to trade provides access at lower cost to a greater variety of imported goods and services involving environmentally sound technologies. It also increases market sizes for producers of final goods and suppliers of components, thus raising the returns from innovation for those involved in the production networks involving green goods. The ability to market innovations globally makes it possible to increase specialisation, and provides an incentive to produce green goods, even when intensive research is required (WTO, 2011).

International trade can assist South Africa in facilitating investment in environmental goods and creating opportunities for growth, development and employment. However, tariffs and non-tariff barriers can hinder the trade in environmental goods and the transfer of environmentally sound technologies. Trade in environmental goods faces a range of non-tariff barriers, such as local content requirements and differing industrial standards and certification requirements. While certification requirements are perceived to be a barrier to trade due to the associated costs and technical requirements, certification can also lead to various benefits. For example, the organic certification of goods can be used to create demand for goods produced in South Africa for which enhanced market access and a price premium can be obtained.

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The first stage in the process of certification and verification for the production and sale of organic produce is the conversion to a system of production in accordance with recognised organic standards. The second stage involves obtaining certification and annual reinspection. There seem to be three key constraints to farmers, especially small- and medium-sized farmers, with adopting certifiable organic farming practices, namely

- lack of knowledge of organic practices and requirements (especially if the crop is produced for foreign markets);
- a perceived inapplicability and inflexibility of many of the regulations required by certifiers and inspectors; and
- requirements for record keeping.

On the other hand, selling produce with an internationally accepted certificate clearly has many benefits for farmers and producer groups. The benefits associated with the production and trade of organic agricultural goods include price premiums for farmers (especially for export to developed countries); market access opportunities in new markets; increased market access in existing export markets; the development of auxiliary industries; the development of different approaches to traditional farming techniques; and the establishment of formal producer groups or cooperatives (building social capital) (Delbridge et al., 2011; Harris et al., 2008).

Farmers need to determine whether the costs and constraints associated with the certification process outweigh the price and trade benefits and opportunities, for which the type and size of the farming operation are important factors. This study provides a framework for identifying and assessing the costs and benefits from organic production and export, thereby accounting not only for economic factors but also for social and environmental externalities.

2.3.2 Aspects of sustainable trade in the agricultural sector

The transition to a green economy requires an enabling legal and regulatory framework for aligning economic incentives and market dynamics with environmental and social objectives. However, there is not one single approach to create the appropriate policy environment, but merely a range of best practices. Various countries will take different approaches in designing policies to shift to a green economy, depending on their policy settings and institutions, the level of development and resource endowments, as well as their particular environmental challenges.

A common consideration is to ensure that green economy measures promote new ways of addressing environmental problems through innovation. Sustainable agriculture uses principles of ecology and takes the relationship between organisms and their environment into account. Aspects and trends that impact on trade flows in sustainable agricultural products and services include:

- The production systems, policies and institutions that underpin global food security are increasingly inadequate.
- Sustainable agriculture needs to nurture healthy ecosystems and support the sustainable management of land, water and natural resources while ensuring world food security.
- The global transition to sustainable food and agriculture will require major improvements in resource efficiency, environmental protection and systems resilience.
- Sustainable agriculture requires a system of global governance that promotes food security concerns in trade regimes and policies, and that revisits agricultural policies to promote local and regional agricultural markets.

In South Africa, the conditions for agricultural production are increasingly unfavourable due to poor land quality, variable climatic conditions, and scarce water resources. The majority of agricultural policy reforms in the past has focused on measures to address injustices, including land redistribution, agricultural support programmes to disadvantaged farming communities, and a broad-based programme of economic

empowerment of the black population. Only recently did reforms of agricultural policy also include a focus on decent work and environmental sustainability. The Agricultural Policy Action Plan (APAP) of 2015–2019, developed by the Department of Agriculture, Forestry and Fisheries (DAFF), includes the promotion of climate-smart agriculture (CSA) to address food security issues. According to the APAP, the development and implementation of CSA in South Africa is based on organic farming, agro-ecology and conservation agriculture. It also states that all CSA interventions and the monitoring thereof must be farmer-driven.

‘There is a need for policy development driven by human capital with farmers, women, and youth at the centre of attention and resources. It is important that institutions work with different sources of financing to put the three pillars of CSA into practice. Therefore, there is a need for generating evidence for interventions, financing climate change interventions and creating an enabling environment, in directing and supporting interventions and the constraints to agricultural productivity and food security in the era of climate change.’
(APAP, 2015)

Key aims of the action plan include improved irrigation practices and techniques, management of invasive alien species, the creation of positive incentives, and CSA capacity-building programmes. These measures can significantly contribute to the export of sustainable produce.



3 The agricultural sector in South Africa

This chapter describes the agricultural sector in South Africa. It starts with the main characteristics of the sector and its role in the economy, the society and the environment. Key trade statistics are provided regarding the Harmonised System, expressly highlighting how trade data is aggregated in South Africa. Further, this chapter provides an overview of organic farming in Europe and Africa, and of trends impacting the organic but also the agricultural / food sector in general. Moreover, challenges to the organic industry are discussed, with a focus on certification and labelling. South Africa is characterised as a dual economy and reference is being made to what this entails, and which opportunities it offers in terms of international trade. The last section assesses selected product categories that are well qualified for realising organic export opportunities, which is underpinned by a number of industry profiles as well as insights from customers of South Africa.

3.1 Overview of the agricultural sector and key trade statistics

South Africa has a diverse agricultural sector that comprises field crops, horticulture, animal production, dairy farming, fish farming, game farming and agro-processing. Within these sectors, 39 subsectors exist which include both primary and secondary activities (AgriSETA, 2010). These subsectors are important to socioeconomic development in South Africa, as they are among the most employment-intensive ones. While commercial agriculture contributes approximately 7 per cent to formal employment, its contribution to South Africa's GDP is only about 3 per cent. There are also strong backward and forward linkages into the economy, including purchases of fertilisers and implements, and the supply of raw materials for the manufacturing industry. The agro-industrial sector is estimated to contribute 12 per cent to GDP. Despite the farming industry's declining share of GDP – from 7.1 per cent in 1970 to 1.9 per cent in 2011 – it remains vital to the economy, development and stability of the southern African region, and an important source of economic growth and employment in South Africa (South African Yearbook, 2013/2014).

South Africa can be divided into distinct farming regions according to climate, natural vegetation, soil type and the type of farming practised. Agricultural activities range from intensive crop production to cattle ranching and sheep farming. The field crop planted over the largest area of farm land is maize, followed by wheat, sugar cane and sunflower. The grain industry is one of the largest industries in South Africa and the most important source of carbohydrates in the Southern African Development Community (SADC), for animal and human consumption (South African Yearbook, 2013/2014). The variety of agricultural products produced in South Africa is reflected in Table 1 below.

Table 1: Main agricultural products produced in South Africa

Product class	Examples and key figures
Grains	Maize, wheat, malting barley and sorghum
Oilseeds	Groundnuts, sunflower, soy beans and canola
Sugar	Sugarcane cultivation
Deciduous fruits	Apples, pears, apricots, nectarines, peaches, plums, grapes, olives, figs and cherries
Cotton	74 per cent of the natural fibre and 42 per cent of all fibre are processed in South Africa
Tobacco	79 per cent of total domestic production is flue-cured leaf tobacco
Honeybush and Rooibos tea	30 per cent of Honeybush is cultivated, and 70 per cent is a wild harvest. The majority of Rooibos is farmed commercially, yet a significant portion is wild harvest.
Grapes and wine	Includes juice and concentrate for non-alcoholic purposes, wine for brandy and distilling wine
Citrus and subtropical fruit	Oranges, pineapples, avocados, mangoes, bananas, litchis and guavas
Vegetables	Potatoes, tomatoes, onions, cabbages and dry beans
Dairy farming	Dairy breeds Holstein, Jersey, Guernsey and Ayrshire
Animals and animal products	Cattle, sheep, goat, pigs, poultry and game

Source: South African Yearbook (2013/2014)

Climate-soil combinations leave only 12 per cent of domestic land suitable for the production of rainfed crops. Of the total arable land, high-potential land comprises only 22 per cent, and only 3 per cent is considered to be truly fertile land. Most of South Africa's land surface (69 per cent) is suitable for grazing, and livestock farming is by far the largest agricultural sector in the country.

The most important factor limiting agricultural production is the availability of water. Almost 50 per cent of South Africa's water resources are being used for agricultural purposes. Rainfall is distributed unevenly across the country. Some 1.3 million hectares (ha) of agricultural land are under irrigation due to unevenly distributed rainfall patterns. This represents 1.5 per cent of South Africa's total agricultural land. Declining farming profitability, as well as water scarcity – caused by drought, declining rainfall or excessive water demand – have left South Africa with less than two-thirds of the number of farms it had in the early 1990s. In many instances, the lost farms have been changed to other land uses or consolidated into larger farming units to achieve effective economies of scale. Although the area for maize, wheat and dairy cultivation (5 per cent of the national herd) has decreased significantly over the last 20 years (WWF, 2008), production remains relatively constant, indicating a trend towards intensified production.

According to the FAO statistical database,¹ the value of domestic agricultural production in 2012 was approximately US\$ 25 billion. Of this, 54 per cent were attributed to the production of crops (field and

¹ faostat3.fao.org/home/E.

horticulture) and 46 per cent to livestock production. The field and horticultural crops that contributed most significantly towards total production were maize, grapes, wheat and potatoes. The majority of horticultural products are produced in those regions with high-quality land and sufficient water resources, or in areas where land is under irrigation. Wine and fruit are the two most prominent horticultural products being produced in South Africa. In 2012, fruit production was dominated by the production of grapes, oranges and apples, while vegetable production was focused on potatoes, tomatoes and onions. In 2013, South Africa's crop production was concentrated in maize, potatoes, wheat, grapes, oranges and apples. During the year, a total of 12.5 billion tonnes of maize, 2.3 billion tonnes of potatoes, 1.9 billion tonnes of wheat and grapes, 1.6 billion tonnes of oranges and 811 million tonnes of apples were produced.

Currently, the fruit sector is the most export-oriented of all the horticultural crops produced, while vegetable production is more orientated towards satisfying domestic demand. Approximately 85 per cent of table grapes and 70 per cent of avocado production is exported while exports of citrus fruits and apples are approximately 50 per cent and 33 per cent, respectively, of total production.

Between 2005 and 2014, South Africa's exports of agricultural products increased by 11 per cent while imports increased by 10 per cent. South Africa's main export destinations for agricultural products in 2014 were the Netherlands (8.63 per cent of total exports), Namibia (7.94 per cent), the UK (7.12 per cent), Botswana (6.73 per cent) and Zimbabwe (6.19 per cent). South Africa mainly imports agricultural products from Indonesia (6.39 per cent), the UK (6.34 per cent), Argentina (6.27 per cent), the Netherlands (4.91 per cent), and Brazil (4.80 per cent). In 2014, South Africa's main agricultural export products were citrus fruit; grapes; apples and pears; wine; maize; and unfermented fruit and vegetable juices. Main import products were rice; palm oil; poultry; cane and beet sugar; and soybean oil cake.²

Trade data is generally depicted according to the Harmonised Commodity Description and Coding System (HS Codes). HS codes represent different products categories at differentiated levels of aggregation; the more digits the HS code has, the more descriptive and distinct the products. HS codes are internationally standardised up to the six-digit (HS6) level. This enables the comparison of trade data among countries. However, within the HS6 level no distinction is made between traditional and organic products. For instance, trade data for wine is reported as HS code 22, but the HS codes do not allow for a further distinction in terms of organic vis-à-vis conventional wine traded. South Africa's imports and exports of wine are recorded by code HS 2204, which include conventional and organic wine. HS codes beyond the six-digit level are subjective to specific countries and the products they trade. This has created the opportunity for countries to differentiate between conventional vis-à-vis organic trade data. Currently, only a small number of countries, including the USA and some EU countries, have started to identify organic trade HS codes beyond the HS6 level. However, the majority of countries, especially developing countries, are yet to make such distinctions, which significantly limits the availability of organic trade data.

To date, only a few studies made an effort to quantify and describe the organic industry in South Africa. The two most recent examples are the FRIDGE study (INR, 2008) and FiBLIFOAM's annual report World of Organic Agriculture (most recently, Willer and Lernoud, 2015). While based on voluntary inputs, the FiBL datasets are the most comprehensive global effort to consolidate reliable statistics of the organic industry.

In South Africa, government or industry bodies do not collect data regarding organic produce. The statistics of the Perishable Products Export Control Board, which has to approve products destined for export, do also not capture data for organic products specifically. This leaves provision of market information to international organic certification bodies. By and large, the different international data sets do not follow a standardised format that would be required for data aggregation. Indeed, aggregated data would be most helpful for a progressive sector development.

3.2 Organic sector development in South Africa

AgriSETA (2010) characterises South Africa's agricultural sector as a dualistic sector, i.e. a modern commercial farming sector that employs hired farm labourers alongside small scale farmers. The distribution of land in South Africa is highly uneven, and the commercial farming sector owns about 39,000 farms, which amounts to about 80 per cent of all agricultural land (CSP, 2012). At the same time, it is estimated that South Africa has about 2 to 4 million subsistence and smallholder farmers, who are mainly settled in the former homelands. Most of them are cultivating small land plots of 0.5–1.5 ha and have limited access to services, inputs, agricultural advice or markets. There are about 240,000 smallholder farmers in South Africa who produce for the market. Box 3 describes the three prevalent categories of farmers in South Africa.

Box 2: Key statistics for organic agriculture in South Africa

Within Africa, South Africa has been a leading consumer of certified organic produce. However, in terms of production it lags behind other African countries, especially compared to East Africa (Willer and Lernoud, 2015; Willer and Yussefi, 2006). Overall, the status of the organic segment can be broken down into three categories, which are described in more detail throughout the study.

1. Production

- Globally, the organic agricultural land has increased to 43.1 million ha, from 11 million ha in 1999. Of this amount, almost two-thirds are grassland/grazing areas. The cropland area constitutes 10.9 million ha, i.e. 7.7 million ha of arable land and 3.2 million ha of permanent crops (Willer and Lernoud, 2015).
- In Africa, there are 1.2 million ha of certified organic agricultural land, which is 0.2 per cent of the global organic area. Overall, 39 African countries reported data on organic farming, and from available data 47 per cent of all organic farmland was used for permanent crops, 19 per cent for arable crops and 5 per cent for grassland/grazing areas (Willer and Lernoud, 2015)
- In terms of certified organic land, South Africa has moved down from 50,000–45,000 ha (4th position) in 2005 to 37,466 ha (8th position) in 2015. If wild collection is included, the total certified organic land in South Africa is 69,175 ha (Willer and Yussefi, 2005; FiBL, 2015).
- In Africa, there are more than 574,000 organic farmers, and South Africa has slightly improved from 200 farmers in 2005 to 250 farmers in 2015 (FiBL and IFOAM; 2005; FiBL, 2015). It is important to note that the farm size varies significantly, and South African farms are generally larger in size than in other African countries (Wiggings, 2009).
- Wild collection plays a significant role in Africa, more than 10 million ha are certified organic, of which 31,709 ha in South Africa (Willer and Lernoud, 2015)
- Main certified organic crops from South Africa are vegetables, tropical fruit, temperate fruit, citrus fruit, grapes, culinary herbs and spices (Willer and Lernoud, 2015).

2. Domestic demand

- South Africa is one of the few African countries with a substantial domestic market for organic products (INR, 2008)
- South African middle and upper-income consumers are willing to pay a price premium (Biénabe et al.; 2011)
- Pick'n Pay and Woolworths are the only big retailers who mention organic produce in their annual reports. Woolworths reports a growth from ZAR 0.67 billion in 2011 to ZAR 4 billion in 2013 for the free-range and organic category. Pick'n Pay highlights the availability of organic suppliers as a key priority in expanding its organic range. Pick'n Pay agreed to provide dedicated shelf space for organic produce in 50 stores countrywide, and Spar and Shoprite followed with support for the Organic Farmer Retailer Programme (OFRP) by the Department of Trade and Industry (Kelly and Metelerkamp, 2015; INR, 2008)
- Limiting factors for the growth of domestic demand for organic products are the consistency and availability of supply (Kelly and Metelerkamp, 2015).

3. Export potential

- The global market for certified organic food and beverage products reached US\$ 72 billion, of which Europe (the 28 member states of the EU plus Switzerland) accounted for 43 per cent of total retail sales (Willer and Lernoud, 2015).
- As a single market, Europe is equally valuable as the US, and export destinations commonly cited include Germany, the Netherlands and the United Kingdom (Willer and Lernoud, 2015).
- The largest consumer markets were Germany with a share of 31 per cent share of the European market, followed by France (18%), the UK (9%), Italy (8%), and Switzerland (7%) (Willer and Lernoud, 2015).
- South Africa has listed 49 organic exporters and one organic importer (Willer and Lernoud, 2015).
- South African producers have, inter alia, the advantage of selling 'out-of-season' products to the EU and the US (Willer and Lernoud, 2015).
- The EU and the US currently constitute more than 90 per cent of the global market for organic products (Willer and Lernoud, 2015).
- In the FRIDGE study, 60 farmers reported sales of ZAR 160 million for organic products. This share was roughly 54 per cent of the domestic market and 46 per cent of exports. The export market constitutes a significant market for organic producers (INR, 2008).

Box 3: Farmer Categories in South Africa

1) Subsistence/resource poor farmers

A category of farmers who, due to resource and technology constraints, produce food to supplement their household food needs, with little or no selling of produce to the market.

2) Smallholder farmers

Smallholder farmers produce food for home consumption, as well as sell surplus produce to the market. Due to the erratic nature of their production, less successful smallholders will sometimes regress into the resource-poor/subsistence farmer category. However, the more successful ones will graduate into the commercial category. This category is therefore intermediate between subsistence and commercial.

3) Commercial farmers

This category of farmers produces primarily for the market and makes considerable living from farming. In practical terms, in order to be classified as commercial, farm income must exceed a minimum threshold. Due to the expensive nature of capital formation and implementation of technological processes, the landowners of such farms are often large in scale to counteract the low returns on investment in the sector.

Source: CSP, 2011.

When it comes to export, the Department of Trade and Industry (DTI) has developed a “dual logic” of two support mechanisms for farmers, namely the National Exporter Development Programme (NEDP) and the Export Marketing and Investment Assistance Scheme (EMIA). The purpose of the NEDP is to increase exports, particularly of those products and services that add value and contribute to employment and the green economy. The target group is small, micro and medium enterprises (SMMEs). The EMIA scheme supports the development of export markets for South African products and services, and to recruit new foreign direct investment into the country by providing export marketing assistance through individual or group offerings, such as national pavilions and outward selling missions. As exporting companies develop in stages, the DTI created a training programme, the Global Export Passport Initiative. This initiative focuses on export expertise and the training of emerging and experienced exporters to ensure their export-ready status and ability to consistently compete in the international market (DTI, 2013).

Any export development and marketing strategy will have to take cognisance of the need for compliance with various private and public standards or certification, such as GlobalGap or International Standards Organization (ISO) 22000, and production process regulations / standards, such as EU Organic, Bio Suisse etc. In the EU and EFTA markets, there is a variety of legislation that governs the quality of produce that may be imported, marketed and sold in the market. Besides, as there is an increasing consumer conscience about health and safety issues, main retailers often require compliance with private standards; and sometimes, private standards are adopted as regulation thereafter. Depending on the product, Global Good Agricultural Practices (Global GAP) and/or food safety methods like Hazard Analysis and Critical Points (HACCP) are independently certified and generally required by legislation for European producers and for food imported into Europe as outlined in regulation EC 852/2004 and the ISO 9000 management standards system.

Some examples are outlined below.

- The Social Accountability 8000 (SA 8000) certification is a management system based on International Labour Organization (ILO) conventions, which addresses issues such as child labour, health and safety, and freedom of association. A conformity assessment is conducted annually by a third party and has become a necessary tool for successfully accessing any European market.
- Environmental accountability is increasingly important as consumer movements are lobbying against the purchasing of non-environmentally sound or non-sustainable produce. Both governments and private parties have created standards and labels to ensure that products adhere to particular specifications. Also, there is a broad range of social and environmental standards, such as Fair Trade, UTZ, the Soil Association, and a range of organic regulations and standards. The EU-certified organic standard is a baseline standard confirming compliance with a basic eco-friendly production benchmark. This standard is not strict enough for some retailers and consumers, who prefer private standards such as BioSuisse, Naturland, Bioland, or Demeter.

When evaluating viability for market access, importers need to not only comply with legal requirements, but also with non-regulatory ('soft') market requirements, including consumer demands. In more sophisticated markets, consumers enquire increasingly about environmental, social, health and safety aspects of both the products and the production techniques. Social and environmental accountability is becoming more important across the food industry, and the driving forces are retailers, consumers and media, which are influenced by trends and latest research.

In conclusion, labels and standards have become an increasingly important tool for market access; and they not only allow access to formal markets with the potential for economies of scale, but also to valuable niche markets. Consumers are becoming more aware that they can influence conditions at the point of production through their purchase patterns. Labels provide direction for those who are consciously aware and wish to make environmentally or socially sound consumption choices. The choice of standard often depends on the export market and purpose; in turn, this requires market intelligence, and a specific operational skill set to meet standards and certification requirements. The NEDP promotes an ideal-type path development from domestic enterprise to global exporter, the underlying assumption being that compliance with labels and standards is a result of a producer's export readiness. It is important to expand the South African base of exporters and establish their market access readiness and competitiveness. This should be enhanced through a capacity-building programme under which NEDP participants can practically learn from established commercial operations via an internship or apprenticeship opportunity (see chapter 6).

3.3 Assessment of selected categories of organic products

This section assesses the export opportunities for a selection of agricultural products from South Africa.

Rooibos:

Rooibos is a herbal tea, which received trademark protection under the Geographical Indicators framework of South Africa's intellectual property laws in 2014. A significant portion of the Rooibos production is already certified organic. Moreover, production is placed in and around the Cape Floristic Region, a UNESCO World Heritage site. The geographical indication was an important step in protecting South African products and promoting economic growth and competitiveness for the Rooibos industry. Rooibos is widely applied in foodstuffs as well as health and beauty products. The health effects of Rooibos are well publicised; its skin protection and anti-allergenic characteristics are amongst the properties that appeal to cosmetic manufacturers. Hence, Rooibos has a wide application and provides opportunities for numerous product innovations. Other indigenous products from the Cape Floristic Region, such as Buchu or Honeybush, might have similar beneficial properties (SARC, 2014).

Currently, 99.5 per cent of all Rooibos is cultivated, with the remaining 0.5 per cent harvested from the wild mostly by small farmers. The land available for cultivation is 95,000 ha, and annual harvest is estimated at 15,000 tonnes. About 580 producers grow Rooibos, of which approximately 220 are commercial producers, 10 Historically Disadvantaged Individual³ producers and 350 small farmers. Within the Rooibos segment, organic certification has the biggest volume, with about 40 commercial producers and 4 small farmer cooperatives certified. Also, there are 3 commercial farms, and 2 small farmer cooperatives that are Fairtrade-certified, and 4 Rainforest Alliance-certified commercial farms (UTZ Certified, 2015). The small farmers are either organised in 1 of the 5 organic cooperatives (DAFF, 2012) or are operating independently; all of the producers either sell their tea to the 8 main processors in the sector or they contract them to process their tea. The biggest processor is Rooibos Ltd., with a global market share of about 70 per cent. Another 25 per cent are rather equally shared among the next three biggest processors; the remaining 5 per cent are distributed among the smaller processors. There are approximately 5,000 people employed by the industry, either working on farms or at the processing facilities (UTZ Certified, 2015; DAFF, 2012; Bramley et al., 2009).

Exports of Rooibos to the European Union and the US are duty-free, and no distinction is made between bulk and packaged teas, while in Japan rooibos tea has 3 per cent import duty. Major export destinations are located in Europe, with Germany, the UK and the Netherlands accounting for almost 90 per cent (DAFF, 2014).

3 Historically Disadvantaged Individuals (HDI) are South African citizens who had no franchise in national elections prior to the end of apartheid. Women and disabled people are considered HDIs, as long as they were South African citizens during apartheid rule (Republic of South Africa, 2013).

Honeybush:

Honeybush (*Cyclopia* spp.) is indigenous to the cape of South Africa. It is used to make a beverage and a medicinal tea, and has a pleasant, mildly sweet taste and aroma, somewhat like honey. Only 20–25 per cent of the Honeybush is cultivated, with the remaining 75–80 per cent harvested from the wild. The land available for cultivation is 230 ha and the land used for wild collection is approximately 30,000 ha; the annual harvest is estimated at around 200 tonnes. All wild harvested Honeybush could potentially be certified as organic; in reality, only approximately 15 per cent are certified due to the high cost of organic certification (SAHTA, 2011; DAFF, 2013b; DAFF, 2006). Honeybush is cultivated by approximately ten growers with over one hectare each, plus a few growers with smaller plantations. Of the ten major growers, seven are commercial, and three are community-based. These previously disadvantaged communities in Haarlem, Ericaville and Groendal make up about 15 per cent of the total area under cultivation (DAFF, 2013b; DAFF, 2006). Additional Honeybush plantations in and around communities are likely to emerge, due to the suitability of the growing conditions in specific areas. This development will provide further employment opportunities and contribute to black economic empowerment and skills transfer (SAHTA, 2011). The current Honeybush industry involves five processors that are also responsible for the marketing component of the industry. Around 500 people are currently employed by the industry, either working on farms or at the processing facilities. Most Honeybush tea is exported to Germany, followed by the UK and the Netherlands (DAFF, 2013b). According to major clients, most of the herb is currently imported in bulk and then mixed with various herbal and tea composites before being marketed as loose leaf or packed speciality tea blend. At this stage, Honeybush is not used by major brands as stand-alone variety, because South Africa's annual production capacity is too small.

Wine

The South African wine industry has a highly diversified offer, as it also includes natural, fortified, distilling and sparkling wine, as well as wine for brandy, and also grape juice or concentrate. The South African wine industry counts 3,323 producers, of which the majority produces less than 500 tonnes per year. About 850 producers generate 500–5,000 tonnes per year, and only 13 producers reach a volume of 5,000–10,000 tonnes (SAWIS, 2014). The South African wine industry employs a total of 289,151 people, of which 43,644 are skilled, and 84,769 are semi-skilled (SAWIS, 2015). The contribution to national GDP was ZAR 36,145 million, with a contribution of ZAR 17,783 million to South Africa's balance of payments. The land available for cultivation of wines is 99,680 ha, which stretches over an area of some 800 kilometres in length. In 2013, South Africa produced 915.5 million litres of natural wine, of which 525.6 million litres were exported. Among the ten main export destinations are seven European countries jointly accounting for almost 262 million litres, led by the UK, Germany and Sweden (SAWIS, 2014; SAWIS, 2015). As exemplified in Box 4 below, there are significant opportunities for South Africa to expand organic wine exports to these markets.

There are 41 organic or bio-dynamic wine producers in South Africa (Dinan, 2014). The World Wildlife Fund (WWF) leads a Biodiversity and Wine Initiative (BWI) in South Africa, which counts 175 members who together farm 141,199 ha. To qualify as a BWI member, one has to provide a minimum of two hectares under conservation and a long-term environmental management plan.

Box 4: Systembolaget – the Swedish national liquor store operator



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Systembolaget is the government-owned chain of liquor stores in Sweden, the only retail store in the country allowed to sell alcoholic beverages that contain more than 3.5 per cent alcohol by volume, and one of the world's largest retailers of alcoholic beverages. Systembolaget distributes 30 million litres of South African wine via almost 60 importers and through approximately 500 distribution locations covering all of Sweden.

Over an extended period, South African wines have ranked in first sales position. Recently, volumes have dropped due to a change of consumer preferences towards Italian wines, and reasons include a different taste profile and appealing lifestyle, and also compliance with organic certification. It is expected that this tendency will continue because Systembolaget has committed to trading 20 per cent of its products as certified organic by the year 2020, compared to 15 per cent today. Demand for certified organic wine is growing in Europe, while the quality of organic wines has also improved significantly.

Source: <http://www.systembolaget.se/>



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4 Regulatory Environment

According to the latest FiBL survey (2015) on organic rules and regulations, 82 countries have implemented an organic standard and 16 countries are in the process of drafting their legislation regarding organic standards, including South Africa. Another group of countries has not ratified an organic legislation as yet but implemented national organic standards regulating the production, in order to create an opportunity for certification services (Willer and Lernoud, 2015). While a comparatively low number of countries established an organic certification system, many low-input or traditional farming systems are de facto organic systems (IDWG/OA, 2007). Globally, organic production is guided by the Codex Alimentarius and the IFOAM Standard.

This chapter provides regulatory insights of organic certification in the international context, describes and gives reference to the legislative context in South Africa, and picks up on the debate whether organic certification should be perceived as Technical Barrier to Trade (TBT).

4.1 Establishment of organic certification and accreditation

Organic production dates back to the early twentieth century. It originated primarily in Europe and North America through joint initiatives of farmers, processors and traders, who wanted to develop a farming system that would enable them to simultaneously support environmental protection (Kuepper, 2010). Over time, compliance with standards has become a market requirement to ensure that organic production and processing systems maintain truly organic farming methods and as a means to distinguish between organic and conventional production and processing (FAO, 1998; EC, 2008; Rana and Rana, 2013). In the context of organic certification and accreditation, an understanding of some key concepts is crucial.

Trade in Certified Organic Agriculture – Challenges and Opportunities for South Africa

Certification is described as a procedure by which a third party provides written assurance that a product, service or system meets the requirements of a standard (ISO, n.d.). In this context, organic certification refers to a process by which producers, processors and traders are certified to assure that minimum requirements, as defined in the relevant standard for organic production, are met. The certification is conducted by an independent certification body, which issues an inspection report. If the inspection report concludes positively, a certificate of compliance is issued (INR, 2008; IFOAM, 2014b). The ISO guides for certification bodies are ISO Guides 62, 65 (today, ISO 17065) and 66.

While ISO does not set requirements for the organic production itself, the ISO Guide 17065 provides guidelines for a certification body to operate and apply an organic standard, according to an internationally recognised certification standard. In this context, it is important to note that a certification body is not allowed to advise or consult a client on how to achieve the mandatory requirements of a standard, as this would result in a conflict of interest (ACMA, 2015).

Labelling refers to a logo or symbol that indicates compliance with a standard. Labelling is aimed at communicating compliance towards the consumer of the product. While labelling confirms that a product meets the requirements of a particular standard, it does not necessarily require an accreditation procedure for the auditing entity (INR, 2008; INR, 2006). Certification, in contrast, describes that a product or process has been audited by an independent third party, which has indeed been verified by an accreditation procedure beforehand. Both certification and labelling may use logos / symbols to show compliance with a given standard.

The International Standards Organization is the largest developer of voluntary standards in the world, with members from 163 countries. For South Africa, the ISO member is the South African Bureau of Standards (SABS). Product standards are specifications and criteria for characteristics of products, whereas process standards are criteria for the way products are made. The latter applies to environmental, organic and social standards in agriculture, which are developed to improve and promote sustainability of existing farming and agro-trade systems (FAO, 2003; FAO, 2007; INR, 2008).

Accreditation refers to a procedure by which an authoritative body formally recognises that a certification body is competent to perform specific tasks. Accreditation allows a certification body to determine whether it can conduct certification programmes. Generally, certification bodies are accredited by a governmental or authoritative parastatal body, which evaluates compliance with guidelines developed by the standard-setting body (FAO, 2003; UNCTAD, FAO and IFOAM, 2005). For accreditation, ISO Guides 58 and 61 are of most relevance.

The International Accreditation Forum (IAF) is the global association of conformity assessment accreditation bodies. Its primary purpose is to develop an internationally unified programme of conformity assessments. In the IAF, South Africa is represented by the South African National Accreditation System (SANAS), which is recognised by the South African Government as the single national accreditation body that gives formal recognition to laboratories, certification bodies, etc. (IAF, n.d.; SANAS, n.d.).

4.2 International challenges of organic legislation

An organic certification is based on standards, and national governments develop standards to provide meaning to the term 'organic'. The organic sector offers a broad range of private standards and individual government regulations. Moreover, there are two international base standards for Organic Agriculture, namely the IFOAM Standard and the Codex Alimentarius. Due to its nature of membership, governments feel more comfortable with the Codex Alimentarius Commission, while the private sector feels more comfortable with the IFOAM Standard (Bowen, 2002; UNCTAD, FAO and IFOAM, 2008; EC, 2012a). Those two standards are described in more detail below.

The Codex Alimentarius is a collection of internationally recognised standards, codes of practice, guidelines and other recommendations relating to foods, food production and food safety. In terms of organic production, the Guideline 32-1999 informs the production, processing, labelling and marketing of organically produced foods. While it has been drafted as a minimum standard for organic production, it does allow countries to establish more detailed country-specific standards, according to their requirements. The guidelines were adopted in 1999 and have been regularly reviewed and amended, particularly the criteria for permitted substances (FAO, 2003; UNCTAD, FAO and IFOAM, 2008; EC, 2012a; Codex, 2013).

IFOAM was established in 1972 and is the international non-governmental umbrella organisation for organic agriculture organisations. Over time, IFOAM has created a globally applicable organic standard that can be used directly for certification. The IFOAM Standard forms part of the IFOAM Norms, which include the Common Objectives and Requirements of Organic Standards (COROS) and the IFOAM Accreditation Requirements for Bodies Certifying Organic Production and Processing (IFOAM, 2014a).

The IFOAM Norms provide a framework and assist certification bodies and standard-setting organisations in their efforts when developing a national or regional organic standard. The South African draft standard, SANS 1369 (see section 4.4 below for further information), has been based on the IFOAM framework and the EU standards, and makes reference to the Codex guidelines (INR, 2008; SABS, 2012).

A product may be advertised as 'organic' if it complies with the organic standard set in the respective country. However, the complexity increases when products are being sold internationally, i.e. when a national standard is not equivalent to the one of the export market, or when a certification body does not adhere to ISO 65 (17065) guidelines, or when a country has not established a standard for organic production. While national organic standards may conflict with the standard of the export market, they provide a basis for trade negotiation and harmonisation.

As no national organic standard has been adopted in South Africa yet, no products can be certified to a South African organic standard. While 'organic' products are being sold in South Africa upon self-declaration of the producer, they may not be exported as 'organic' as long as they do not meet the standard of the import market. For instance, the EU only allows South African products to be exported and sold as 'organic' if they are certified to a standard equivalent to the EU regulation (INR, 2008; FAO, 2012). As the EU is an attractive export market for organic products, many producers and processors outside of the EU decide to become certified according to the EU regulation. Even beyond EU borders, the EU organic label is recognised and appreciated by consumers. It should be noted that, in 2012, the European Commission (EC) decided to review the current legislative and political framework for organic farming. In March 2014, the Commission published a legislative proposal for a new regulation that would result in a complete revision of the legislation. Most of the actors in the organic sector and many Member States rejected the EC proposal, arguing that it would hamper the sustainable growth of the European organic sector. As no agreement has been reached, the political discussion are ongoing; experts anticipate that the complete proposal will be exchanged for a revision process based on the existing regulation (IFOAM, 2012b; EC, 2014; IFOAM, 2014b; FiBL 2015).

4.3 Harmonisation and equivalence in organic agriculture

In the context of growing consumer demand for organic products and resulting trade opportunities for developing countries, many national governments are gradually regulating their organic markets, and many organic standards have been developed. While these standards aim to address issues and challenges in the domestic context, they often do not match with the requirements of export markets or take into consideration the conditions in exporting countries, which inhibits trade. Therefore, governments need to engage more in bilateral, regional and multilateral agreements to ensure that different standards do not cause trade distortion and that requirements are harmonised at the aggregate level (USDA, 2002; INR, 2008; FAO, 2012). In other words, products may need to comply with several organic standards and requirements to access foreign markets. The growth in number and variety of organic standards can constrain further organic market development and hamper market access, often to the detriment of smallholders in developing countries. Many producers have to get certification from several markets, thereby incurring considerable costs. Sometimes, the requirements from different destination markets are even conflicting with each other.

Overall, the major import markets for organic products are the EU, the EFTA, the United States, Canada and Japan. All of these markets have strict regimes for the importation of organic products. South Africa would have an opportunity to negotiate market access for organic products through the Trade, Development and Cooperation Agreement (TDCA) or the SADC Economic Partnership Agreement (EPA).

Most importing countries have options to confirm that another country's control system and standards are in line with domestic requirements and that the products certified in those countries can be imported and sold to the national market. Bilateral agreements are mainly political agreements that depend on negotiations between the governments, but are also based on thorough technical assessments. The EU currently recognises eleven countries as being equivalent to its organic system, compiled in the so-called Third Country list (FiBL, 2011a; Willer and Lernoud, 2014; WTO, 2015).

Moreover, the EU has options for recognising certification bodies operating outside of their countries. The technical requirements for achieving such recognition are difficult to meet and come with high expenses. Therefore, maintaining the necessary accreditation requires certification bodies to have substantial financial capacity and personnel. Products are only granted import into the EU if they have been certified by an inspection body or authority recognised by the EC, as the EC publishes a list of approved control bodies and authorities recognised for applying equivalent standards and control schemes outside the EU (See section 5.1.1 for more information). The other major import markets for organic products employ similar guidelines to keep organic imports in scrutiny.

4.4 South Africa's draft organic standard

In South Africa, no standard for organic products has as yet been promulgated. To provide market opportunities, the DTI commissioned the SABS to develop a voluntary organic standard. This process commenced in 2012 but has not been finalised to date. A draft version of the national (voluntary) organic standard (SANS 1369) has been developed by the SABS and circulated for comments multiple times. This proposed standard has been based on EU regulations, and defines the term 'organic' similarly to the Codex Alimentarius Guidelines and IFOAM Norms, namely as management practices that take into account biodiversity, soil biological activity, long-term soil fertility, recycling opportunities, and reliance on renewable resources in locally organised agricultural systems, while minimising all forms of pollution (IDWG/OA, 2007; INR, 2008; FAO, 2012; SABS, 2012; SANAS, 2015).

The draft organic standard covers production and labelling of crops, animal husbandry, products from beekeeping, food processing and handling, as well as inputs influencing, or resulting from, organic production methods. Moreover, the standard covers wild harvesting, group certification, participatory guarantee schemes, and the import and export of organic products. The standard excludes winemaking, aquaculture, game farming, medicinal products, cosmetics and textiles (SABS, 2012).

According to industry experts, the draft standard can be viewed as a modern and progressive standard, and as potentially supportive of the organic agriculture movement as a whole. Arguably, this is apparent from the fact that Participatory Guarantee Schemes (PGS) are allowed for goods produced in South Africa, and the use of the IFOAM Family of Standards for goods certified according to a different approved organic standard (SABS, 2012).

A PGS can be described as a locally focused quality assurance system, which certifies producers based on their active participation. A PGS is established on a foundation of trust, social networks and knowledge exchange, and represents an alternative to third-party certification, developing short-supply chains in mainly informal local markets. It offers an intensified interaction between stakeholders and integrates a capacity-building element that helps farmers to solve their practical problems. It also encourages farmers to take more responsibility and to be more actively involved in the design of production and certification processes (IFOAM, 2011). In other words, PGS is a grassroot system that supports the development of an organic sector through participation and exchange. Considering the high degree of inequality in South Africa as well as the need for a shift towards a green economy, PGS offers an opportunity of a similar sector development path as observed in Europe and North America (IFOAM, 2011). However, a PGS does not have the same strict auditing measures as organic certification. Therefore, a PGS does not qualify for formal international trade with retailers, processors, etc.

However, importantly, no final version of the national organic standard has been accepted and / or published. According to discussions with key stakeholders, the South African Organic Sector Organisation has decided to no longer support the development of SANS 1369, as the multi-year process failed to deliver a standard that satisfies the requirements of both public and private sector. Hence, while the process and characteristics of the draft standard offer important insights and lessons, the development of SANS 1369 is expected to not be pursued further.

4.5 Organic certification: a barrier to trade?

Standards and technical regulations are commonly perceived as barriers to trade, particularly due to compliance costs associated with these regulations, as well as a lack of transparency, questionable scientific evidence and a lack of mutual recognition and equivalence. Many of these measures that have the potential to restrict trade are imposed to mitigate the effects of genuine market failures. Negative externalities that can

arise from unregulated trade may include the damage to local ecosystems as a result of the introduction of pests, or human welfare risks posed by specific additives in processed food products. It may, therefore, be difficult to assess whether a particular policy or measure is a form of market protectionism if the stated aim is to address such negative externalities from import.

However, a system of standards is fundamental to the functioning of global trade. Standards can reduce information asymmetry, protect consumers from unsafe products, and lower consumer search and transaction costs. In order to maintain a balance between necessary standards and regulations to protect consumers on the one hand, and the trade-restrictive potential of these measures on the other hand, Article XX of the General Agreement on Tariffs and Trade (GATT) and two specific WTO agreements – namely, the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and the Agreement on Technical Barriers to Trade (TBT Agreement) – establish distinct disciplines to guide the adoption and implementation of these measures.

According to Article XX of the GATT, governments can enact trade measures to protect human, animal or plant life or health, provided that these measures do not discriminate against member states or are not used as disguised measures of protectionism. Both the SPS and TBT Agreements entered into force on 1 January 1995 as part of the establishment of the WTO. The agreements establish rules regarding the use of human, animal and plant health protection measures, and technical requirements, standards and procedures. Although the SPS and TBT Agreements explicitly recognise the rights of each country to set its own standards, they require domestic standards to be science-based and applied only to the extent necessary to protect human, animal or plant health. Improper use of SPS and TBT measures can create substantial barriers to trade when they amount to disguised protectionist barriers, are not supported by science or are unwarranted.

The international standards relating to food safety can be found in the Codex Alimentarius. These guidelines aim to facilitate the harmonisation of organic product requirements on the international level and assist governments with establishing national organic regulations. However, countries can impose measures that result in higher standards if there is scientific justification on the basis of an appropriate assessment of risk. Developed countries have often been criticised for using SPS measures to restrict agricultural and food product imports to protect their domestic producers. However, developing countries are increasing their use of SPS measures as barriers to trade. This is illustrated by Zambia's current ban on milk exports from Kenya due to stricter domestic requirements for bacterial loads in imported milk, and South Africa's current ban on the importation of non-irradiated honey from Zambia. The SPS Agreement encourages transparency by requiring advance notice of new or changed sanitary and phytosanitary regulations and the establishment of a national enquiry point to ensure access to information.

To rectify the perception that organic certification is a technical barrier to trade aimed at protecting domestic industries, countries should abide by their multilateral commitments. This means that they should ensure that all regulations and technical requirements are notified to the relevant WTO committees and that access to information is provided. However, this might require some technical assistance and capacity building from the international community. Furthermore, dealing with the increasing number of organic regulations and duplicity in certification will require equivalence and mutual recognition mechanisms, as well as harmonisation of organic standards and regulations at the international level. Both these approaches can reduce the negative impact of a multiplicity of standards and conformity assessment procedures. In the long run, the harmonisation of standards and certification requirements will be most beneficial for the flow of imports and exports (IFOAM, 2011).



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5 Green economy assessment of organic agriculture

Facilitating a transition towards more sustainable trade opportunities for South African stakeholders requires an assessment of the broader context. This chapter assesses the economic, social and environmental characteristics of organic agriculture with a view to materialising export opportunities abroad.

5.1 Economic aspects

Case examples show that organic agriculture is a best practice for producing high-quality and healthy agricultural products, while its productivity and efficiency compared to non-organic farming practices depend on a multitude of factors, including, *inter alia*, crop variety, climatic and soil conditions, and the management ability of the farmer. For example, when Padel and Uli (1994) reviewed several studies on costs and returns of organic farming in various crops in Germany, they revealed that organic farming was equally profitable as non-organic farming practices, as lower yields from organic crops were compensated for by reduced costs for inputs and premium prices from organic sales. In comparison, a study from Denmark (Dubgaard, 1994) found that the yield differences were most noticeable for intensive crops such as wheat and potatoes, with organic yields around half the conventional averages. Further, the organic farms used about twice as much labour per hectare as the conventional farms. The study concluded that public support and substantial price premiums on output are essential for the economic viability of organic farming in Denmark. Overall, the challenge of assessing economic efficiency is the factoring in of public goods, such as soil fertility, water quality and climate change. While fundamental to the sustainability and long-term success of any farm, such factors are beyond any general cost calculation conducted at farm level. Moreover, such factors would need to be measured at local or national level, so that appropriate recommendations could be developed. The following subchapters address economic opportunities for consideration.

5.1.1 Export market development

The NEDP (2013) describes South Africa's export culture as "not robust", and this is partially attributed to its political history of apartheid and distance to foreign markets. As a result, many companies were focussed on developing the domestic market, which led to a rather defensive approach of controlling the supply chain and protecting market shares. In today's global environment, however, companies need to be innovative and competitive so that their products or services are not being replaced by imports.

South Africa has adopted an economic growth strategy that supports a stronger domestic manufacturing sector and ensures more competitiveness, but it is lagging in the development of a strong exporter base. An acceptable critical mass of exporters, as NEDP (2013) put forward, would be about 9 to 15 per cent of producers for any sector, in order to improve competitiveness and obtain benefits from trade processes. Most sectors in South Africa are well below this level because of many factors, including the export readiness of companies, key products, markets and promotional activities (NEDP, 2013).

In light of the abovementioned challenges and deficiencies, South Africa has concluded the following two Free Trade Agreements with regional European entities.

- The Trade, Development and Cooperation Agreement (TDCA) between South Africa and the European Union entered into force effectively on 1 May 2004, and the EU offered to liberalise 95 per cent of its duties on products originating from South Africa by 2010. South Africa is also part of the SADC countries which have concluded an Economic Partnership Agreement (EPA) with the EU. This agreement is expected to be signed in May 2016 and come into effect towards the end of the year.
- The Free Trade Agreement (FTA) between the Southern African Customs Union (SACU) – Botswana, Lesotho, Namibia, South Africa and Swaziland – and the European Free Trade Association – consisting of Iceland, Liechtenstein, Norway and Switzerland – entered into force on 1 May 2008. There are tariff reductions on selected goods, such as industrial products (including fish and other marine products) and processed agricultural products. Basic agricultural products are covered by bilateral agreements with individual EFTA States (DTI, n.d.; SARS, n.d.).

The organic food market is constantly growing and offers export opportunities for many developing countries. However, there are significant challenges related to the export of organic products, including a lack of knowledge about export market requirements, consumer preferences and sales channels and markets. Additional challenges arise from the need to adhere to organic standards and to deal with complex and elaborate certification requirements (ITC, n.d.).

Overall, there are many benefits and costs related to exporting organic products. In terms of benefits, an increase in sales and revenue may be most noticeable, which is directly attributable to larger markets with a demand for additional products or services. Moreover, the exposure gained from competing in foreign markets supports the capability of producers to thrive in the domestic market, due to an increased awareness of other products and innovations, as well as different and perhaps more effective sales and marketing techniques, and distribution systems. Moreover, when companies are successful in foreign markets, this results in a greater independence from revenue streams in the domestic market. While benefits from exports often offset the cost, companies need to allocate resources and maintain sophisticated market intelligence (OECD, 2007; Crawford, 1997).

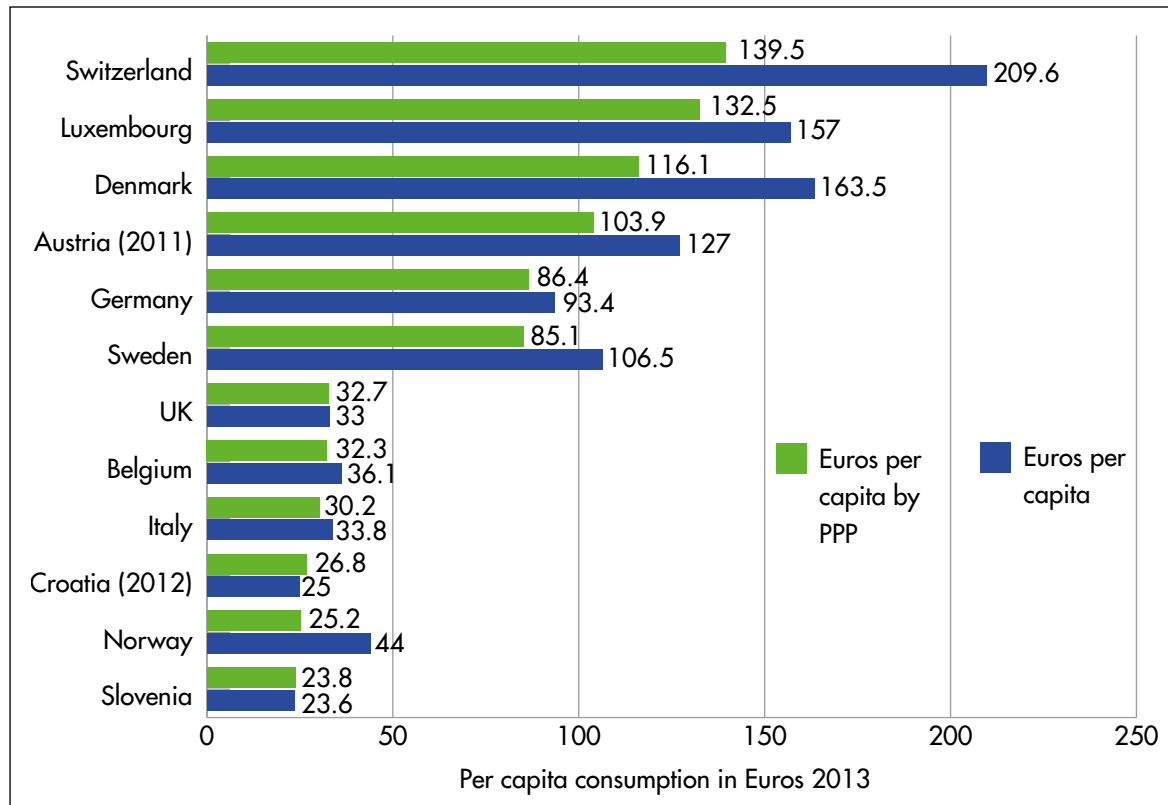
In 2013, global sales of certified organic food and beverage products reached US\$ 72 billion, of which Europe, i.e. EU-28 plus Switzerland, accounted for 43 per cent. As a single market, Europe is equally valuable as the US. For the same year, China released trade data for the first time and accounted for 4 per cent of total retail sales. This figure is expected to grow over the next few years as Chinese consumers become increasingly concerned about health aspects of their nutrition (Willer and Lernoud, 2015; Exporter Guide, 2012; Kearney, 2010).

In 2013, the organic market in Europe increased by 6 per cent. The largest consumer markets were Germany, with a share of 31 per cent of the European market, followed by France (18 per cent), the United Kingdom (9 per cent), Italy (8 per cent), Switzerland (7 per cent), and Austria, Sweden, Spain and Denmark (4 per cent each). This distribution does not correspond to the size of the respective markets. Markets for organic products also experienced continued growth in many European countries, such as Norway (16 per cent in 2013), Sweden and Switzerland (12 per cent each) and France (7 per cent). Moreover, the share of organic in the financial volume of total retail sales indicates the importance of organic products in a particular country. In 2013, the

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organic product sales in Denmark accounted for a share of 8 per cent of total sales, followed by Switzerland (6.9 per cent), Austria (6.5 per cent), Sweden (4.3 per cent) and Germany (3.7 per cent) (Willer and Lernoud, 2015). The organic market value is generally translated into a per capita consumption, to adjust it for purchasing power parity, in order to determine a 'real market value', as per Figure 2 below.

Figure 2: The 12 European countries with the highest per capita consumption of organic products in 2013



Source: Organic Data Network-FIBL-AMI survey 2013 based on national data sources (Willer and Lernoud, 2015).

From a producer's or processor's perspective, it would be valuable to understand more about the distribution of product groups within the organic segment. Although most sales channels treat their data as business secret, some data could be obtained as panel data from general retailers, and figures were verified through personal conversations with general and special retailers across Europe. The following information can be filtered from panel data:

- Organic fruit and vegetables account for about 20 per cent of the organic segment. In Europe, the organic market is dominated by fresh produce and the dominant markets are Italy, Norway, Sweden, Switzerland and Germany. Overall, in Scandinavia and Western Europe, demand for organic products is still growing as consumers relate organic fruit and vegetables to better taste and health (Willer and Lernoud, 2015; CBI, 2015a).
- Organic beverages – mainly wine – generally account for 2 to 6 per cent of the organic segment across Europe. Exceptions are the domestic markets in France and Croatia, where over 10 per cent of beverages are in the overall organic segment. Germany is the world's leading importer of organic wine, with an annual volume of around 30 million bottles, equivalent to 225 thousand hl (Willer and Lernoud, 2015; CBI, 2013).
- Hot beverages, such as tea, coffee and cocoa account for about 3 to 6 per cent of the organic market in Europe. Overall, Europe accounts for around 10 per cent of the total tea consumption worldwide, with the UK, Germany and the Netherlands being the main importing and consuming countries. It is important to note that, while Rooibos and Honeybush are often marketed as tea, in terms of HS Codes they are herbs; hence data might not be as accurate (CBI, 2014; CBI, 2015b; Willer and Lernoud, 2015).

Overall, three different sales channels for organic food prevail in Europe. They range from general to specialised retail, but also include farm stalls, weekly markets or box schemes. Across 15 countries in Europe, supermarkets have a significant share of sales of organic products, ranging from about 30 per cent in Italy to about 80 per cent in Switzerland. While market entry varies between the countries, it is apparent that markets with a strong commitment from retailers have experienced strong growth in sales of organic products. That being said, retailers tend to be generally more price-sensitive compared to special sales channels, which makes them slightly more volatile to an impact induced by external events (Willer and Lernoud, 2015; Regmi and Gehlhar, 2005; WDC, 2000).

In many European countries, demand for organic produce outstrips supply. The reasons are continued market growth combined with an increased demand for varieties of certified organic products. Aside from products that can be grown locally, a range of products has to be imported by definition as they are fresh off-season products, or they do not grow in the climatic region. Examples include tea, coffee or tropical fruit. Overall, the European market is well developed and attractive for exporters from third countries. Once a product has entered the EU, it may be traded freely in all EU member states, provided it has been produced, processed or imported in accordance with the provisions on the organic production method (EC Reg. No. 834/2007). Further, the EC has recognised that some third countries apply production rules and inspection systems equivalent to those applied in the EU. The countries in question, the inspection bodies recognised by these countries, and the respective product categories are set out in Annex III to EC Regulation No. 1235/2008 on the so-called "list of third countries". For countries that are not listed, the EC has drawn up a list of control bodies / control authorities which have demonstrated that in third countries they apply a standard with which established product categories are controlled and certified in a manner equivalent to EU legislation on organic farming. These bodies are set out in the so-called "list of control bodies and control authorities for the purpose of equivalence and specifications" (Annex IV of EC Regulation No. 1235/2008). In 2015, the EC recognised overall eight certification bodies in South Africa, of which not all are operational any longer (Willer and Lernoud, 2014; EC, 2015).

5.1.2 Local market development

In times of increased urbanisation and concerns about food security, organic farming appears to be a valid option for South Africa (Willer and Lernoud, 2015; Kelly and Mekelerkamp, 2015; UNEP and UNCTAD, 2008; Kilcher et al., 2008). Apart from the growth of the organic sector that has been observed in South Africa over the past 15 years, it can be noted that many traditional farmers in rural areas are almost organic by definition, as they are farming with indigenous knowledge and due to capital constraints, the use of technology and artificial inputs range from low to none. Focusing certification efforts on traditional farmers who are already using organic practices by default can provide a cost-effective option.

A recent study conducted by the South African Food Lab (Landman, 2015) evaluated the state of organic agriculture from a smallholder perspective. Key findings include:

- The South African Organic Sector Organisation (SAOSO) plays an important role in shaping the organic industry. SAOSO also has to deal with challenges that result from the dual economy that existed during the apartheid era.
- The South African organic sector has no effective institutional representation. There is neither an organic legislation nor an organic standard in place. References in the Agricultural Products Act are insufficient.
- There is a discord between production, certification and markets in South Africa. Third-party certification options are available for organic farmers who produce mainly for export markets. South African supermarkets barely trade certified organic products, which is partially due to the reduced quantities supplied. Uncertified and PGS-certified smallholder farmers are large in number, but do not have access to formal markets.
- Processing offers a key entry point for anyone wanting to enter the organic sector. However, value-added processing of organic produce also requires a critical mass to justify capital investment. Processes need to comply with international standards, such as the International Food Standard (IFS), the Global GAP, SA8000, or HACCP, depending on the activities and supply chain structure.

The FRIDGE study aimed at developing a value chain strategy for sustainable development and the growth of organic agriculture (INR, 2008). It suggested a number of key elements required to establish an organic

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sector, and developed an action plan for South Africa. The key elements are interlinked, and can be grouped into the following six categories:

- general policies;
- standards and regulations;
- organic markets;
- production;
- training, education and research; and
- regional and international cooperation.

In conclusion, organic agriculture provides an immense business opportunity in both domestic and export markets. Naturally, government and markets should accommodate the interests of business, society and environment, foremost by aligning incentives and pricing for environmental and social externalities (De la Houssaye, 2010).

5.1.3 Employment and value creation

Over the past century, agricultural farming techniques have transformed significantly. Hasty market opportunities, enabled by the increased mechanisation of farm activities, led to a rather short-term thinking over long-term investments. This has contributed to environmental degradation (see Chapter 5.3) and reduced the labour intensity of many farms. A trend of urbanisation can be observed throughout South Africa. Statistics reveal that over the past decade, the agricultural sector has consistently declined as a source of employment, from employing 969,000 people in 2001 to 650,000 people in 2010 (DAFF, 2010). Still, and in spite of contributing not more than 1.9 per cent to national GDP, primary agriculture remains important for the South African economy, as a significant provider of employment, especially in rural areas (DAFF, 2013a).

At the same time, global demand for natural and organic products is increasing, and organic farming has the potential to reverse trends of mechanisation of farm activities and labour drain from rural areas, especially in emerging markets (Willer and Lernoud, 2015). Moreover, as information on sustainable production is more broadly accessible than before, organic farming attracts a new generation of farmers (Ruetzler and Reiter, 2014). Overall, strategies would need to be developed to prevent the rural population from seeking urban employment, or to entice urban dwellers to take up farming.

In 2006, the Soil Association conducted a study of the effects of organic farming in terms of employment creation in the UK (Soil Association, 2006). Even though the UK has a more advanced development status than South Africa, which may blur the cross-applicability of findings, the UK study might serve as the basis for an informed discussion amongst industry and policy-makers in South Africa. The key findings are summarised below.

- **Farm employment compared:** In developed countries, 1 to 2 per cent of the population is employed in farming; in many developing countries, around 60 per cent of the population are subsistence farmers. The large-scale replacement of their labour and livelihoods with agrochemicals and machinery would cause the incremental breakdown of communities, mass migration and urbanisation.
- **Organic is labour intensive:** The system of organic farming requires more labour and, therefore, creates more jobs. Overall, organic farming provides 32 per cent more jobs per farm than equivalent non-organic farms. The main elements of organic agriculture that contribute to higher employment include the smaller farm size and the higher degree of diversity of farming systems.
- **Value added production:** Organic farms are more likely to be involved in on-farm processing, marketing and retailing, building on the trust and direct connection between farmers and consumers of organic food.
- **New farmers:** Organic farming attracts new entrants to agriculture. About 30 per cent of organic farmers had entered agriculture as an entirely new career and did not come from a farming family, compared to 21 per cent of the non-organic sample.

- **Knowledge intensity:** A skilled agricultural workforce is required to enable the transition away from the current fossil fuel-dependent farming, while maintaining food security. Organic farming is an alternative that increases employment, as well as being economically productive and socially and environmentally sustainable.

In terms of employment, retail trade is one of the fastest growing fields, which is partially attributed to its strategic position between producer and consumer (Lockard and Wolf, 2012). In that sense, aside from distributing and trading organic and sustainable products, retail acts as an enabler for a better trading environment, for instance through consumer education. In past decades, retailers have become more aware of the ecosystem they are operating in, and have developed and implemented some sustainability measures (Diamond et al., 2014).

Today, consumption is not only about satisfying needs but also about shaping individual identities, and there is an increased interest in ethics, ecology and social responsibility. Again, retailers play a significant role in this process (Ruetzler and Reiter, 2014; Fredriksson and Fuentes, 2011). Social media channels provide critical information across the globe, thereby changing the way business is conducted. Today, consumers are much more aware of the social and environmental implications of their consumption patterns (Ruetzler and Reiter, 2014; Fredriksson and Fuentes, 2011; Koskela and Vinnar, 2009; UNEP, 2008; UNDESA, 2007).

Over the past two decades, the number of eco-labels has risen significantly, and furthered the demand for sustainably produced products. It is likely that this trend will further contribute to employment creation. As many agricultural products in developed nations are imported from developing countries, organic agriculture is likely to have a positive contribution to the employment challenges faced by many countries.

5.1.4 Product innovation and trademarks

A globalised world provides the opportunity for access to export markets, where offerings might be different in price, quality and technology used. Today, some formerly unrelated industries are interlinked through technology; for example, farming and telecommunication are interlinked through interactive soil moisture sensors that feed back into a central database measuring temperature, wind, etc. This has established new forms of cooperation and different operating models in the agriculture sector (Giner, 2009).

In the South African context, a prominent example of innovative ways of doing agri-business is the retailer Woolworths' concept of Farming for the Future (FFF). In the absence of an organic standard, FFF is a holistic approach that manages the entire farming process systematically. It starts with building and maintaining the soil; as a result, a farm requires less irrigation and a lower chemical input. Furthermore, farmers apply synthetic fertilisers or herbicides only as a last resort, i.e. when their knowledge of alternative measures reaches a limit. While not organic, the approach results in lesser chemical runoff that contributes to better water quality and higher biodiversity (Woolworths, n.d.).

This example illustrates the linkages between innovations (i.e. clearly defined business processes and application of latest technology) and value creation at farm level (i.e. less usage of pesticides and fertilisers for healthier products and environment). Two examples of such innovations include:

- Across the farm, moisture microbes are strategically placed in orchards to continually monitor the available moisture levels for plants. The data is used to determine how much water each planting block needs and how often it needs to be irrigated.
- Pheromones are used to disturb insect behaviour, which leads to lower insect populations on the farm. A group of ducks is being used to work through the orchards and eat all the snails. As a positive side effect, the ducks' manure serves as fertiliser.

Like organic farming practices, these are model innovations that should be encouraged by the government. The innovations have the potential to, inter alia, improve the health of workers, environment and consumers. In general, innovations assist in developing new products, better procedures, and new domestic or international markets. Innovations also benefit from strong domestic rivals and demanding local customers. A challenge related to innovation is uncertainty, as the costs and benefits cannot be defined beforehand. At the same time, it appears to be clear that without innovation, a loss of market share and attractiveness is

Box 5: Organic sales by Coop Switzerland

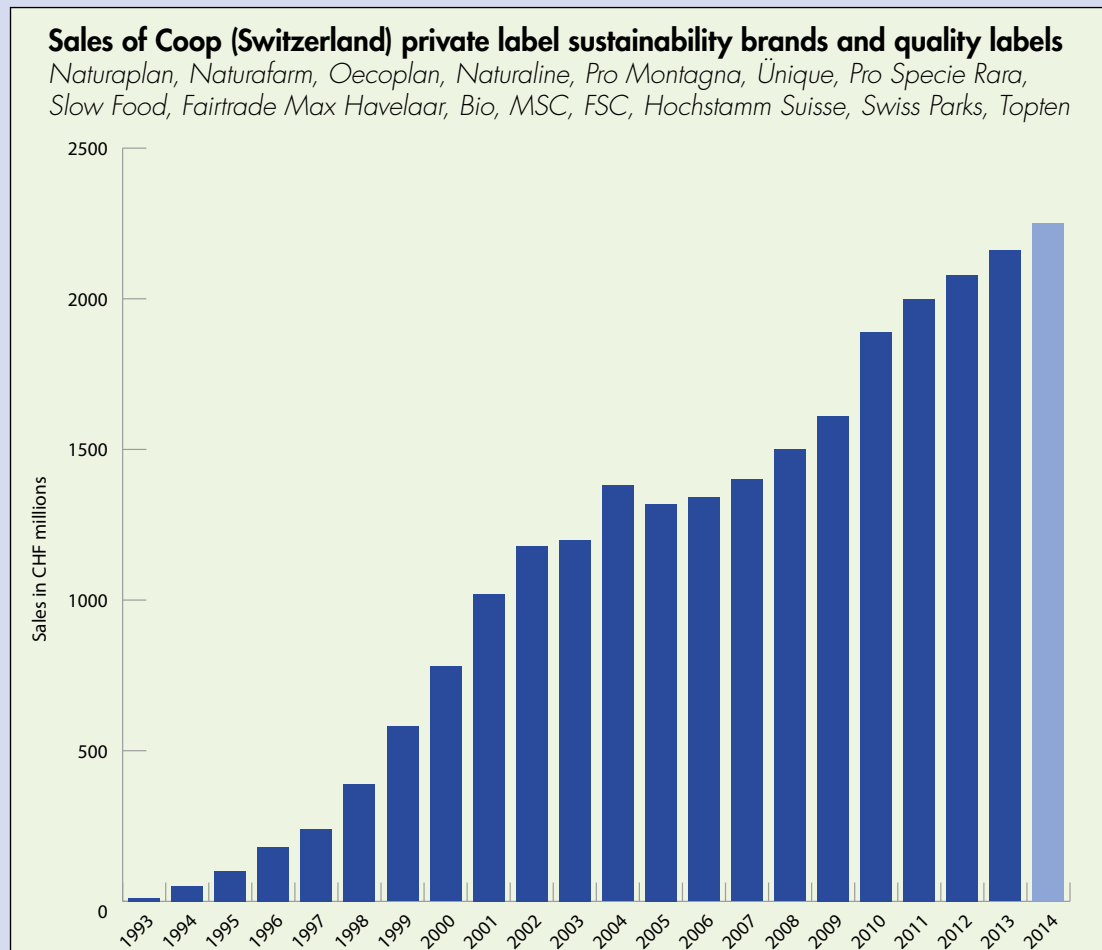


The following example shows that demand for organic produce has been consistently growing in Europe, led by retailers such as Coop Switzerland. Organic supply is currently insufficient to satisfy demand, which means that export opportunities exist for organic producers from South Africa. This situation is not unique to Switzerland. Also in Scandinavian countries, many organic products sell with a price premium of 10–15 per cent. Since South African producers are already exporting wine, fruit and Rooibos tea to Denmark, for example, here lies another potential export market for organic producers.

In Switzerland, retail influenced organic market development. In 1993, there were only 1,405 Bio Suisse certified organic producers. Today, this figure has grown to over 6,000, or 12% of total amount of producers, even though the Bio Suisse guidelines and label requirements are among the strictest in the world. Coop markets organic food products mostly under its own label Naturaplan, which ranges over 1,700 products. Sales of Naturaplan’s organic products surpassed a financial volume of CHF 1.1 billion in 2014, which represented a growth of 2 per cent in comparison with the previous year. The figure below shows the growth of organic sales in Coop Switzerland since 1993.

Unfortunately, South Africa provides only a negligible share of Coop’s organic sales, which is due to lack in supply. Especially for fruit, vegetables, nuts, tea and wine, there are imminent business opportunities for South African suppliers.

Sources: www.coop.ch; www.coop.dk



Source: Coop Sustainability Report, 2014.

almost guaranteed. Therefore, it is important for any government to stimulate an innovation landscape that is incentivised by national or regional policies (Giner, 2009; Porter, 1990).

In the organic sector, trade fairs facilitate innovation processes as they provide an opportunity for businesses to face their international competition and their market. Feedback from both is essential to stimulate progress. Certified organic producers can attend the BioFach trade fair, which is the world's leading trade fair for organic foods and natural products. One of the BioFach highlights is the novelty stand where over 500 product innovations are displayed, which all reflect a mixture of new ideas, the best raw materials, ecological packaging concepts and creative designs (BioFach, 2015).

5.2 Social aspects

This section assesses the social aspects of organic agriculture, as well as its potential contribution to the global food supply as well as food quality. It also provides insight into health aspects of organically produced food. Moreover, it assesses the opportunities for community development that contribute to a social uplifting, especially in rural areas. Organic agriculture has the potential to contribute to employment creation and address occupational health issues that arise from the handling of agrochemicals. Lastly, organic agriculture is a knowledge-intensive farming practice, and as such, it allows for skills development.

5.2.1 Contribution to global food supply

The ability and sufficiency of the current food supply system to feed the human population has been challenged. Advocates of "green-revolution"⁴ methods claim that these are essential for producing adequate food for the growing human population; the methods involve high-yielding plant and animal varieties, synthetic fertilisers and biocides.

Organic farming is widely regarded as a way to feed future populations while mitigating environmental challenges. According to Badgley et al. (2007), organic methods of food production can contribute substantially to feeding the current and future human population on the current agricultural land base while maintaining soil fertility. In fact, the same study suggests that the agricultural land base could eventually even be reduced if organic production methods were employed. However, organic agriculture practices face numerous agronomical, economic and educational challenges.

According to the FAO Inter-departmental Working Group on Organic Agriculture (IDWG/OA, n.d.), the impact of conversion to organic agriculture on yields is as follows.

- In industrial countries, organic systems decrease yields. The range depends on the intensity of external input use before conversion;
- In the Green Revolution areas, conversion to organic agriculture usually leads to almost identical yields; and
- In traditional rain-fed agriculture (with low-input external inputs), organic agriculture has the potential to increase yields.

Besides this broad differentiation, yield differences between organic and conventional agriculture are highly contextual. Organic yields depend on best practices, and organic agriculture performs better under certain agro-ecological conditions. Legumes or perennials on weak-acidic to weak-alkaline soils in rain-fed conditions achieve yields that are only 5 per cent lower than conventional yields. Current organic systems may nearly rival conventional yields with particular crop types, growing conditions and management practices; yet, often they do not. Improving the management techniques or enhancing the agroecological conditions can close the gap between conventional and organic yields (Seufert et al., 2012).

5.2.2 Contribution to food quality – health aspects of organic produce

The demand for organic food is partially driven by the perception of consumers that it is more nutritious than conventional food, and by the concerns over negative environmental and health impacts of agrochemicals. Organic crop production standards prohibit the use of synthetic crop protection products and certain fertilisers.

4 The Green Revolution was a period when the productivity of global agriculture increased drastically as a result of new advances. During this time period, new chemical fertilisers and synthetic herbicides and pesticides were created. The chemical fertilisers made it possible to supply crops with extra nutrients and, therefore, increase yield. The newly developed synthetic herbicides and pesticides controlled weeds, deterred or killed insects, and prevented diseases, which also resulted in higher productivity.

Instead, organic production requires regular inputs of organic fertilisers, the use of legume crops in rotation, and the application of preventative and non-chemical crop protection methods. Apart from minimising the uptake of agrochemicals in crops, organic farming can also affect the mineral uptake patterns and metabolic processes in crop plants. Over the past two decades, numerous studies have been conducted to compare the concentration of nutritionally relevant minerals, toxic metals, pesticide residues, macronutrients and secondary metabolites between organic and conventional crops. It is increasingly discovered that the consumption of organic food will reduce exposure to pesticides and other agrochemical components.

To resolve the inconsistencies between two decades of research, Barański et al. (2014) conducted a review of 343 peer-reviewed publications. The publications that were reviewed indicated that organic crops have a higher antioxidant activity and contain higher concentrations of a variety of nutritionally desirable antioxidants, as well as lower concentration of the potentially harmful toxic metal cadmium and of pesticide residues.

5.2.3 Community development and social uplifting

The aim of organic farming is to create integrated, environmentally and economically viable agricultural systems. Many traditional farming systems in developing countries practice organic techniques without seeking the premium price given to organic food in some export markets. Traditional agriculture includes management practices that have evolved through centuries to create agricultural systems adapted to local environmental and cultural conditions. Organic farming can lead to increased food production, which makes an important contribution to increasing food security in a region. Yields can increase when switching to organic farming in a variety of different contexts, particularly in marginalised areas or in settings where traditional farming methods are used.

Increased household food security is frequently reported after a switch to organic production in African countries, especially since the majority of smallholder farmers grow the bulk of their crops for domestic consumption with only a small proportion for sale. Organic farming is found to increase access to food on several levels. Organic farming also enables new and different groups in a community to get involved in agricultural production and trade where previously they were excluded for financial or cultural reasons. Examples would be organic group certification practices through an internal control system, or community development through a less formal participatory guarantee system. Women play an important role in agriculture, and they are often not able to access synthetic agro-inputs or the credit to buy them. This has historically put them at a disadvantage in agriculture. Financial inclusion in South Africa has improved significantly over the last ten years, but barriers to credit for women are still apparent in some areas, which hinders their ability to start, operate or expand farms or businesses. Barriers include legal constraints, employment and income limitations, attitudes towards women, and lack of information and exposure to business and finance institutions. This has made a large portion of women in South Africa dependent on savings circles, informal arrangements (stokvels), government grants and money lenders (Development Policy Research Unit, 2015). However, organic production evades the need to purchase agro-inputs, which empowers women to farm on an equal level. With the increased number and variety of crops grown and livestock reared in organic production, the farming system is increasingly integrated and resilient to stress, and nutritional security for farmer households is enhanced.

Organic agriculture leads to improvements in social capital, including stronger social organisations at the local level and new rules and norms for managing collective natural resources. Many organic practices inherently focus on social and participatory processes that lead to increased social capital. The creation of cooperatives and marketing groups also helps farmers share knowledge and good practices, divide the costs of organic certification, and meet demands of export companies for large quantities of particular organic produce.

Organic farming also has positive impacts effects on education. Organic systems can increase the amount of food producers per household, which means that families can sell surpluses, often at premium prices. The additional income generated enables families to pay school fees, which increases education levels.

Organic farming can have a positive impact on poverty reduction in various ways. Farmers benefit from cash savings, extra incomes gained by selling surplus produce, and premium prices for certified organic products. Organic farming also involves the use of locally available and appropriate natural inputs rather than purchased synthetic fertilisers and pesticides (UNEP and UNCTAD, 2008).

5.2.4 Labour and occupational health

Organic farming has the potential to contribute to employment creation. On average, organic production requires more hand labour than conventional production, while the labour is often spread more evenly across the growing seasons. For example, some practices result in increased on-farm labour demand by expanding agricultural production seasons. This has the potential to create robust employment and reduce rural unemployment in many areas. Evidence suggests that labour requirements on organic farms are on average 10–20 per cent higher, while labour incomes are similar or even higher than on conventional farms. Many organic farms also involve non-farming activities as micro-businesses, which also forms an important route for new entrants into agriculture. These micro-businesses (processing, retailing and tourism) can develop into significant small and medium-sized enterprises that can act as a growth pole for the rural economy (Lampkin, 2006).

The use of pesticides is a serious health concern for farm workers. Pesticides can contaminate food even when used in accordance with the legal requirements, and they can cause accidents anywhere in the supply chain. Pesticide-related health hazards for farm workers and their families are very substantial, particularly in developing countries. One of the greatest advantages of organic farming today is the protection of farm workers and their families from exposure to pesticides, particularly in developing countries (FAO IDWG/OA, 2007).

5.2.5 Skills development and knowledge transfer

The lack of technical knowledge is often a limiting factor in the spread of organic production. Farming systems become more productive when human capital increases, particularly in the form of the capacity of farmers to innovate and adapt their farming systems. Lack of information on agro-ecology and the necessary skills to manage diverse farming systems can be major barriers to the adoption of organic agriculture.

Organic farming often leads to improvements in human capital, including increased knowledge and skills, and improved capacity of farmers to experiment and solve their own problems. The ability to manage more complex systems requires a higher level of knowledge and skills than is needed to spray pesticides. This increased knowledge of natural pest and predator relationships increases farmers' resilience and capacity to implement changes in times of pest infestation. Organic farming can lead to an increase in education and knowledge on several levels; many organic producers have demonstrated a high commitment to training the youth. Organic agriculture gives incentives to preserve and build upon farmers' traditional and indigenous knowledge of agriculture and local ecosystems.

However, the adoption of these innovative measures is not costless for farmers, often because farmers first have to invest in learning. As current agricultural policies have promoted specialised, non-adaptive systems with lower innovation capacity, farmers have to spend time studying the greater diversity of practices and measures. Lack of information and system management skills can be major barriers to the adoption of organic agriculture. During the transition period, farmers need to experiment and incur the cost of acquiring new knowledge and information. Further, lack of knowledge and information about organic agriculture among government officials and other actors in educational and research institutions require capacity building and training to ensure the realisation of the full potential of organic agriculture as a method to address poverty and food security issues (UNEP and UNCTAD, 2008).

5.3 Environmental aspects

Non-organic farming practices are often described as prioritising high yields over harmonious interaction with the direct environment, and intensified practices often result in environmental deprivation and exploitation, which includes soil erosion, loss of soil fertility, depreciation of water quality, damage to biodiversity, and others (FAO, 2012; FAO, 2002; Singh, 2000). In comparison, organic agriculture uses a customised method to land management, emphasising holistic natural resource management with low inputs and the preservation of natural ecosystems. Thereby, it offers a responsible and sustainable alternative to conventional farming practices, addressing concerns of climate change, environmental and soil degradation, shortage in water resources, and biodiversity loss (Badgley et al., 2007).

This section addresses selected environmental aspects of organic farming practices; it does not aim to be exhaustive. Environmental processes tend to be highly complex, interdependent and dynamic. Yet, highlighting certain environmental elements of organic farming in the context of identifying trade opportunities appears feasible.

5.3.1 Climate change and greenhouse gas emissions

In regards to climate change, the agricultural sector has a dual role, being a key contributor to greenhouse gas (GHG) emissions while demonstrating significant potential for climate change adaptation or mitigation, through both emissions avoidance and carbon sequestration (Lazzerini et al., 2014; Muller, 2009; Barton et al., 2008; IPCC, 2007).

Agriculture is responsible for over 20 per cent of global anthropogenic GHG emissions. The doubling of agricultural production over the past 35 years was associated with an increase in nitrogen fertilisation of almost 700 per cent and phosphorus fertilisation of 350 per cent (OECD, 2001), drastically accelerating climatic change patterns. Climate change poses a significant risk to agricultural communities, particularly in lower latitudes. This risk includes the likely escalation of extreme weather patterns, enlarged water stress, potential droughts, and desertification, as well as adverse health effects for communities (UNDP, 2008). Muller (2009) points out that adverse effects are likely to multiply if adaptation fails, and may aggravate destabilisation and security risks, including loss of livelihoods, malnutrition, forced migration, and conflict.

According to IPCC (2007), Africa is most vulnerable to climate variability and change, because of multiple simultaneous stresses and low adaptive capacity. They point out that, by 2050, between 350 million and 600 million people in Africa are projected to experience increased water stress due to climate change. Moreover, in many African countries and regions, climate variability and change is expected to compromise agricultural production, severely hampering access to food. Therefore, farmers and policy-makers may soon face material challenges. Areas for improvement include the increased use of no-till cropping, agroforestry, and integrated crop and animal farming, as well as a lower use of external inputs in food and agriculture. In addressing these challenges, organic agriculture offers valuable contributions (Greenpeace, 2008; IPCC, 2007).

Some studies comparing emissions from organic vs. non-organic farming practices have been conducted over the past decades. For instance, Küstermann et al. (2008) sampled 81 commercial farms in Germany for emissions of greenhouse gases, like CO₂, CH₄ and N₂O from crop production. They found a direct linear correlation between energy input and greenhouse gas potential. In other words, organic farming consumes less energy per unit area and reaches higher efficiency levels per unit product. Overall, due to energy inputs and greater carbon sequestration as a result of humus restoration, the organic farms revealed that area-related emissions were 2.75 times lower than the emissions from conventional farms.

Lazzerini et al. (2014) conducted a long-term study in Italy comparing organic and non-organic practices in terms of CO₂ emissions and carbon sequestration. They used a simplified analysis method that provided comparable results to the different methodologies reported in the literature. The results showed that when applying a crop rotation scheme, CO₂ emissions from various farm inputs were significantly lower in the organically managed system. In fact, CO₂ emissions were 60 per cent lower than in the non-organic system, of which more than 55 per cent were attributed to the application and production of nitrogen fertilisers, which are not permitted in organic systems (Küstermann et al., 2008; Nemecek et al., 2005; Robertson et al., 2000). At the same time, GHG emissions from fuel consumption and use of machinery are nearly the same in organic and conventional cropping rotations (Küstermann et al., 2008).

Gattinger et al. (2012) proved that both the concentration and the stock of carbon in soils under organic management are significantly higher than in non-organic farming management. Carbon is sequestered through an increase of soil organic matter content, and the stock of sequestered carbon is substantially larger in the organic system than in the non-organic system. Lazzerini et al. (2014) confirm that organic farming positively affects GHG emissions and also soil organic content stock compared to the non-organic farming system. Niggli et al. (2009) add that reducing GHG levels through sequestration in the soil has an even higher potential to mitigate climate change. Therefore, improving soil sequestration of carbon is desirable in both low- and high-yield crop and animal systems.

5.3.2 Food miles

In the agriculture sector, the food chain starts at the farm level. While some products are ready for direct consumption, most products need to be processed or transformed within the manufacturing sector, sometimes even across borders. Ultimately, food is distributed through wholesalers or other transportation activities before consumers purchase the goods from various retail outlets, including supermarkets, retailers, organic or weekly markets, restaurants, and others. In comparison to traditional patterns of localised production and consumption, the food chain today is characterised by longer distances from producer to consumer, and consequently, products bear a higher environmental implication. This concept is described as food miles, where the environmental footprint is measured from farm to fork (EU, 2011; Paxton, 2011).

Food miles represent a multifaceted concept with many considerations, actors, and multiple underlying assumptions towards production, post-harvest treatment, storage, transportation, retail and end consumer behaviour. In many studies, the concept of food miles describes only the GHG emitted from the road, rail, sea and air transport, as data from this segment can be obtained and measured rather reliably.

Other challenges in the food supply chain include time constraints, as well as concerns about storage, waste, fragility, contamination, and packaging requirements. In addition, some products are restricted geographically by climate (e.g. bananas or pineapples), while others are endemic to a particular region (e.g. Rooibos or Honeybush) or have distinct flavour characteristics that create a particular demand (e.g. Pinotage wines). Naturally, most cultivars are only available during certain seasons, and have a growing and harvesting cycle. Yet, demand for most agricultural products exists during the entire year, especially through various formal retail channels that supply growing urban centres across the globe. As apparent from South Africa's agricultural trade profile, markets in the northern hemisphere provide an excellent export opportunity for fresh out-of-season products.

An evaluation of export opportunities for certified organic products needs to account for the environmental impact of trading patterns. Often, groups advocate for buying local as an attempt to strengthen short (local) supply chains (Paxton, 2011). The underlying rationale is that short distances are equivalent to low transport emissions and, therefore, better for the environment; further, short distances foster the development of local value chains. While the development of local value chains has historically supported organic movements in various regions of the world, an analysis of the environmental and food miles aspect lead to results that some people may find surprising. Research shows that, under certain conditions, overseas fruit is less harmful than local produce (Foster et al., 2006; Schlich, 2008). When establishing an energy and emission scorecard, the farm size in most cases plays a much bigger role than the overseas transportation, as the farm size determines the scale of production and, thereby, the marginal environmental impact per unit produced.

In line with the farm size argument, Schlich (2008) found that apples from small farms require five times the energy input when compared to large commercial farms. In practice, farmers with only a few hectares need more energy per apple, mainly because they transport their harvest with smaller vehicles, with higher emissions per kilogram. Moreover, many small-scale farmers do not employ their own cooling facilities, and, therefore, need to transport their fruit to the nearest hub or packhouse. As a general rule of thumb, it was concluded that outputs above 1,000 tonnes of apples correspond to 0.1 kilowatt hours (kWh) per kilogram (kg) of production, whereas less than 200 tonnes of apples correspond to 0.5 kWh per kg. As a potential remedy, it is recommended to form a cooperative when less than 500–600 tonnes of apples are being farmed.

A recent study conducted by the South Africa Fruit & Wine Initiative analysed about 15 per cent of South Africa's table grape industry, in order to understand and reduce the segment's use of fossil energy, and its carbon footprint. From a production perspective, table grape farming is one of the most carbon-intensive industries, due to the high energy inputs. The analysis divided the production into three stages to evaluate the kilograms of CO₂ equivalent per kg of production. The results showed that 53.5 per cent of production-related emissions are directly attributable to farm activities, 35.2 per cent to packhouse, and 11.3 per cent to cold-store activities (CCC, 2013).

When leaving the farm gate, generally, there are four modes of transport available: rail, road, sea or air freight. According to industry reports, the majority of fruit grown in South Africa is exported via sea freight. Sometimes, and especially when the time is critical, smaller quantities are exported via airfreight, for instance, to bridge supply gaps until a container has arrived. As airfreight increases the carbon footprint significantly, several European organic standard-setting organisations have introduced or considered standards based on GHGs emitted during the production or supply of certified organic produce. In Bio-Suisse, for instance, organic produce that uses airfreight may not be marketed as organic in Switzerland. When considering the context and supply chain options available for trade activities, sea freight appears to be the most carbon-efficient. Therefore, there is no reason to label an organically produced fruit from South Africa as 'climate-unfriendly', as long as excess emissions from transportation are offset by emission saved at other production, processing or distribution stages. This holds especially true because sea freight fruit is transported in bulk form (CCC, 2013; Gibbon, 2009; Schlich, 2008).

5.3.3 Agricultural biodiversity

Agricultural biodiversity includes all those components of biological diversity of relevance to food and agriculture that constitute the agricultural ecosystem (FAO, 1999). Agricultural biodiversity is the result of

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interactions between genetic resources, the environment and the management systems and practices used by farmers (Convention on Biological Diversity, decision V/5). The intensification of agricultural practices ranks among the greatest concerns to agricultural biodiversity. Studies in Europe show alarming declines in both ranges and abundance of many species associated with farmland (Hole et al., 2005).

With a growing world population, the necessary area under agricultural cultivation is also increasing. Over the past 300 years, the land needed increased by around 500 per cent (IFOAM, 2006). Where land expansion is not possible, production is often increased through agrochemically intensified farming practices; this has resulted in a shift to an agroecosystem that requires constant human intervention to regulate an internal biological function (Krebs et al., 1999; Altieri, 1999). As a consequence, many countries have experienced a loss in biodiversity, which stimulated public debate over the sustainability of intensive farming practices. Since 1957, this led to many political initiatives and reforms, for example the Common Agricultural Policies (CAP) in Europe. Many citizens in the EU and across the world increasingly require agriculture to respect the environment, decrease impacts on global warming, maintain biodiversity, and support high-quality food products at prices that are fair to both consumers and farmers (EC, 2013; DEFRA, 2001).

Over the past 20 years, inappropriate agricultural practices have contributed to the reduction of available habitat for wild species. Moreover, it has been estimated that the environmental and social effects of pesticide use reach an aggregated cost of about US\$ 8 billion each year (IFOAM, 2006). For instance, the herbicide glyphosate and the insecticides malathion and diazinon were recently classified as probably carcinogenic, leading to a ban on the products in many countries, such as the Netherlands and France (IARC, 2015). Furthermore, a study from the European Academies' Science Advisory Council found that neonicotinoid insecticides have a devastating effect on biodiversity, especially honeybees (EASAC, 2015). Overall, unsustainable practices have created uncertainties about biodiversity, water availability and pollution, soil fertility and erosion, as well as issues around food safety (DEFRA, 2002).

At the same time, research into organic agriculture practices has shown that organic farming systems maintain higher degrees of biodiversity than non-organic farming practices (FiBL, 2011b; Mäder et al., 2002). Depending on various factors, such as geographical location, rainfall and altitude, organic farming usually enhances species richness and diversity, most notably of plants, birds and predatory insects (Hole et al., 2005). Bengtsson et al. (2005) conducted a meta-analysis of 66 publications comparing organic and non-organic farming systems. They evaluated whether organic agricultural practices would increase species richness and whether this would increase the abundance of organisms; they found that, on average, organic agricultural practices increase species richness by 30 per cent compared with non-organic practices. Moreover, soil organisms are generally more abundant in organic agriculture systems, and bird species more common on farms under organic management, leading to an overall 50 per cent increase in biodiversity.

Moreover, when farm comparisons were conducted in Switzerland and England, research showed that semi-natural areas are larger on organic farms than on non-organic farms (Schader et al., 2008; Gibson et al., 2007). Semi-natural areas on farms make an essential contribution to maintaining biodiversity, because hedges, meadows and scrubs serve as habitat and as a temporary retreat for many animal species. The study from Switzerland (Schader et al., 2008) found that organic farms apply about 66 per cent more measures to support biodiversity than non-organic farms.

Generally, a higher biodiversity is beneficial to farmers as it serves the natural agroecosystem effectively. Also, a larger amount of species contributes to better adaptation to environmental events, such as soil erosion or droughts. Organic farming supports biodiversity through:

- Increased pollination as well as an increased number and variety of wild species;
- Maintenance of healthy soils and soil fauna, such as earthworms;
- A reduced risk of water pollution and soil erosion;
- Natural pest reduction in soil and crops; and
- Higher levels of agrobiodiversity (FiBL, 2011b; Gabriel and Tschardt, 2007; IFOAM, 2006; Siegrist et al., 2007; Klingen et al., 2002).

The effects of organic farming on biodiversity and species richness will be larger in intensively managed agricultural landscapes than in diverse landscapes. The South African agricultural sector comprises of larger commercial farmers; hence, organic farming practices are expected to benefit biodiversity. Moreover, sustainability is also fostered through the formation of farming cooperatives, or the establishment of larger organic farming areas (Rahmann, 2011; FiBL, 2011b; Bengtsson et al., 2005).

5.3.4 Water resources and quality

In global perspective, agriculture is the largest water user. While rain-fed agriculture is the main agricultural production system, irrigation accounts for almost 70 per cent of global water consumption. The projected increase in global agricultural production – mainly due to population growth – will make it increasingly difficult to provide enough water with a satisfactory quality. Without improved systems, agricultural water consumption is expected to increase globally with approximately 20 per cent by 2050. Current food production patterns have a negative impact on the sustainability and quality of water resources. Water-efficient technological advancements often lead to a rebound effect, i.e. instead of leading to lower water consumption, they are often used to enable an increased production (UNESCO, 2014).

South Africa covers an area of 122.3 million ha, and about 13 per cent of the surface area is used for crop production, of which only 22 per cent offers a high production potential. One of the most limiting factors for agriculture is the availability of water, as South Africa faces significant water scarcity. The average annual rainfall is about 495 mm, ranging from less than 100 mm in the western deserts to about 1,200 mm in the eastern part, which is largely below the global average of 860 mm per year. Over 65 per cent of the country does not receive enough rainfall. In 2002, about 1.5 million ha land was under irrigation, but in various areas, the topography prevents successful land development. Still, irrigation for agricultural purposes accounts for almost 60 per cent of total water withdrawal (FAO, 2005; UN, 1997; DWA, n.d.).

To meet South Africa's growing demand for water, surface water resources are well-developed and supply the majority of the urban, industrial and irrigation needs. The inland water resources include 22 major rivers, 165 large dams, more than 4,000 medium and small dams on public and private land, and hundreds of small streams (South African Yearbook, 2013/14). Notwithstanding, a growing population, an expanding economy, low rainfall and high evaporation rates are all contributing to an emerging water crisis in South Africa. Water quality is also declining as a result of increased pollution from industrialisation, urbanisation, and increased mining and agriculture (Ashton et al., 2008).

According to CSIR (2010), South Africa faces five of the six key global threats to freshwater biodiversity, namely water pollution, climate change, destruction or degradation of habitat, flow modification, and invasion by exotic species (i.e. all except for overexploitation). All life is fundamentally dependent on the healthy functioning of aquatic ecosystems. While ecosystems are resistant to a certain degree of adverse impacts, their ability to recover is limited (CSIR, 2010; Darwall et al., 2008; Dudgeon et al., 2006; King et al., 2005).

Classens (2010) argues that the biggest threat to sustainable water supply in South Africa is not a lack of storage, but the contamination of available water resources through pollution. Oberholster (2010) confirms that the water quality problems that South Africa is facing can lead to increased treatment costs, and decrease agricultural yields and quality. Therefore, a lower water quality does not only limit water usability, but also has a negative impact on the economy. Sometimes, for instance, health inspectors have to reject agricultural produce for exceeding Maximum Residue Limits. The main factors contributing to the decline in water quality include salinisation⁵, eutrophication⁶ and acidification⁷.

According to FAO and WWC (2015), "food and water security are inextricably linked [...] and agriculture has to follow the path of sustainability and not of immediate profitability". The pollution of groundwater due to the application of fertilisers and pesticides is a major problem. In organic agriculture, their use is prohibited, and they are replaced by organic fertilisers, for instance, compost, animal manure, or green manure. Well-managed organic systems are better able to retain nutrients, which can significantly reduce the risk of

5 Salinisation is a natural or man-made process that increases the salinity within a water system, and refers to the amount of dissolved inorganic salts in the water, which may result in a reduction of agricultural yield and quality.

6 Eutrophication explains the excessive growth of algae as a result of water enrichment with plant nutrients, particularly nitrogen and phosphate fertilisers, which may negatively impact the functioning of natural aquatic systems. Annual reports indicate that 50 per cent of dams in South Africa are severely affected by eutrophication.

7 Acidification refers to a lowering of the pH level of natural water systems, as induced by humans through, for example, industrial or mining activities. This may result in a mobilisation of heavy metal elements, which accumulates in agricultural produce (South African Yearbook, 2013/14; Battle-Sales, 2010; Oberholster, 2010; Gordon and Enfors, 2008; Muchuwei et al., 2006).

groundwater pollution. In some areas where pollution is a real problem, conversion to organic agriculture is highly encouraged as a restorative measure (IDWG/OA, n.d.).

5.3.5 Soil degradation, erosion and fertility

According to the 68th UN General Assembly, “soils constitute the foundation for agricultural development, essential ecosystem functions and food security and hence are essential to sustaining life on earth”. Moreover, the UN recognised the social and economic importance of healthy land management to, inter alia, enhance sustainable agriculture, protect biodiversity, increase water availability, adapt to climate change, and mitigate land degradation. While these are challenges of global dimension, they particularly hamper the sustainable progress of developing nations (UNGA, 2015).

Over 70 per cent of South Africa’s surface has been affected by soil degradation, which occurs at increasing rates in many communal croplands, grazing lands, and settlements across the country. Although soil erosion is a natural process with different intensities and types, it is accelerated by agricultural practices, such as overgrazing, deep tillage and the lack of crop rotation. An additional issue is soil acidification caused by chemicals used by small-scale and commercial farmers, especially in low-income cropping areas (Decker et al., 2011; Le Roux et al., 2007; DEA, 2006; NDA, 1999).

The mining and fossil fuel industries in Gauteng and Mpumalanga also add to the acidification and pollution of soils. Unfortunately, South Africa is naturally susceptible to degradation and erosion, which is aggravated by limited knowledge about ways to maintain soil structure and fertility (Decker et al., 2011). Across all land-use types, soil degradation occurs more frequently in steeply sloping environments, like in Limpopo, KwaZulu-Natal and the Eastern Cape. The most severe degradation to commercial farming occurs in the Western and Northern Cape. Water and wind flows are the main natural causes of soil degradation; the most frequent degradation of vegetation comprises a loss of plant cover, changes in species compositions, and bush encroachment. Further, soils are increasingly exposed to nutrient depletion, salinisation, contamination and compaction (Kukreja and Meredith, 2011). In essence, under prevailing geological conditions and current farming practices, agriculture in South Africa is unsustainable (Decker et al., 2011; Le Roux et al., 2007; DEA, 2006).

In terms of production efforts and water usage, agriculture is under constant pressure to increase its productivity. The expansion of irrigation due to the growing demand for food will lead to new situations of water scarcity (De Lange, 2010). Methods attempting to stimulate productivity may include the use of increased fertilisation. While this might provide a short-term solution, the application also comes with a risk. In 2007, for instance, fertiliser was imported from China and then used on pineapple farms in the Eastern Cape. Later it was found to contain toxic levels of cadmium, arsenic and lead, which subsequently resulted in an export ban by the EU. Most importantly, synthetic fertilisers may cause environmental damage, as excess usage may dilute into rivers and pollute groundwater. Further, when applied in large single doses, nitrogen is released into the atmosphere as nitrous oxide, a GHG that is 300 times more potent than carbon dioxide (WWF, 2008).

Opting out of synthetic fertilisers and pesticides will lead to a healthy and fertile soil. Crop rotations (including soil-building measures through the use of legumes and small grain mixtures) disrupt weed, insect and disease cycles and thereby maintain soil fertility (Fließbach et al., 2007; Delate, 2000). Organic farming maintains natural resources by incorporating traditional agricultural practices, such as cover cropping, alley farming, the use of animal manure, and the integration of crop and livestock farming, to name a few (Kukreja and Meredith, 2011; Niggli et al., 2009).

In conclusion, the increased productivity of the agricultural sector in South Africa over the past decades has come at a high price, as various hidden costs are not accounted for. Organic farms generally have improved soils and higher degrees of biodiversity, and contribute to building humus and storing carbon. This becomes even more important when considering that soil is effectively a non-renewable resource: to naturally develop 1 cm of topsoil, it takes between 450 and 1000 years (Kukreja and Meredith, 2011; Niggli et al., 2009; Fließbach et al., 2007; Delate, 2000; Pfiffner and Mäder, 1997).

5.4 Cost–benefit analysis of organic production

Sustainability standards and certificates aim to improve the environmental quality, social inclusiveness and economic performance of production and trade. Yet, it is rather difficult to quantify the environmental and social costs and benefits, and to differentiate between private and public costs and benefits. An integrated

framework for measuring the impact of sustainability certification would be crucial in order to inform the strategic decisions of producers and policy-makers, both on investment decisions and on policy formulation and evaluation (UNEP, forthcoming; Victor et al., 2010; D'Amato et al., 2009).

A cost-benefit analysis (CBA) is a systematic process for calculating and comparing benefits and costs of a given decision, based on assigning a monetary value to all the activities performed. Commonly, CBA models focus on economic factors, leaving social and environmental indicators aside, partly due to difficulties of attaching monetary values to them. Commonly, a wide range of techniques is used for an accurate valuation (UNEP, forthcoming; WWF, 2013; MEA, 2005). UNEP (forthcoming) suggests an integrated and systemic approach, using three indicators, to identify the broader costs and benefits of the adherence to sustainability certification and ecolabelling. The model includes a Net Present Value (NPV) analysis methodology that integrates social and environmental costs in monetary terms, which are largely unaccounted for in a conventional CBA. The analytical components are described in the following.

Investment and operating costs

For the private sector, investments refer to those costs associated with a shift towards more sustainable production, including the purchase of machinery or equipment, the transformation of production processes and techniques, and potential additional labour and training costs. Investments also include costs from compliance with sustainability standards, like annual certification fees and management costs related to certification. It is important to note that the shift to sustainable business models generally implies the adoption of a new investment mentality that is focused on long-term profitability and includes environmental, social and ethical dimensions. For the public sector, investments refer to the allocation of financial resources with the aim to create enabling conditions for the development of sustainable businesses, including green funds with marginal interest rates, as well as subsidies and grants for sector development associations, export councils, capacity-building activities and research institutes.

Benefits added

The benefits from a shift to greener production are seldom of short-term nature, and tend to be underestimated in a conventional CBA. Economic, social and environmental benefits from sustainability certification (short-, medium- and long-term) include enhanced access to markets, or the availability of premium prices for certified products, as well as enhanced economic competitiveness and access to global value chains. Hence, trade and market access improvements should be calculated as added benefits of certification, and quantified in monetary terms. Organic agriculture is also more labour-intensive, due to the reduced use of fertilisers and pesticides, as well as more intensive land management, harvesting and post-harvesting processes. Consequently, additional income opportunities are created, as well as opportunities for the establishment of new value chains. Environmental benefits arise from the preservation of natural capital, and also include a wide range of positive externalities towards water management, biodiversity enrichment, soil quality, among others.

Costs avoided

Green production practices and sustainability certification may avoid costs related to the depletion of natural capital and the degradation of ecosystems. For example, reduced fertiliser use will likely decrease groundwater pollution, and thereby lower the cost of water management. Besides, the more sustainable exploitation of natural resources is likely to reduce the social costs associated with environmental degradation, as the many communities depend on natural resources for their livelihood. According to UNEP (2012), three billion people live on small farms, in coastal areas or close to forests, where they directly depend on nature for their nutrition, health, employment and income. Thus, the protection of natural capital and biodiversity assets, including through socially responsible business principles, can safeguard livelihoods and lift people out of poverty.

While it is beyond the scope of this study to provide a detailed CBA of organic agriculture and related exports in South Africa, the following tables provide an overview of relevant valuation indicators that should be assessed for a comprehensive CBA.

Table 2: Organic Agriculture Cost–Benefit Analysis – Suggested valuation indicators

Investment and Operating Cost			
Private Costs		Public Costs	
Capital and Operation & Management Costs	Training Costs	Certification Costs	
Cost of organic pesticides and fertilisers (ZAR/kg; ZAR/ha).	Training of farmers in sustainable agriculture technologies and processes (ZAR/person).	Application fee (ZAR).	Incentives for the purchase of organic inputs (ZAR/kg).
Cost of water- and energy-efficient technology (ZAR/ha).	Training of law enforcement officials (ZAR/person).	Annual renewal fee (ZAR/year).	Incentives for the purchase of organic agriculture technology (ZAR/kg).
Operation and Management Costs (ZAR/ha).		Assessment on annual production or sales fees (ZAR/year).	
Labour costs (ZAR/ha).		Inspection fees (ZAR/year).	
Energy costs (ZAR/ha).			
Water costs (ZAR/ha).			

Compiled from: UNEP (forthcoming). Main references: Afari-Sefa and Gockowski (2010); Nêmes (2009); Pažek and Rosman (2012); UNEP (2012).

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

Compiled from: UNEP (forthcoming). Main references: Blackman and Rivera (2010); Nêmes (2009); Pažek and Rosman (2012); Pretty et al. (2005); UNEP (2012).

Costs avoided				
	Private Economic avoided cost	Public Economic avoided cost	Social Benefits	Environmental Benefits
<i>Direct costs</i>	Reduced use of fertilisers and pesticides (ZAR/year).	Avoided costs of food subsidies, as a result of increased food production and overall well-being (ZAR/year).	Reduced employment and income losses from soil degradation and abandonment (ZAR/year)	Reduced GHG emissions and associated costs (tCO ₂ e/year; ZAR/year).
	Reduced water intensity (ZAR/ton).			
<i>Indirect costs</i>	Reduced productivity losses from soil degradation (ZAR/year).	Reduced costs of ground water purification (ZAR/year).	Reduced health costs as a result of a reduction in diseases related to malnutrition and water pollution (ZAR/year)	Reduced costs of water pollution, e.g. from nitrogen concentration (ug/L; ZAR/year).
			Reduced costs of urbanisation due to rural exodus: lower costs related to urban poverty (ZAR/year)	
Compiled from: UNEP (forthcoming). Main references: Blackman and Rivera (2010); Nêmes (2009); Pažek and Rosman (2012); Pretty et al. (2005); UNEP (2012).				

5.5 Outlook for regional economic schemes

Regional integration is often seen as a factor that can increase stability, wealth and development for various countries simultaneously (Peters-Berries, 2008). Since the establishment of the General Agreement on Tariffs and Trade in 1947, and subsequently the World Trade Organization in 1995, the number of Regional Economic Schemes (RECs) have multiplied. South Africa is a member of the Southern African Customs Union, the SADC, as well as the Tripartite Free Trade Area (T-FTA) and the African Union (AU).

In Europe, the Common Agricultural Policy (CAP) dates back to 1962 and is one of the oldest policies of the EU, strongly rooted in the European integration concept. The CAP has been reformed many times. The first EU regulation for organic food and farming has been established as part of the CAP in 1991. It has been acknowledged that organic agriculture is part of sustainable agricultural development in Europe (EC, n.d.).

In East Africa, the East African Organic Products Standard (EAOS) has been established in 2007 (IFOAM, 2007). It is a uniform set of procedures that regulates the marketing and production of organic products. The East African Organic Mark label ensures towards consumers that produce has been grown in accordance with a standardised production method based on the sustainable management of ecosystems, rather than on the use of artificial fertilisers and pesticides. The East African Standard was developed by a public-private sector partnership supported by the UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development (CBTF), and IFOAM (UNCTAD, 2007).

As a regional leader, South Africa is well-positioned to initiate a joint approach to the development of organic agriculture in the region, including under SACU and SADC. Moreover, a wide range of is technical support is readily available, and includes international donor and non-government organisations, research institutes, as well as the private sector.

Box 6: The Swiss Import Promotion Programme offering trade opportunities for SME's from South Africa



The organic food market in Europe

In Europe, the market for organic food and ingredients is increasing. Especially products which cannot be produced in Europe, like exotic dried fruits, medical plants or essential oils have to be imported and find an attractive market with high demand. Additionally, endemic natural ingredients like the marula tree or rooibos are unique selling points of South African suppliers.

Exporting successfully

However, quality standards and competition in Europe are high. This may pose a barrier for some producers or can prevent them from exporting successfully. The Swiss Business Hub South Africa of Switzerland Global Enterprise, Switzerland's official trade and investment organisation, supports South African suppliers in building a robust export strategy for Swiss and European markets.

Opportunities in cosmetics, pharmaceuticals and F&B sectors

Compared to other continents, Africa has only a small area certified under organic standards. South Africa is no exception to that. However, African and South African products are in demand for cosmetics, pharmaceuticals or food and beverages. A challenge when entering the European market are not only the high-quality standards, but also the high quantities demanded by European partners. A thorough knowledge of the market demands and legal provisions in Europe is essential for South African companies planning to export in the near future.

The SIPPO programme supports SMEs in South Africa

"In general, certification is a key element to have better market access to European buyers. For example, South African suppliers should already be EU-certified as an organic producer and processor. Otherwise it does not make sense to invest a lot of time and money in finding potential business partners", explains Ralph Langholz, Project Manager for Natural Ingredients at Switzerland Global Enterprise (S-GE). The expert on Natural Ingredients Trade in Africa is working on behalf of the SIPPO. The programme provides selected SMEs in partner countries with detailed information on specific industries, conditions and requirements in the Swiss and other European target markets. After a thorough application process, the programme supports participants in finishing the last mile into the European market. It offers coaching sessions on export marketing or quality assurance. The main value of the program is the large network of potential buyers in Europe and Switzerland. SIPPO brings the companies to international trade fairs, like the Biofach Fair in Germany, to meet potential buyers.

Source: www.s-ge.com/switzerland/import/en



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6 Conclusion and Recommendations

Agriculture is not only a supplier of food and nutrition for human and animal consumption, but also provides a range of eco-services. Non-organic agricultural methods contribute to environmental depletion through GHG emissions, degradation of soil fertility and natural water resources, and degeneration of biodiversity and natural habitat for animals and organisms.

Paradoxically, agriculture is inextricably reliant on the resources that it is depleting. Global food security does not only mean to provide nutritious food to all, but also to do so with the smallest possible negative impact on ecosystems and the environment. In other words, sustainable agriculture requires methods that are capable of providing food and nutrition today, without compromising the ability of future generations to meet their needs. Current non-organic agricultural practices fail in combining these two needs, and the global food system needs radical changes to achieve more sustainable farming practices, in order to provide adequate nutrition, contribute to rural development, and provide livelihoods to farmers, without destroying natural habitats.

Organic agriculture is aimed at producing food in an environmentally friendly and socially responsible way. It represents only a small segment of the sector, but it is continuously increasing due to growing public awareness and rising demand for organically produced food. Importantly, the main limiting factor for projected market growth is supply rather than demand.

This final chapter outlines recommendations for the further development of organic agriculture in South Africa, and concludes with pointing to opportunities for further research.

6.1 Organic sector development recommendations

As presented in this study, organic agriculture has several benefits, as it reduces many of the negative impacts of non-organic farming methods, including decreasing crop yields, increased water stress, and land degradation. Also, it contributes to farmers' productivity, reduces their reliance on external inputs, and offers price premiums. Organic agriculture is more knowledge-intensive, which offers an opportunity for

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exchange and community development, and it supports the formation of cooperatives / partnerships, which allows farmers to benefit from each other's experiences. However, international markets require certification, additional skills and labour, which are costly measures that may result in a financing gap.

To develop the organic sector, the active engagement of numerous stakeholders is required, underpinned by robust and systematic assessments of the potential ways in which farming systems can contribute to countering environmental degradation. In this context, the following menu of recommendations is proposed.

- 1. Establish a national organic regulation / standard:** There is a need for a national organic regulation / standard that defines the legally enforceable definitions of organic production. Such regulation / standard needs to specify organic processing practices, and outline the national procedures for organic inspection, certification, and labelling. To avoid confusion and enhance harmonisation, it is suggested to have only one national logo for certified organic products. Further, there is a need for organic guidelines that define farming techniques and permitted inputs. Ideally, the establishment of the organic regulation / standard is combined with a national communication strategy that flags the opportunities from organic practices.
- 2. Contribute to capacity building of organic farming cooperatives:** In developing countries, farming cooperatives contribute significantly to the success of organic agriculture, as they engage in community building, knowledge exchange and capacity building. From a government / operational perspective, farming cooperatives can be supported more effectively than individual farmers, as communication is established with a formal structure. Depending on various local conditions, the best ways to deliver capacity building in South Africa should be identified, which could be a mixture of practical and theoretical courses.
- 3. Facilitate a conversion of non-organic farming systems:** Commercial non-organic farmers need to be encouraged to participate in organic agriculture practices, as they are often considered industry leaders. Many countries / regions that have implemented an organic industry successfully achieved this through financial incentives, such as subsidies, tax reductions, and exemptions. This may include reduced or free certification fees supported by the government or development agencies. In many European countries, the government supported farmers during their conversion period through subsidies or area support payments, which are based on the hectares under conversion.
- 4. Promote the integration and development of organic markets:** Many certified organic farmers and cooperatives lack access to international markets, despite growing demand. Local producers require improved market access to international markets. Access could be facilitated through increased cooperation with international donor or business support agencies, the establishment of an organic export council, primary market research in well-developed markets, visits to international organic trade fairs, and so forth.
- 5. Support the development of domestic organic markets:** As demand for organic produce is growing, it is advised to continue supporting local organic market development, for example through the Organic Farmer Retailer Programme (OFRP) or the establishment of regional / weekly organic markets. Organic products should be affordable to all South Africans, and the establishment of a Participatory Guarantee System represents an opportunity for smallholders to participate in the organic movement. To provide market access, short supply chains should be developed for PGS farmers, for instance, in combination with public procurement where farmers supply neighbouring schools, hospitals, etc.
- 6. Evaluate the polluter-pays principle:** The polluter-pays principle functions under the premise that the costs related to pollution and control measures encourage the rational use of scarce environmental resources and avoid distortions in international trade and investment. However, this principle does not take into account that farmers might not have the necessary knowledge to apply chemicals correctly, and strengthens the idea that more chemicals will always lead to better results. For this reason, it is recommended to revisit the current measures on agrochemicals. Limits could be imposed regarding the quantities of agrochemicals sold in relation to the land size. Buyers and users could also be required to have a qualification from a recognised institution, to make sure that users are fully aware of the environmental and health effects of the product.
- 7. Establish Organic Agricultural Development Zones:** Concentrate on regions in South Africa where organic agriculture has the most potential, or where organic agriculture would be most beneficial in terms of social, environmental or economic challenges. Depending on the crop, these would include regions,

for example, where animal manure or compost are available to provide nutrients for the soil. Further, these could be regions where agricultural labour is readily available, or where non-organic farming practices have created environmental or health problems, so that intervention impacts can be immediately measured. As organic farming is more knowledge-intensive, it would also be beneficial to start with areas where certified organic farms are established already. Further, these zones can host the development of ecotourism activities, and allow for the collection of reliable data that furthers research and stakeholders' understanding of organic farming methods conducive to the geographical conditions in South Africa.

8. **Incentives and support:** Many countries that successfully fostered an organic industry achieved this through financial incentives, such as conversion subsidies or area support payments. However, a conversion to organic agriculture that is exclusively based on higher market prices only provides benefits in the short run and is therefore likely to fail. Studies show that farmers are likely to soon depart the organic farming segment if their initial motivation to join was predominantly attracted by a financial decision. A farmers' long-term commitment is generally built through knowledge and capabilities. Hence, in order to achieve a sustainable impact, incentives for organic production need to be linked to capacity-building measures (Koesling et al., 2012; Harris et al., 2008).

6.2 Opportunities for further research

This study covered many key aspects of organic agriculture in South Africa, and the related trade opportunities. Yet, much further work needs to be done, in terms of research, analysis and capacity building. In light of the policy recommendations provided, the most important further questions appear to be the following ones:

1. What is the actual size of the South African organic industry? In the South African context, which agricultural products are most likely to have a positive impact on organic sector development, when considering both local and export markets, as well as both commercial and small-scale farmers?
2. For South Africa to scale up its organic sector, which kind of incentives / disincentives would be required? What are the implications for the private and public sector? Which type of investments are required and how would they be quantified?
3. Which support mechanisms and capacity-building schemes are needed to facilitate rural communities in adopting organic agriculture practices? What types of support mechanisms are required and which specific conditions need to be addressed?
4. Further research on organic agriculture management practices under tropical / subtropical conditions is required.
5. In order to generate further targeted policy recommendations, it would be useful to assess how the general agriculture, trade, research, education and environment policies of South Africa affect organic agriculture.

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