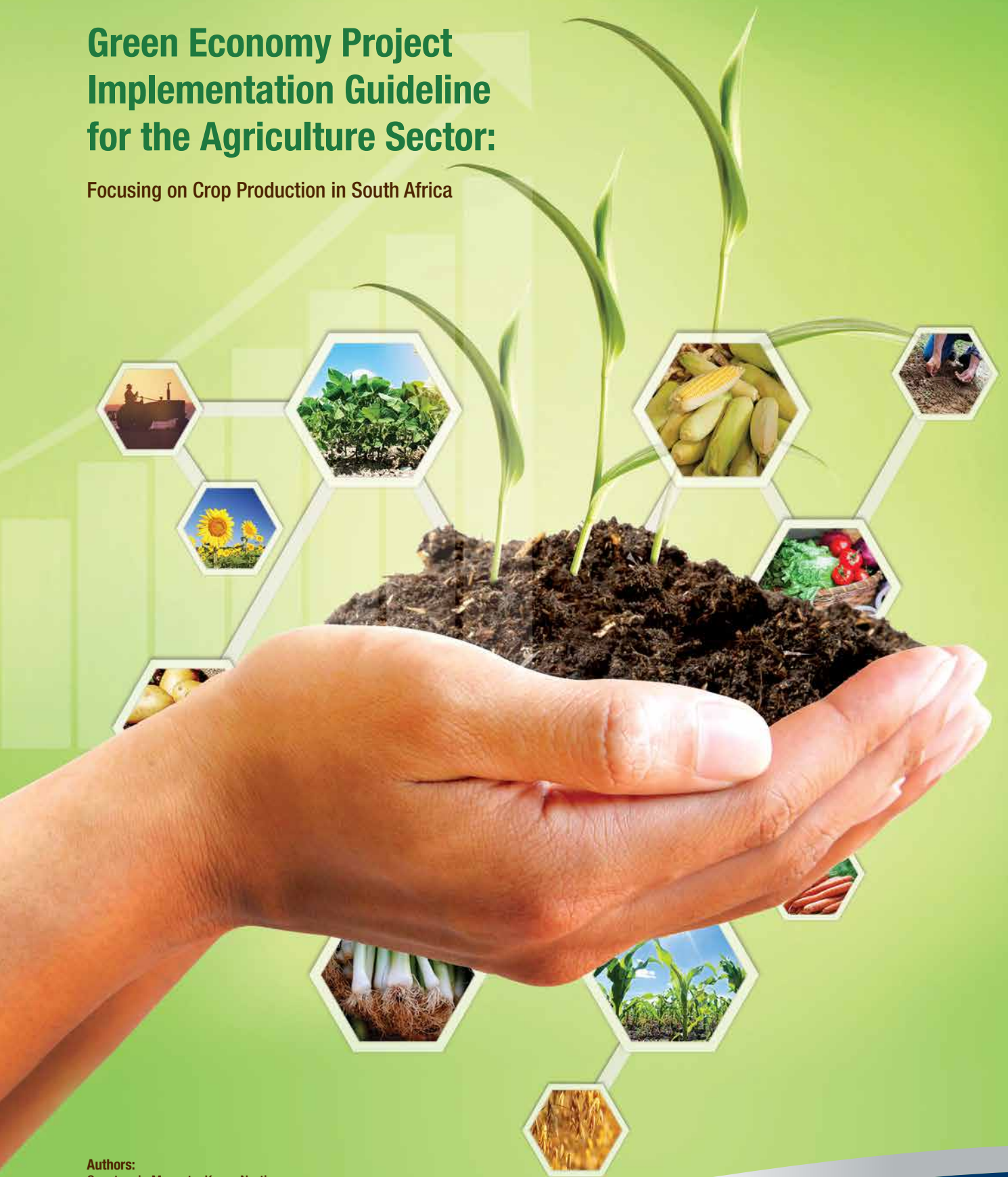


# Green Economy Project Implementation Guideline for the Agriculture Sector:

Focusing on Crop Production in South Africa



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**Acknowledgements:**

The production of this guideline was funded by a Council for Scientific and Industrial Research (CSIR) Parliamentary Grant. We thank the Limpopo Department of Agriculture and Rural Development and farmers in the Tzaneen area for supporting and participating in the research that informed this guideline. The review and comments provided by Dr N. Jovanovic and Ms B. de Wet are gratefully acknowledged.

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# STRUCTURE OF THE GUIDELINE

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South Africa's Green Economy

Why this guideline?

Who is this guideline for?

How the guideline was developed

How to use this guideline

What is a Green Economy?

The role of agriculture in a Green Economy

Agriculture has to be sustainable to be part of the Green Economy

A Green Economy has to address local issues

Green Economy implementation requires a holistic perspective

Translating the Green Economy concept into practice

Characterise the project

Project screening

Green Economy strengths and weaknesses

Adjustments for Green Economy alignment

Characterise the project

Define the project fully

Actions required to achieve success

Monitoring and evaluating project success

Indicators for monitoring and evaluation

Standard 1: Low carbon and environmental protection

Standard 2: Resource efficient

Standard 3: Social equity and inclusivity

Standard 4: Long term economic viability

Standard 5: Rural and local economic development



# PART 1

# 1

## INTRODUCTION TO THE GUIDELINE

PART 1 GIVES SOME BACKGROUND TO THE GUIDELINE AND TO THE CONCEPT OF A GREEN ECONOMY.

### CHAPTER 1:

#### Introduction

South Africa's Green Economy – turning change into opportunity

Purpose of the guideline

Who should use the guideline?

How the guideline was developed

How to use the guideline

### CHAPTER 2:

#### Understanding the Green Economy

What is a Green Economy?

The role of agriculture in a Green Economy

Agriculture has to be sustainable to have a role in a Green Economy

A Green Economy project has to address local issues

Green Economy implementation requires a holistic perspective

Translating the Green Economy concept into practice

# CHAPTER 1: INTRODUCTION

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## 1.1 South Africa's Green Economy – turning a challenge into an opportunity

The world is facing financial, social and environmental problems. Amongst these problems are food, water and energy insecurity. South Africa is not exempt from dealing with these issues, and is also challenged by chronic high unemployment levels, poverty and inequality, environmental degradation and climate change. All of this is happening while the country is struggling to achieve economic growth without degrading the environment and depleting its natural resources. However, these challenges can also be seen as *presenting opportunities for positive change*. The concept of a 'Green Economy' is now being used to help people to think about the potential opportunities that arise from these challenges. South Africa has committed to developing a Green Economy. In simple terms, a Green Economy is an economy that benefits all people without degrading the environment and natural resources. In a Green Economy, natural and other resources are used efficiently and not wasted, and emissions of carbon dioxide (and other greenhouse gases) are kept to a minimum. In a Green Economy, countries strive to improve human well-being and fairness in society, while protecting the environment, and contributing to sustainable development. More information on the Green Economy is given in Chapter 2 of this guideline.

Agriculture has been identified as a key driver of a Green Economy in South Africa and in Africa. Many agricultural activities could provide solutions to the social, economic and environmental challenges that the Green Economy intends to address. Agriculture can provide livelihood and employment opportunities, help to achieve food security; and address rural poverty and unemployment. Depending on farming methods used and the way things are done throughout the whole value chain, agriculture can also contribute to lowering the risk of climate change. However, despite its important role in a Green Economy, agriculture is a primary sector, and it causes land transformation. It is often associated with causing negative impacts on the environment and contributing to climate change through its greenhouse gas emissions. In summary, while there are good opportunities for green economic development through agriculture, at the same time, the sector poses risks to the environment.

Many people have described a 'Green Economy' in theory and much has been written about the concept of a 'Green Economy'. However, there is very little information on how to put the Green Economy into practice and to make it a reality. Getting the agriculture sector to work according to the principles of a Green Economy could be challenging.

Farmers and other role players in the agricultural supply chain, need to meet production targets and other agricultural and enterprise objectives. In addition, to ensure compatibility with the Green Economy, they would also need to balance social, economic and environmental objectives inherent in Green Economy principles. Although agriculture is a well-established sector, the Green Economy is a relatively new and evolving theoretical concept, and there are as yet no project or farm level tools available to assist with implementing a Green Economy in South Africa. *There is therefore a need for tools to facilitate the development and implementation of Green Economy projects in different sectors, including in agriculture.*

## 1.2 Purpose of the guideline

This guideline, produced by the Council for Scientific and Industrial Research (CSIR), can be used to assist in the change to practising agriculture in a way that contributes to green economic growth in South Africa. Establishing a functional Green Economy in South Africa will require fundamental shifts and changes in all sectors of the country's economy. This guideline provides information and support to help users to make the changes, and to be creative in planning and developing agricultural initiatives according to Green Economy principles and the country's Green Economy goals (*See Box 2 in section 2.1*). Also, despite the many conversations that are going on about the transition to a Green Economy, not many stakeholders in the agriculture sector know what is really needed to take a Green Economy approach. The guideline is therefore, also intended to bring this to light, as well as to provide useful and relevant information to support the shift to a Green Economy in the agriculture sector.

There are many farming guidelines available in South Africa, including those published by the national Department of Agriculture, Forestry and Fisheries (DAFF), provincial Departments of Agriculture, the private sector (for example seed and fertiliser companies and agro-processing industries); and organisations such as the Agricultural Research Council (ARC). Examples of such guidelines are listed in Appendix 2 of this document. However, currently there are no guidelines providing information on planning and implementing Green Economy projects in the agriculture sector. There are also no guidelines for optimising agricultural projects to align them with the Green Economy. This guideline is a contribution to closing these gaps. Advice is provided in two parts:

- (i) *Changing ongoing agricultural projects for the Green Economy;* and
- (ii) *Designing and implementing new agricultural Green Economy projects.*

The word ‘project’ as referred to above and as used throughout this guideline refers to activities focused on production of a specific crop. For example, producing a tomato crop would be referred to as ‘a tomato project’ in this guideline. Vegetable production is used as an example throughout the guideline for purposes of illustration, but the guideline is applicable to the production of any type of crop. The guideline can be used for both large and small scale crop production.

### 1.3 Who should use the guideline?

The guideline is intended for:

- Crop farmers and managers of crop production projects who are able to read and understand the guideline;
- Providers of agricultural guidance and support, e.g. agricultural advisory services (both government and private sector) such as the National Department of Agriculture, Forestry and Fisheries (DAFF), provincial departments of agriculture, and Non-Governmental Organisation (NGO) advisory service providers.

### 1.4 How the guideline was developed

International Green Economy principles, South Africa’s Green Economy priorities, the UN Sustainable Development Goals and development priorities; and standard crop production practices, were used to inform the development of the guideline. To develop the guideline, we looked at the generic Green Economy context and agriculture internationally and then specifically at the Green Economy and the agriculture sector in South Africa (see Figure 1.). At the generic level, the analysis covered (i) general Green Economy principles and objectives as described in international literature; and (ii) the agriculture sector and its relationship with the Green Economy. At the country level, the analysis covered South Africa’s Green Economy objectives and priorities as described in the country’s various policies and strategies; and the outcome of a case study of small scale vegetable

production enterprises conducted in Tzaneen Local Municipality, in Limpopo Province. A range of standards were then developed from the insights gained out of the analysis. The standards should be used to guide implementation of crop production focused Green Economy projects in South Africa. They apply to both the design and implementation of new Green Economy projects and the modification or optimisation of ongoing crop production projects for the Green Economy.

### 1.5 How to use the guideline

The guideline can be used in the following ways:

- As a general source of information on aligning agriculture with Green Economy imperatives. Or
- As a reference guide for (i) optimising a crop production project or enterprise to align it with the Green Economy; and (ii) designing and running a new crop production Green Economy project.

In several Appendices at the end of the guideline document, detail is provided on specific aspects of the process of changing a project for the Green Economy or developing a new project for the Green Economy. For example, a sample of questions that should be asked and answered in the process of understanding and assessing an existing project for modification for the Green Economy, is provided in Appendix 1.

We use the term ‘agricultural Green Economy project’ widely in this guideline document. What we mean by this is a project in the agriculture sector that follows Green Economy principles and contributes to the Green Economy.

A glossary of technical terms used in the guideline is included at the end of the guideline document in Appendix 5. The terms that are explained in the glossary are shown in bold typeface wherever they appear for the first time in the text.

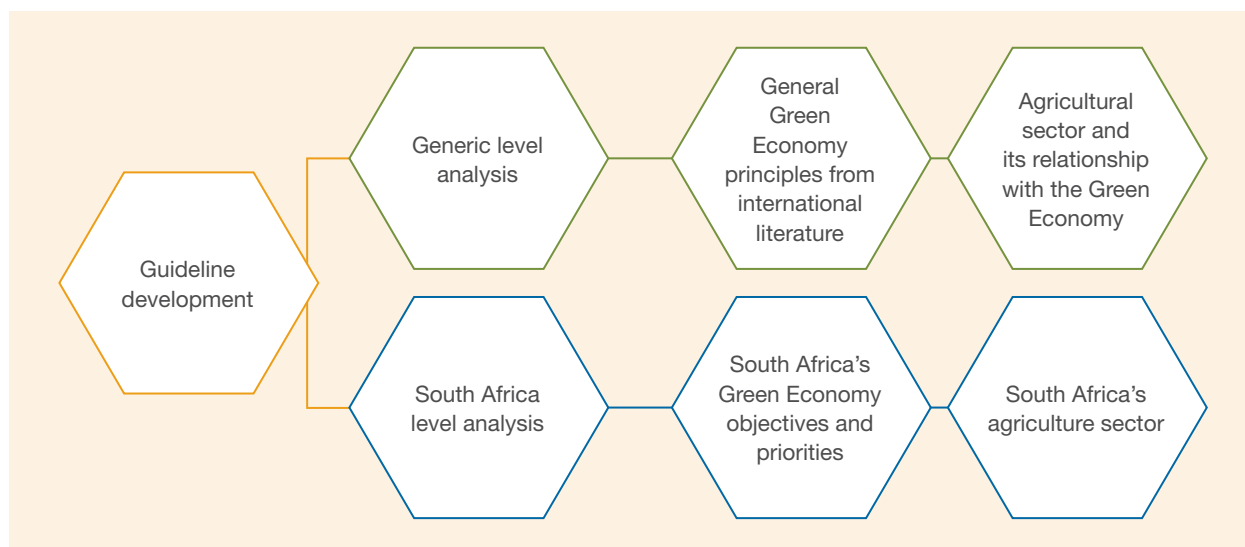


Figure 1. Guideline development process



## CHAPTER 2: UNDERSTANDING THE GREEN ECONOMY

A good understanding of the Green Economy concept and the role of agriculture in such an economy is needed, to successfully implement the Green Economy in the agriculture sector. Based on such an understanding, those involved in project implementation will then be able to adapt the concept and make it work in their particular project or on their particular farm. A brief overview on the Green Economy and agriculture in the context of a Green Economy, is provided in this section of the guideline document. You can find more information in the other sources listed in Appendix 2 of this guideline.

### 2.1 What is a Green Economy?

There are many definitions of the term 'Green Economy'. However, in simple terms, a Green Economy is one that is sensitive to the need to conserve natural resources and minimise damage to the environment, whilst still meeting human needs. Definitions of the term 'Green Economy' include UNEP's definition, which is an economy that "results in improved **human well-being** and social equity, while significantly reducing environmental risks and ecological scarcities"<sup>1</sup>. The Green Economy Coalition<sup>2</sup> on the other hand, defines a Green Economy as "an economy that provides better quality of life for all within the ecological limits of the planet". In Box 1<sup>3</sup> a more in depth definition given by UNEP, provides more insight into the Green Economy.

Given that there are many definitions for 'Green Economy', which could be confusing, it is sometimes easier to understand the concept by looking at its underlying 'principles'. The most commonly mentioned principles of a green economy<sup>4</sup> are listed in Box 2. It is clear from the principles that a Green Economy aims to simultaneously address social, economic and environmental issues, and if correctly implemented, can provide a pathway to sustainable development.

#### Box 1: A Green Economy aims to meet both present and future needs

A Green Economy focuses on improving human wellbeing and reducing social inequity over the long term, while not exposing future generations to significant environmental risks and ecological scarcities. It seeks to do this by increasing investment to ensure that the environment can continue to be used for the benefit of current and future generations; and by basing strategies for economic growth on the sustainable use of natural resources and the environment'. A Green Economy generates the long-term jobs and wealth that are needed to help eradicate poverty.

Source: UNEP, 2011 (b). Towards a Green Economy. Agriculture: investing in natural capital: 548.



1 UNEP 2011: 16 UNEP (United Nations Environment Programme), 2011a. Towards a Green Economy: Pathways to sustainable development and poverty eradication

2 UNDESA, 2012. A Guidebook to the Green Economy. Issue 2: exploring green economy principles. 23 pp.

3 UNEP, 2011 (b). Towards a Green Economy. Agriculture: investing in natural capital: 548.

4 UNDESA, 2012 A Guidebook to the Green Economy. Issue 2: exploring green economy principles. 23 pp.

**Box 2: Principles of a Green Economy**

**Economic**

- The Green Economy recognises natural capital and values;
- The Green Economy should create decent work and green jobs;
- The Green Economy is resource and energy efficient;
- The Green Economy internalises externalities;
- The Green Economy is integrated in economic development and growth models.

**Social**

- The Green Economy is equitable, fair and just – between and within countries and between generations;
- The Green Economy delivers poverty reduction, well-being, livelihoods, social protection and access to essential services;
- The Green Economy improves governance and the rule of law. It is inclusive, democratic, participatory, accountable, transparent and stable;
- The Green Economy uses integrated decision making.

**Environmental**

- The Green Economy invests in and sustains natural resources;
- The Green Economy protects biodiversity and ecosystems;
- The Green Economy recognises and respects planetary boundaries or ecological limits or scarcity.

Source: UNDESA, 2012. A Guidebook to the Green Economy. Issue 2: exploring green economy principles. 23 pp.

**2.2 The role of agriculture in a Green Economy**

Agriculture is the foundation of people’s livelihoods and of economic development in many countries, including in South Africa. The agriculture sector is critical to providing food security, as well as producing energy, fibre and other products. Agriculture contributes significantly to socio-economic growth, employment and poverty reduction, while providing opportunities for empowerment of people in unfavourable circumstances. However, many agricultural practices have also been responsible for causing major environmental problems. For example: the burning of natural vegetation to prepare land for farming, operating agricultural machinery on the farm and in all parts of the value chain, and the fermentation processes in the digestive systems of cattle, emit a large amount of **greenhouse gases (GHG)**, which

contribute to climate change. In addition, large quantities of fresh water are used in agriculture, accounting for 70% of all freshwater withdrawn from aquifers, streams and lakes<sup>5</sup>. Land degradation, including erosion, pollution and salinisation of soil, and other impacts arising from unsustainable agricultural practices has been widely documented, both in South Africa and in other parts of the world<sup>6</sup>.

**2.3 What does agriculture look like in a Green Economy?**

In order for us to understand what agriculture looks like within the context of a Green Economy, we need to focus on three main themes, namely sustainability, looking at things holistically, and addressing local issues.

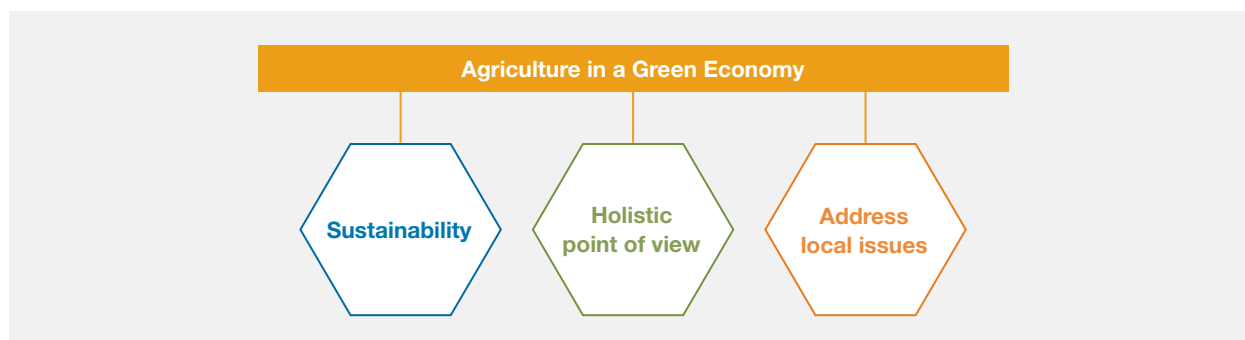


Figure 2. The three important themes that characterise agriculture in a green economy.

5 FAO, 2012. Greening the economy with agriculture. <http://www.fao.org/docrep/015/i2745e/i2745e00.pdf> [accessed 01 July 2014].  
 6 Scotcher, J. S. B., 2009. The Green Choice Living Farms Reference 2009/2010 version. In: Goldblatt, A. (ed.) Unpublished report to Green Choice (a WWF and Conservation International partnership).  
 MA (Millennium Ecosystem Assessment), 2006. Ecosystems and human well-being: Synthesis. Washington: World Resources Institute  
 Meadows, M.E. and Hoffman, M.T. 2002. The nature, extent and causes of land degradation in South Africa: legacy of the past, lessons for the future. *Area* 34 (4), 428-437.



In the following sections we will go into more detail on these three themes.

### Sustainability

For agriculture to contribute to the Green Economy, it is clear that the sector will need to adopt the principles of a Green Economy. But what does this mean in practice? This means that agriculture has to be practised in a way that provides for human needs without damaging the environment and depleting resources. The agriculture sector would have to examine its practices and the way it uses resources and make changes where necessary to minimise its negative impacts on the environment. If agriculture is to be one of the main drivers of a Green Economy, a ‘business as usual’ approach is not an option. Instead, agriculture would have to address both environmental and social issues, by meeting production objectives while still protecting the environment and meeting human needs. This means entails adopting farming methods and practices which fully recognise that agriculture is totally dependent on natural resources and must fulfil many roles, including food production, improving the environment and natural resources; and enhancing the quality of life of people. Such methods and practices contribute to sustainability in agriculture.

**Sustainable agriculture**, with its goal of producing food and other products using farming methods that are economically profitable; and protect the environment, human health and communities; is well aligned with a Green Economy. Furthermore, sustainable agriculture is intended to meet the needs of the present generation without compromising the ability of future generations to also meet their needs, and is therefore compatible with Green Economy principles. For agriculture to have a role in a Green Economy, it be practised in a way that uses all necessary input resources (human, natural, financial) in an efficient and sustainable way. Examples of practices which promote agricultural sustainability include crop rotation and reduced tillage. More information on sustainable agricultural practices is available from various sources including agricultural extension service providers. Also refer to Chapter 7 of this guideline document.

*“Business as usual is not an option...continuing to focus on production alone will undermine our Agricultural capital and leave us with an increasingly degraded and divided planet. If a large part of the world isn’t to go hungry in the 21<sup>st</sup> century, the focus must be on a more rational, ecologically-based use of scarce land and water resources, an equitable trade regime, and widespread recognition and action on climate change.”*

– Prof Bob Watson, Director IAASTD and former chief scientist at the World Bank: March 2008.

### A holistic view

To understand what it takes for an agricultural project to align with, and in so doing, contribute to a Green Economy, a project has to be viewed holistically. All aspects of the project – social, economic and environmental – must therefore be taken into account. A useful tool for fully understanding an agricultural project is a value chain analysis.

A value chain describes the full range of activities required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use<sup>7</sup>.

In the context of assessing a project, a value chain analysis is useful for identifying and understanding the nature and extent of activities associated with the project. To illustrate, the typical value chain for an agricultural project is shown below:

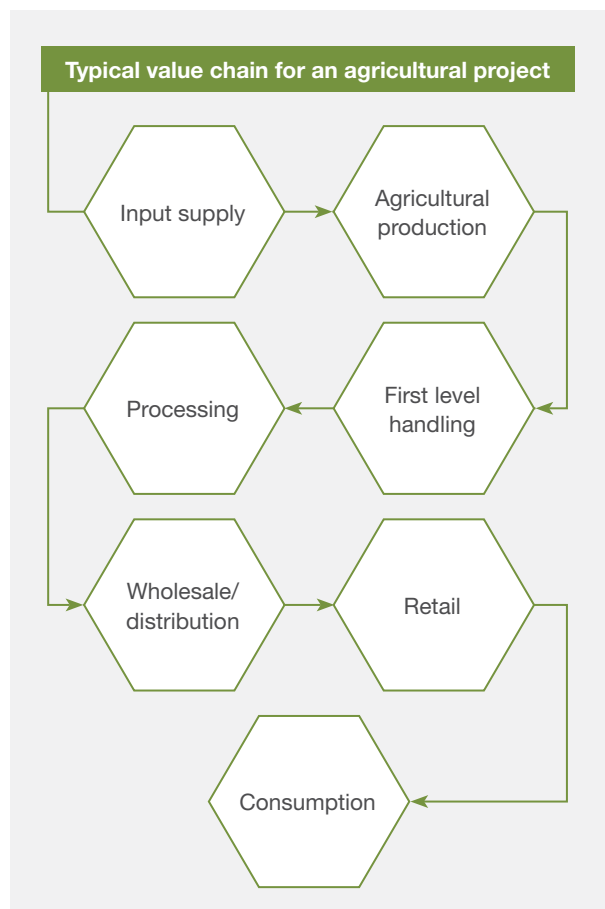


Figure 3. A typical agricultural value chain

7 Kaplinsky, R. and Morris, M. 2001. A Handbook for Value Chain Analysis. Ottawa: International Development Research Centre

For a project to contribute to the Green Economy, the whole process linked to the production of a commodity right up to its sale and consumption has to be aligned with Green Economy principles. It should, however, be noted that in many cases those involved in a single step of the value chain, have virtually no control over what happens in other steps in the value chain. For example, a farmer who is producing a crop, generally has no control over the way inputs are produced and distributed, nor the processing of the crop after it is sold. In such situations, striving to implement Green Economy ideals should be focused on those aspects which are within the control of those working on agricultural production projects. This situation should, however, not dissuade those who aspire to transition to a Green Economy, but illustrates the multidimensional nature of the Green Economy as it relates to agriculture, and the need to take an integrated approach to moving towards a Green Economy.

**Local focus: respond to policy imperatives and the needs of the country**

South Africa’s development goals include addressing poverty, unemployment and inequality and protecting the environment. These goals are stated in strategies such as the National Development Plan<sup>8</sup>; the Green Economy Accord<sup>9</sup>; the National Strategy for Sustainable Development<sup>10</sup>, and others. The goals are focused on the achievement of sustainable development by simultaneously addressing social, economic and environmental issues. They are thus aligned with a Green Economy. Furthermore, the government of South Africa acknowledges the potential role of agriculture, in particular small scale farming in a Green Economy. The role of small scale farming in job creation, addressing poverty and inequality is highlighted. The country’s goals for the agriculture sector include profitable food production, food security, increasing the contribution of the agriculture sector to the country’s economic growth and development; and ensuring protection of the natural resources that are critical for agriculture. These goals are in harmony with Green Economy principles.

There are several policies in South Africa that support practising agriculture in a way that embraces the principles of a Green Economy, for example:

- The National Development Plan (Vision 2030)<sup>11</sup> recommends that “serious attention [be] paid to advances in ecological approaches to sustainable agriculture. This includes greater attention to alternative energy, soil quality, minimum tillage and other forms of conservation farming”;

- The Agricultural Policy Action Plan (APAP) (2015 -2019) is explicit in the commitment to an agro-ecological approach to agriculture (practising agriculture in a way that makes the best use of natural resources while not damaging these resources);
- The Department of Agriculture Forestry and Fisheries (DAFF) Policy on Agriculture in Sustainable Development (8th Draft) is aimed at creating a prosperous agricultural sector while protecting the national biological and physical resource base; and enhancing human health and well-being. The intention of the policy is to facilitate a co-ordinated approach to achieving an ecologically, socially and economically sustainable agricultural sector in South Africa that supports the government’s commitment to poverty alleviation, food security and economic development.

Projects that aim to achieve Green Economy ideals in the agriculture sector (agricultural Green Economy projects) have to align with South Africa’s policies and strategies. They also have to take South Africa’s development priorities into consideration together with Green Economy principles. In addition, issues of specific relevance to the agriculture sector in the country and objectives of those involved in agriculture such as individual farmers should be considered.



8 NPC (National Planning Commission), 2011. National Development Plan: vision for 2030

9 10 EDD (Economic Development Department), 2011. New Growth Path: Accord 4. Green Economy Accord. <http://www.economic.gov.za/communications/publications/green-economy-accord>. [accessed 25 June 2014].

10 DEA (Department of Environmental Affairs), 2011. National Strategy for Sustainable Development and Action Plan (NSSD 1). 2011–2014.

11 NPC (National Planning Commission), 2011. National Development Plan: vision for 2030.NPC, 2011



## 2.4 Translating the Green Economy concept into practice

Implementing a Green Economy project (whether through designing a new project or modifying an existing project) entails considering and addressing many factors. These factors include the Green Economy principles; agricultural sustainability issues and many national Green Economy priorities and aspirations as highlighted above. Furthermore, an individual project would also have its own objectives; for example its production and economic targets. This further increases the factors which should be considered and addressed. At a practical level this means that a project has to consider and translate many different factors into actions. It would be cumbersome to try and consider each of these factors in turn in the process of implementing a project. These factors can, however, be combined into key Green Economy standards for a project.

The standards are *essentially principles or rules that should guide an agricultural Green Economy project*. The standards reflect the social, the economic and the environmental aspects of a Green Economy as captured in Green Economy principles and the other factors that a project has to consider (Figure 4).

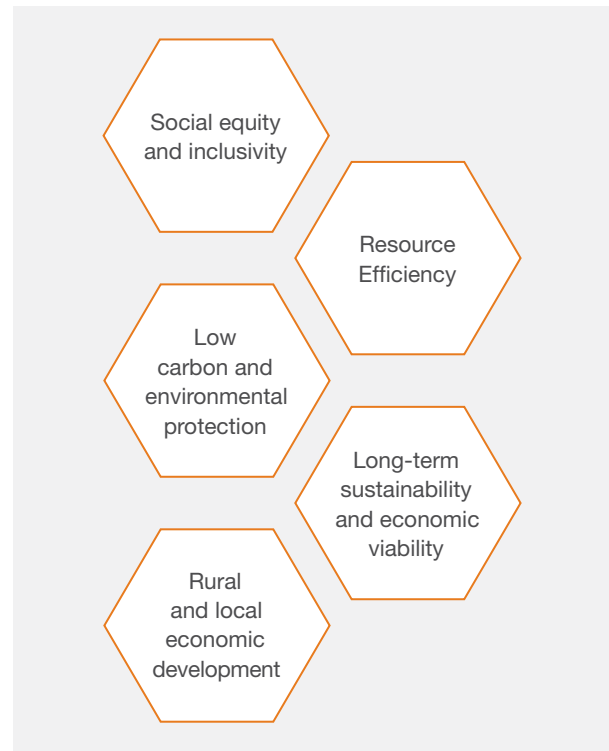


Figure 4. Green economy project standards

Key standards for an agricultural Green Economy project are:

### 1. Low carbon and environmental protection

Given the nature of agriculture as a sector which emits about one third of the global greenhouse gases, one of the standards for a Green Economy project should be minimising greenhouse gas emissions and protecting the environment. It is important to identify all the potential sources of greenhouse gas emissions in a project, e.g. machinery such as tractors and the use of chemical fertilisers and pesticides. It is also important to identify practices and activities which mitigate or result in a reduction in greenhouse gases. Some changes in agricultural practices can result in reduction of greenhouse gas emissions; for example use of renewable energy, such as solar, improvements in soil and nutrient management, and reducing tillage.

More information on how to make farming **low carbon** is available from various sources, and some of these are included in the list of reference materials (Appendix 2 of this guideline). In addition, agricultural Green Economy projects should take special precautions to minimise environmental risks that are associated with the practice of agriculture; such as pollution from fertilisers and pesticides, the degradation of soils through erosion, and the depletion of soil nutrients and soil carbon.

### 2. Resource efficiency

A core standard in a Green Economy project is resource efficiency. An agricultural Green Economy project should use resources efficiently. These resources include water, production inputs such as fertilisers and energy. Linked to resource efficiency is waste minimisation. A Green Economy project should minimise waste e.g. through use of water efficient irrigation methods and strive to recycle resources as much as possible, e.g. using organic waste to make compost which is then used to fertilise soils. The use of practices such as **conservation farming**, which incorporate techniques such as **mulching** and **minimum tillage**, contributes to resource efficiency, for example through water and energy conservation.



Figure 5. Water efficient drip irrigation on a small scale farm

### 3. Social equity and inclusivity

In South Africa, addressing poverty and inequality are Green Economy priorities. Contributing to social equity and inclusivity is therefore a core standard for a Green Economy project in South Africa. A Green Economy project should contribute to addressing poverty and inequality. For example, a project could employ different groups, especially previously disadvantaged people, women, youth and differently abled people. A Green Economy project should strive to create jobs and **decent work**; and this could be done through the choices that are made throughout the project value chain from input procurement right through to the distribution and sale of the products of the project. For example, minimising mechanisation and using labour based methods is one way of maximising job creation. A Green Economy project should not just aim to create jobs, the quality of jobs is important: the jobs created should be safe, i.e. should not harm the environment and people. A Green Economy project should aim to create **green jobs**.

### 4. Long term sustainability and economic viability

An agricultural Green Economy project has to be able to satisfy the human needs for which it is set up, such as production of food on a sustained basis; and it should also be economically viable. Factors such as choice of crop and its suitability for local conditions, production practices and marketing of produce all have a bearing on a project's

sustainability and viability. A Green Economy project should be set up and implemented in a way that optimises these different factors to ensure profitability and sustainability. This standard is critical as it underpins the well-being of farmers and others who derive a livelihood from a project

### 5. Rural and local economic development

In South Africa, rural development and Local Economic Development (LED) are highlighted as priorities in government development plans. Since 1994, government has focused strongly on community and grassroots initiatives and participation. The Green Economy is seen as a tool for rural development. A Green Economy project should therefore not be inward looking, but should strive to contribute to the general development of the local area and to the livelihoods and well-being of local people. Given the limited economic opportunities in rural areas and the fact that agricultural Green Economy projects have a high likelihood of being located in rural areas, contribution to rural development and local economic development is therefore a key standard for an agricultural Green Economy project. Green economy projects have to contribute to addressing the needs of communities in the areas in which they are located. Projects could for example, employ local people and sell some produce to local consumers and traders, thus contributing to local food security.



Figure 6. Job creation is central to a Green Economy



# PART 2

## OPTIMISING EXISTING PROJECTS AND DESIGNING NEW PROJECTS FOR THE GREEN ECONOMY

THIS PART OF THE GUIDELINE PRESENTS TWO GUIDES. THE FIRST GUIDE CONTAINS A DESCRIPTION OF HOW AN EXISTING ENTERPRISE OR FARMING PROJECT CAN BE CHANGED SO THAT IT OPERATES ACCORDING TO GREEN ECONOMY PRINCIPLES. THE SECOND GUIDE CONTAINS ADVICE ON HOW TO DESIGN A NEW ENTERPRISE OR FARMING PROJECT SO THAT IT WILL OPERATE ACCORDING TO GREEN ECONOMY PRINCIPLES.

### CHAPTER 3:

Guide 1 – Changing an existing project for the Green Economy

Characterise the project

Project screening

Green Economy strengths and weaknesses

Adjustments for Green Economy alignment

### CHAPTER 4:

Guide 2 – Designing a new Green Economy project

Characterise the project

Define the project in full

## CHAPTER 3: GUIDE 1 – CHANGING AN EXISTING PROJECT FOR THE GREEN ECONOMY

To fully align with and meet Green Economy requirements, many agricultural projects require some modification. Modifying existing initiatives for the Green Economy is likely to cost less in terms of resource and time investments than starting new initiatives. The main obstacle to changing existing projects for the Green Economy is the lack of directions on how to effect the modifications.

This guide describes a systematic process for evaluating an agricultural project or operation and then using the output of the evaluation to inform action to align the project with the Green Economy. Relevant information and criteria for assessing a project and aligning it with Green Economy principles are provided. While the guide specifically focuses

on crop production as an example, the principles are applicable to agriculture projects in general.

The guide presented here is not intended to be exhaustive, but provides the key pointers for evaluating a project to ensure that key Green Economy issues are not missed. This guide is meant to be used as a reference manual for aligning existing agricultural projects to meet Green Economy requirements. This alignment is a necessary part of a transition to the Green Economy.

The process of changing a project for the Green Economy should be methodological and consistent. The process can be divided into 4 steps as shown in the Figure 7 below.



Figure 7. Process of retrofitting a project for the Green Economy

### 3.1 Step 1: Characterise the project

It is critical to fully understand a project before any attempts at aligning it to the Green Economy are made. The first step of the modification process focuses on getting complete appreciation of a project. The necessity of this step will depend on who the user of the manual is. It would be unnecessary for a farmer to conduct this phase in its entirety, while someone who is not very familiar with a project e.g. an agricultural adviser would need to complete this phase.

In characterising and assessing a project or operation for modification for the Green Economy, **it is important to examine a project holistically and analyse as many aspects as possible**. A useful approach for fully understanding an agricultural project or operation is the value chain analysis. The value chain concept has been covered in chapter 2. For changing a project that focuses on production, the starting point in the value chain is 'agricultural production', and then move backwards to 'input supply' and then to 'first level handling' to follow what happens after a commodity leaves the farm (as shown in Figure 8).

Ideally, each step in the value chain should be subjected to the modification process as described in the following sections of this guide. However, since in most cases farmers and others involved in agricultural production have very little control over what happens to what they produce once it leaves the farm, the other parts of the value chain will not be discussed in this guide.

For users of this guideline who are not directly involved in farming, for example agricultural advisers, understanding of a project should be built through directly collecting information on the project. This is done through a combination of observation and speaking to the key people involved in a project e.g. the farmer or the leader or manager of the project and independent observation. While it may not always be necessary to use a questionnaire to get information from the key people involved in a project, the information gathering

can be done as a discussion. Even if a questionnaire is not used, it is necessary to list the issues that should be covered in project characterisation.

Typical questions that should guide the characterisation process include:

- What is the project about?
- What crops are grown?
- Production methods – is it organic or industrial (conventional) methods?
- Inputs- what inputs are used and what is the source?
- Use of fertilisers and other chemicals – source of these?
- Irrigation – if used type of irrigation?
- What are irrigation decisions based on?
- Equipment used, – tractors – own or hired?
- Markets – where is the produce sold and how does it get to the market?
- Any value addition at the project?
- How many people are employed? How many permanent and how many casual staff?, Number of male, female and young people (35 years of age or younger)?

Appendix 1 provides an indicative list of issues to cover in gathering information on projects.

Observation is another method of building understanding of a project. Observation should be done at the site of a project in order to verify information provided in discussions by the people who are central to the project. The standard observation process should involve a guided tour of the project. The observation should include noting key aspects; including details of crops growing and their general state, workers, equipment in use e.g. irrigation systems and the type, pumping equipment and sources of power and/or fuel. The observation should also include environmental issues such as soil erosion, pollution, recycling, conservation structures and other visible impacts on the environment. The observations should be recorded. A sample observation sheet that could be used directly or adapted is provided in Appendix 3.

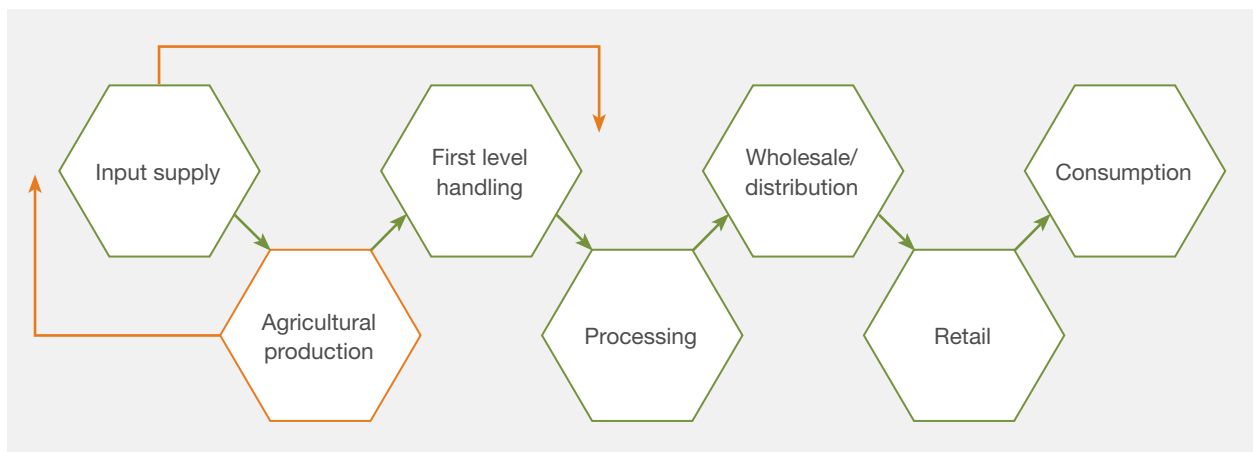


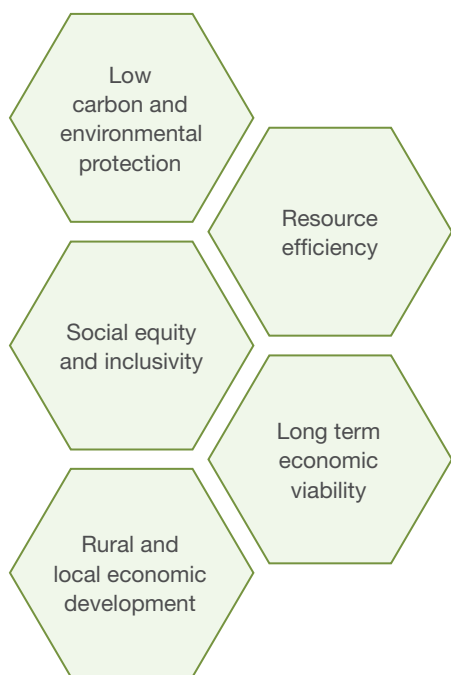
Figure 8. Use of value chain analysis in optimising an existing project for the Green Economy



### 3.2 Step 2: Project screening

After building the profile of a project in Step 1, the second step of the process assesses whether or not the project meets Green Economy project standards (these are described in Chapter 2). For example:

- Does the project address social equity and inclusivity?
- Does the project contribute to economic development, in particular rural and local economic development?
- Does the project use resources efficiently?
- Does the project have in place measures for reducing carbon emissions and protecting the environment?



For each standard, the performance of the project should be recorded. A screening and recording sheet that could be used directly or adapted is shown in Appendix 4. The basis of the screening process is integrating agricultural and Green Economy necessities, bearing in mind that agriculture has a critical role to play in providing livelihoods and food security for a rapidly expanding population, addressing rural poverty, and reducing the risks of climate change. The sector, however, faces challenges in terms of meeting Green Economy imperatives of being resource efficient, low-carbon and socially inclusive. The screening process should be based on a good understanding of the role of agriculture in a Green Economy. The basic information on agriculture in a Green Economy is provided in chapter 2 of this guideline. More information on the Green Economy in the context of agriculture is obtainable from various sources, and a list of potential information sources is provided in Appendix 2.

### 3.3 Step 3: Green economy strengths and weaknesses

In this step of the retrofitting process, the actual Green Economy strengths and weaknesses of a project are identified. This is based on the screening done in Step 2 above. Here it is important to identify and actually list those aspects of the project which are weakly aligned with Green Economy standards but also those aspects of the project which are strong in terms of Green Economy alignment. For each aspect it is important to already note possible ways of improving Green Economy alignment. Potential questions to guide this process are indicated in Figure 9 below.

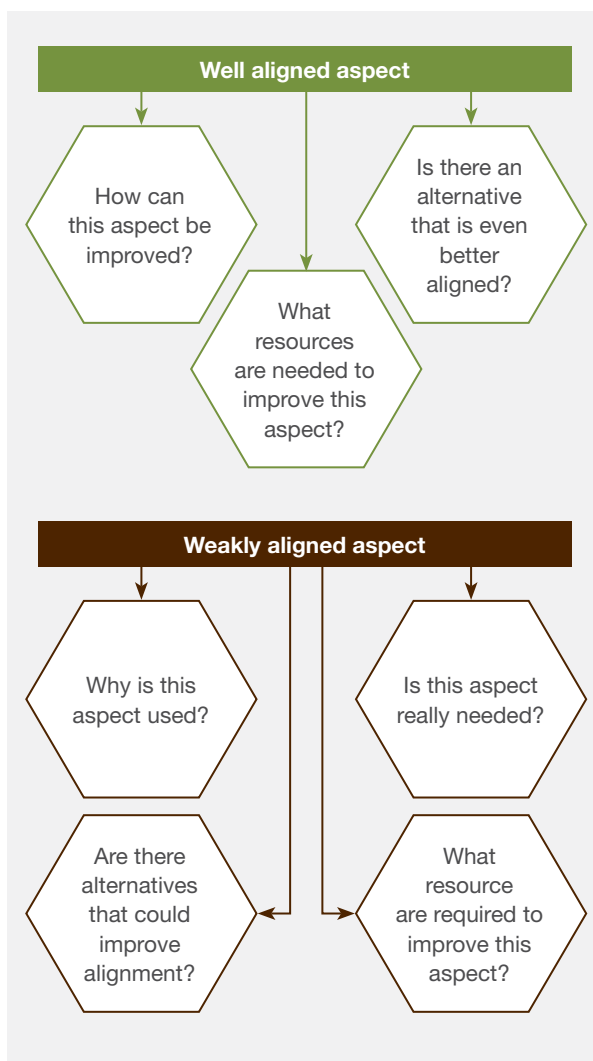


Figure 9. Identifying aspects for improving Green Economy alignment of an agricultural project

### 3.4 Step 4: Adjustments for Green Economy alignment

After identifying a project's Green Economy strengths and weaknesses, it is necessary to identify the adjustments that are necessary to align a project with Green Economy requirements. This is best done by addressing factors listed below in the order shown in the diagram:

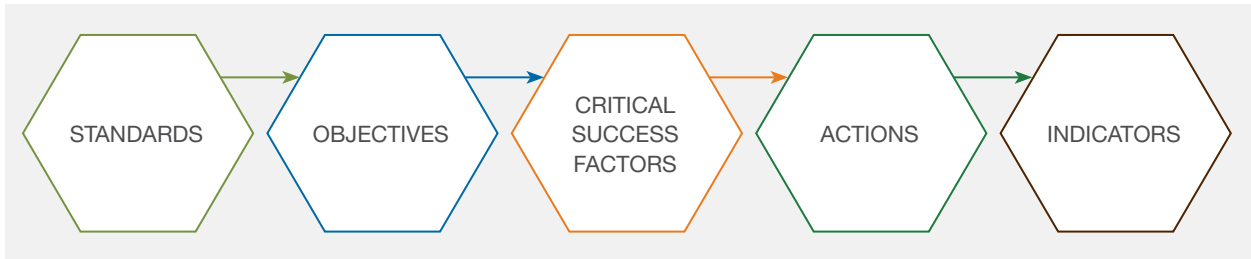


Figure 10. Key factors for aligning a project with the Green Economy

- a) **Standards:** List each of the 5 Green Economy standards as described in Chapter 2
- b) **Objectives:** under each standard, use the Green Economy strengths and weaknesses identified for the project (Step 3 above) to define objectives to improve Green Economy alignment. Examples of potential Green Economy objectives for an ongoing vegetable production project are shown in Figure 11.

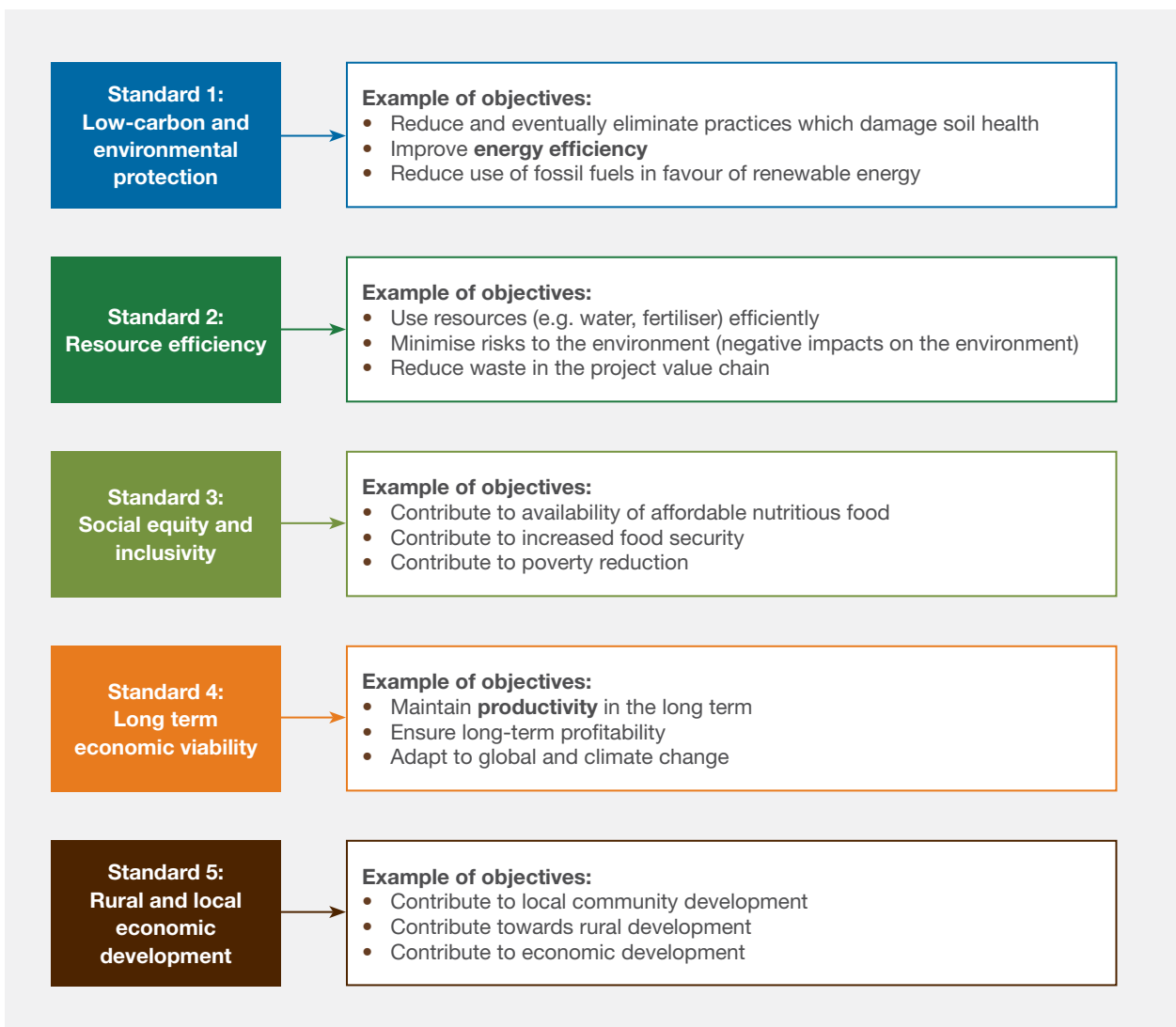


Figure 11. Examples of Green Economy objectives for retrofitting a crop production project for the Green Economy

c) **Critical Success Factors (CSFs):** In order to meet the objectives under each Green Economy standard (as shown in Figure 11), there are a number of factors that will be critical for success; and these are called Critical Success Factors (CSFs). The CSFs for an agricultural Green Economy project are context specific, and help focus efforts and inform key modification and subsequent project management decisions. The CSFs are the areas in which good performance is necessary to ensure attainment of Green Economy standards and agricultural objectives, and should receive constant and careful attention.

In Figures 12a to 12e below, you will find examples of CSFs for each objective. Each diagram is representative of one of the Green Economy standards and also shows the related objectives and CSFs. For the Actions and Indicators associated with each of the standards please refer to Chapter 5 of this guideline.

In the process of changing a project for the Green Economy it is important to note that full alignment of a project with Green Economy standards may only be attainable over time, but a Green Economy project should consistently work towards improving and finally attaining full alignment.

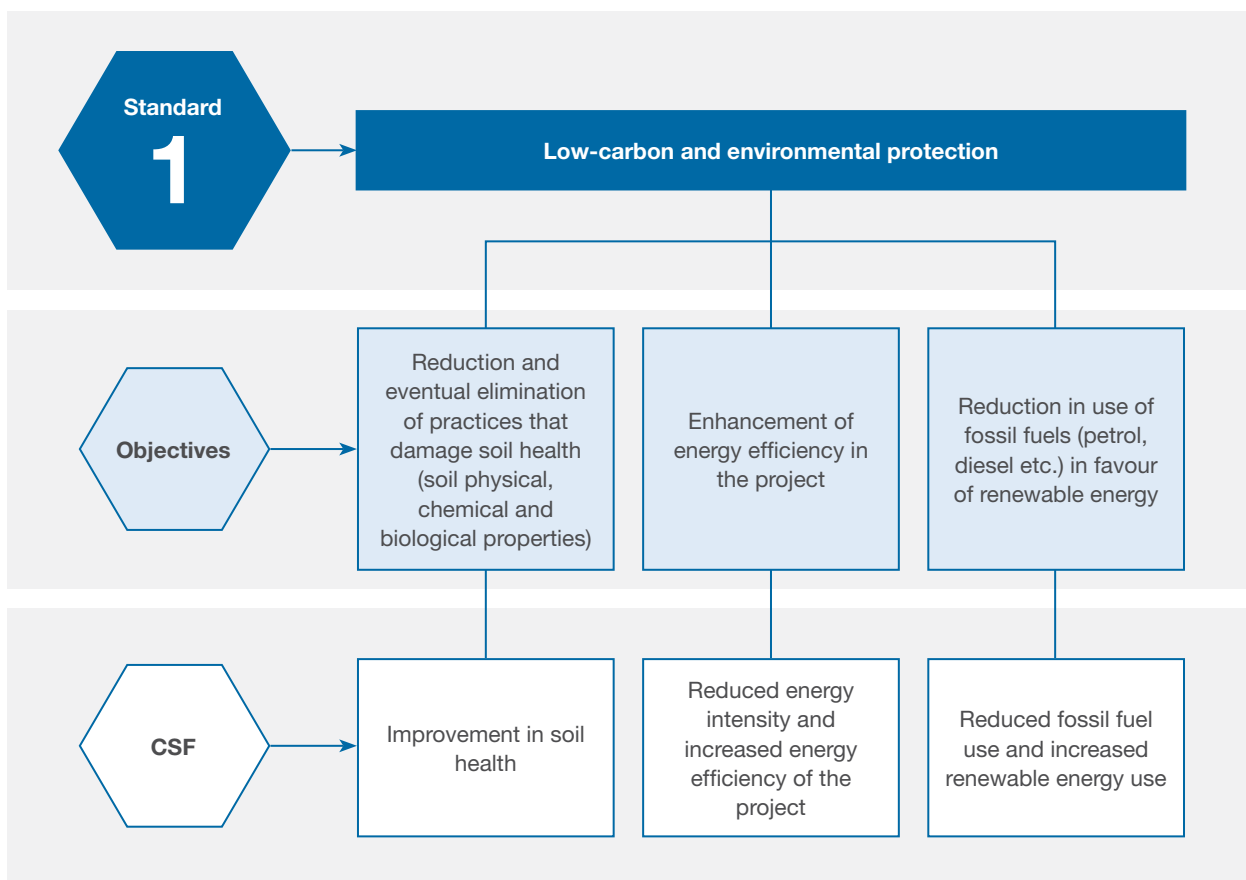


Figure 12a. Critical Success Factors for low carbon and environmental protection in a Green Economy project



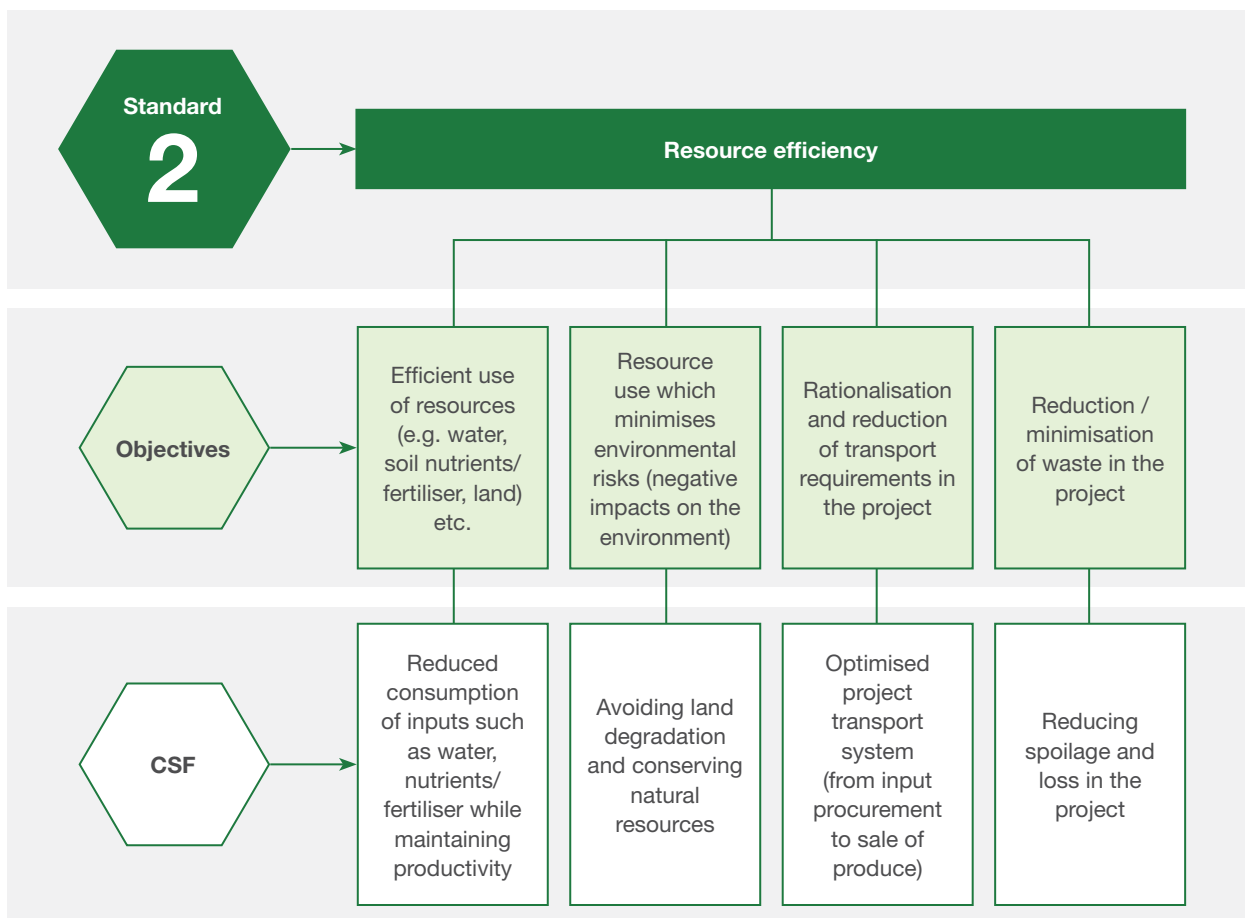


Figure 12b. Critical Success Factors for resource efficiency in a Green Economy project

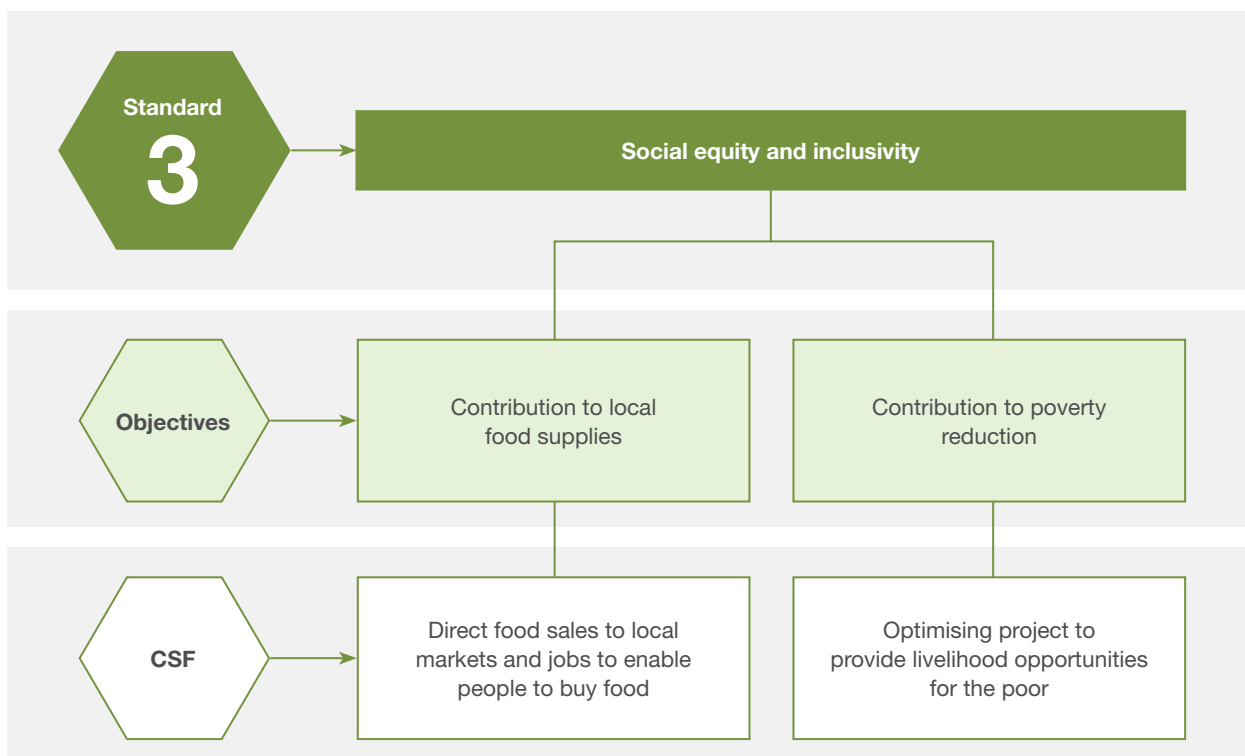


Figure 12c. Critical Success Factors for social equity and inclusivity in a Green Economy project

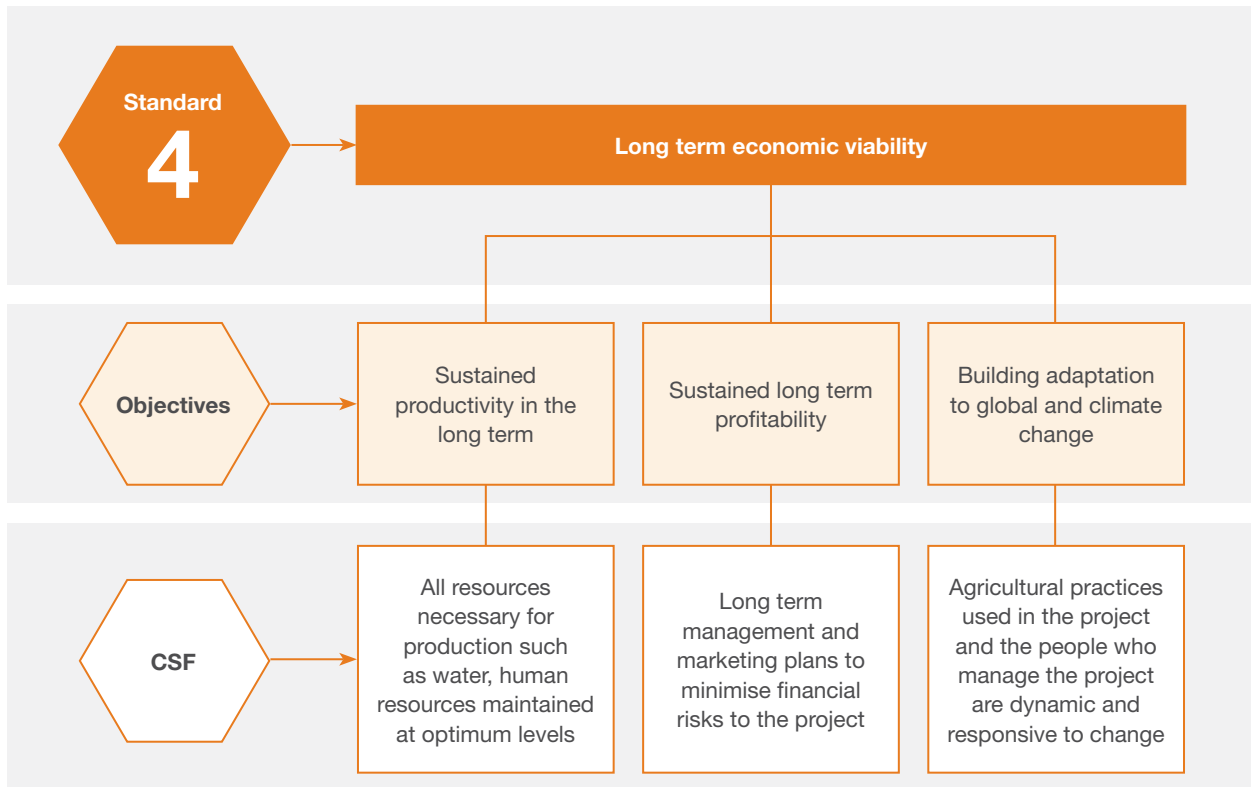


Figure 12d. Critical Success Factors for long term economic viability in a Green Economy project

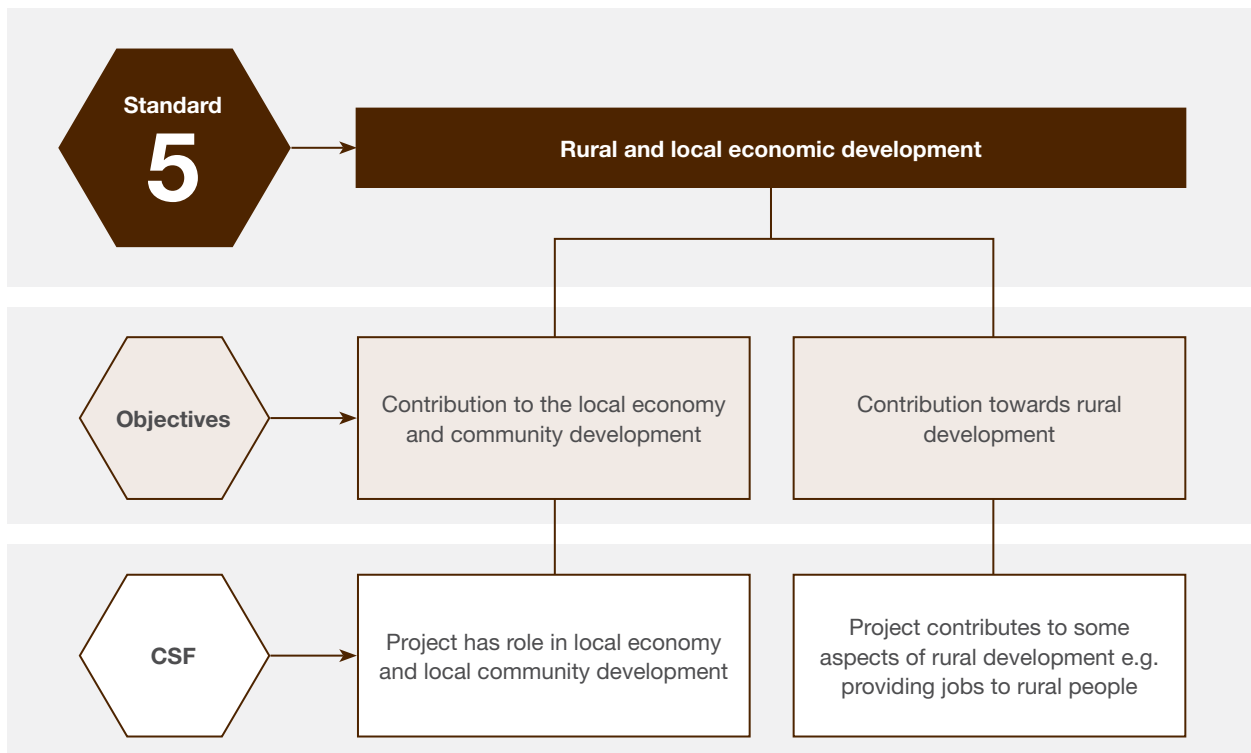


Figure 12e. Critical Success Factors for rural and local economic development in a Green Economy project

## CHAPTER 4: GUIDE 2 – DESIGNING A NEW GREEN ECONOMY PROJECT

Guide 2 is meant to be used as a reference manual for the design of new Green Economy projects. Like Guide 1, this guide also uses the example of a vegetable production project to illustrate how to deal with practical project level issues.

The procedure of designing a Green Economy project is described in the steps listed below:

### 4.1 Step 1: Characterise the project

For an agricultural project to fully contribute to the Green Economy, the whole value chain (that is, the entire process from production of a commodity right up to its sale and consumption has to meet Green Economy standards as discussed in chapter 2 of this guideline. However, due to the fact that in most cases farmers only have complete control of the production part of the value chain, this guide will focus on the production aspects of a Green Economy project. However, if information is available on the other parts of the value chain it should be included. The process of planning a project entails characterising a project accurately. Below are a few key questions one can ask and try to answer and/or get answered as fully as possible. This is critical for placing a project on a Green Economy path from the beginning:

- What is the project about?
- What crops will be grown?
- Production methods – which methods will be used – organic or industrial (conventional) methods?

- Inputs – what inputs will be used and where will these inputs be sourced?
- Will fertilisers and other chemicals be used? Source of these?
- Irrigation – if used what type of irrigation will it be?
- Equipment used e.g. tractors – own or hired?
- Markets – where is the produce going to be sold and how will it be transported to the market?
- Any value addition to produce at the project site?
- How many people will be employed? How many permanent and how many casual staff?
- Number of male, female and young people (35 years of age or younger) employed

Appendix 1 provides an indicative list of issues to cover in the process of fully describing a planned project.



### 4.2 Step 2: Define the project in full

After characterising a project, the process of designing a project should consider the factors shown in Figure 13 below:

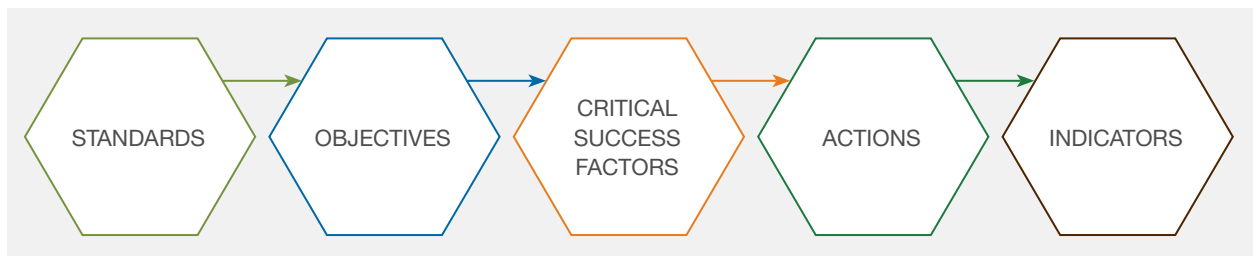


Figure 13. Key factors in the design of a Green Economy project



- a) **Standards:** List the 5 Green Economy standards (as described in Chapter 2) for a project;
- b) **Objectives:** under each standard, define objectives that ensure that the project is aligned with the Green Economy. Examples of objectives for each standard (using the example of a vegetable production project) are shown below:

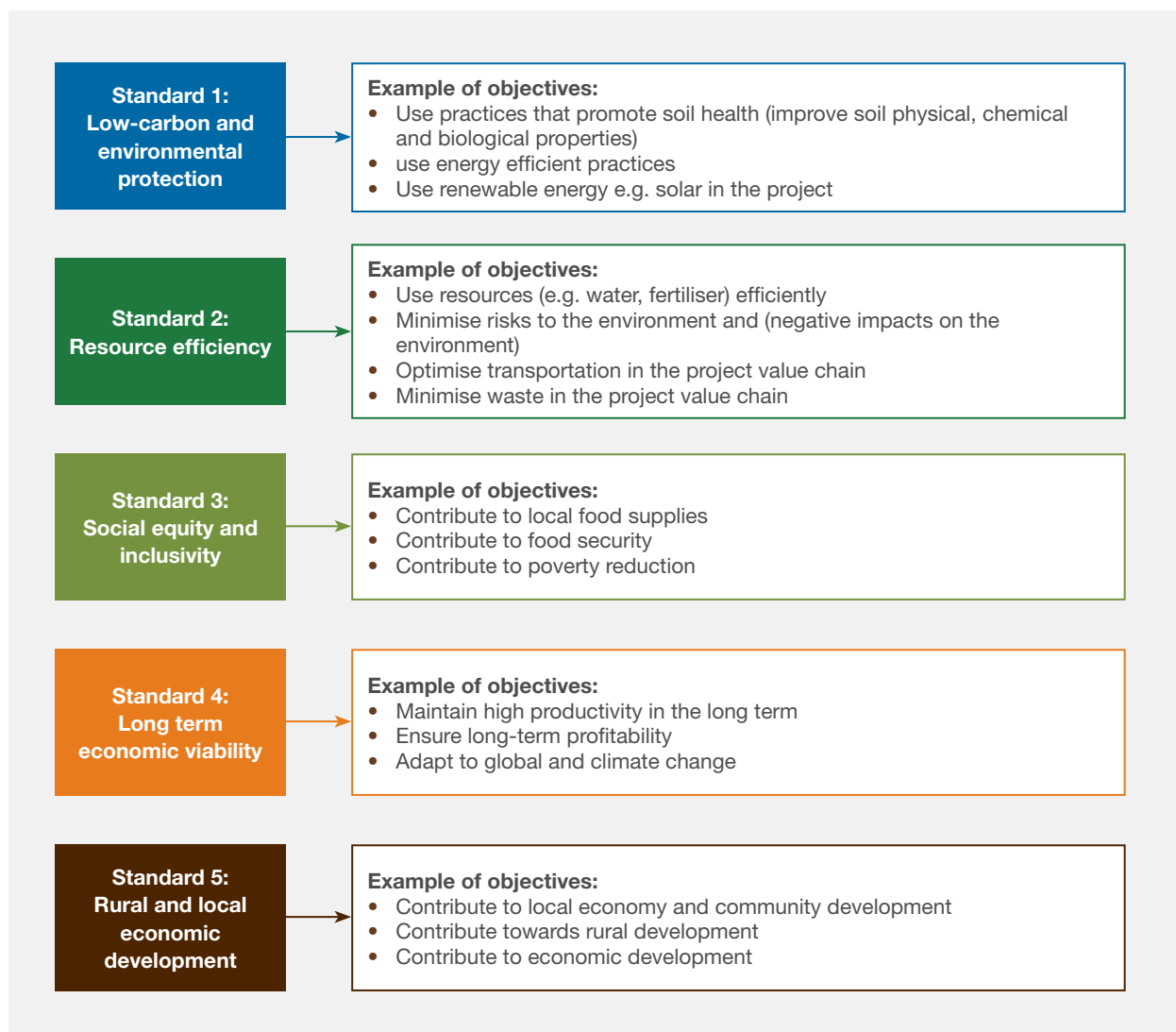


Figure 14. Examples of Green Economy objectives for the design of a crop production project

- a) **Critical Success Factors (CSFs):** In order to meet the objectives under each Green Economy standard (as shown in the figure above), there are a number of factors that will be critical for success; and these are called Critical Success Factors (CSFs). The CSFs for an agricultural Green Economy project are context specific, and help focus efforts and inform key retrofitting and subsequent project management decisions. The CSFs are the areas in which good performance is necessary to ensure attainment of Green Economy standards and agricultural objectives, and should receive constant and careful attention.
- b) **Actions:** In addition, for each of the objectives of an agricultural Green Economy project, there will be a number of specific actions or practices that can be adopted in order to meet the objective. See Chapter 5 for Actions
- c) **Indicators:** See Chapter 5

In the figures 15a to 15e you will find examples of CSFs for each objective. Each diagram is representative of one of the Green Economy standards and also shows the related objectives and CSFs. For the Actions and Indicators associated with each of the standards please refer to Chapter 5 of this guideline.

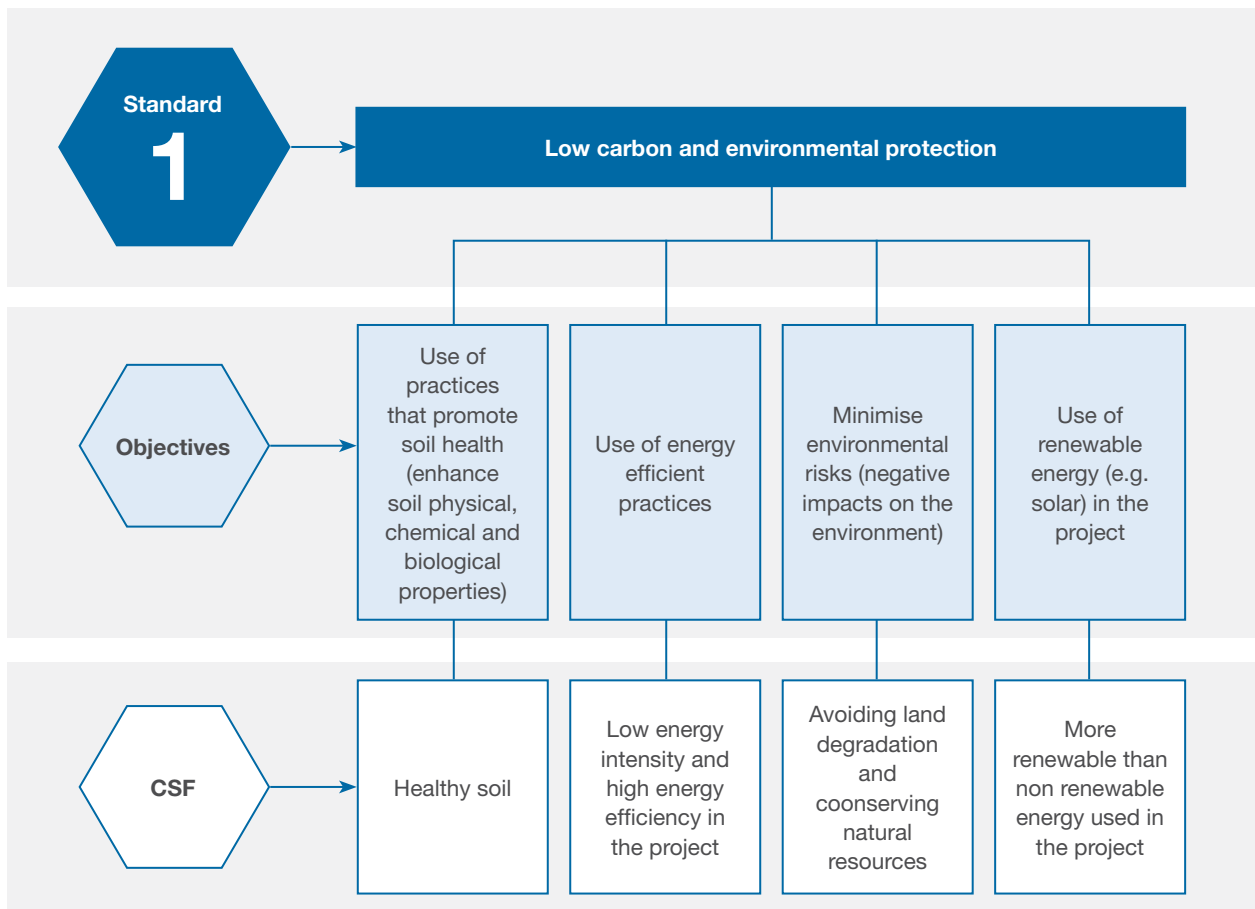


Figure 15a. Critical Success Factors for low carbon and environmental protection in a Green Economy project



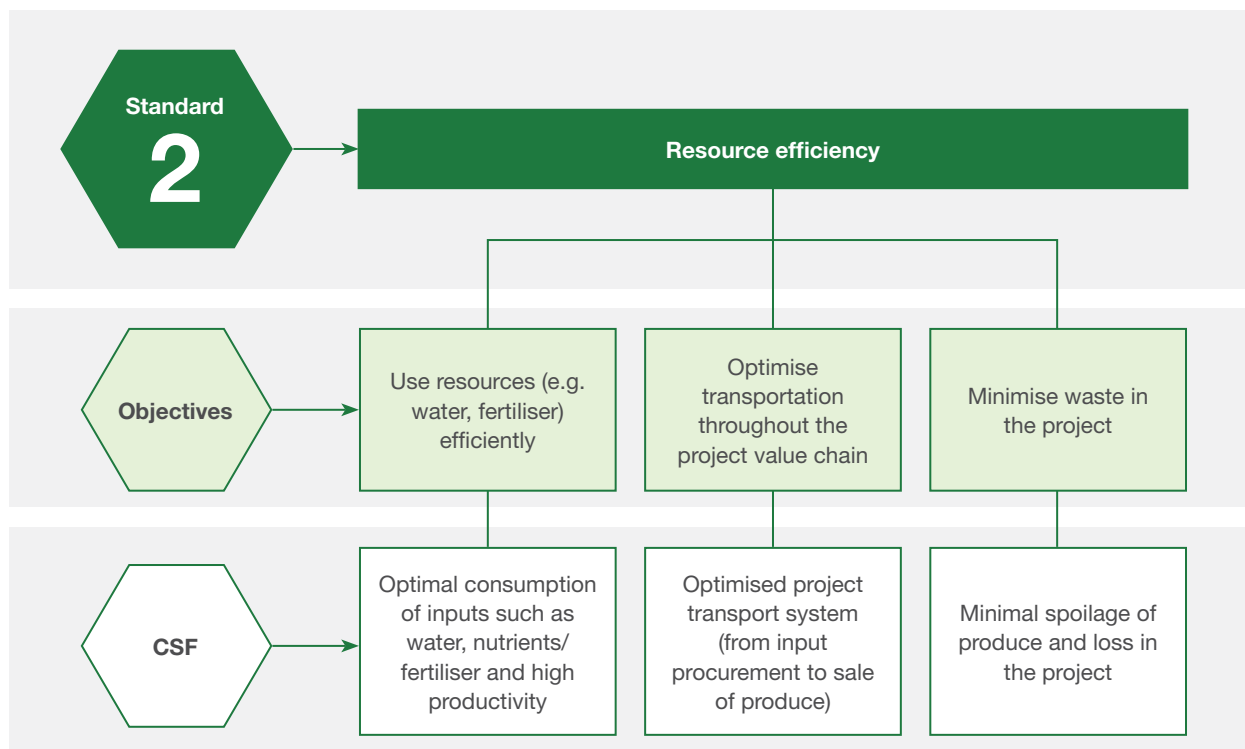


Figure 15b. Critical Success Factors for resource efficiency in a Green Economy project

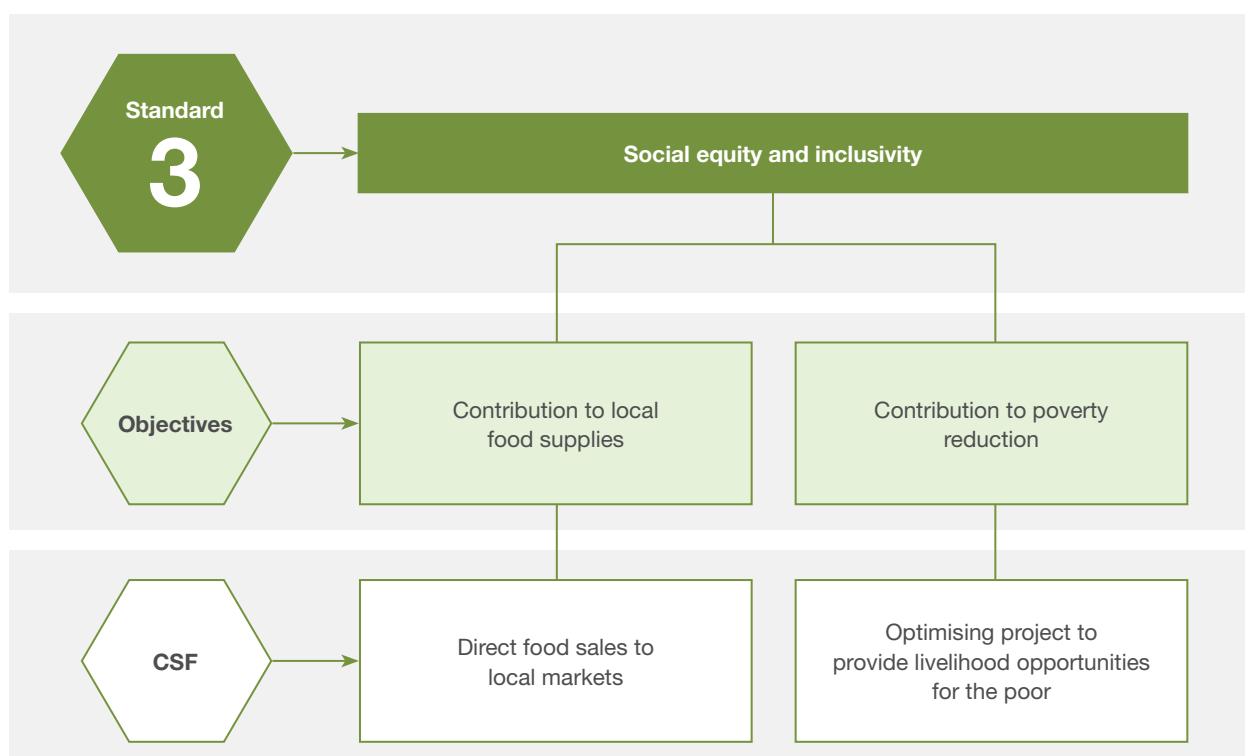


Figure 15c. Critical Success Factors for social equity and inclusivity in a Green Economy project



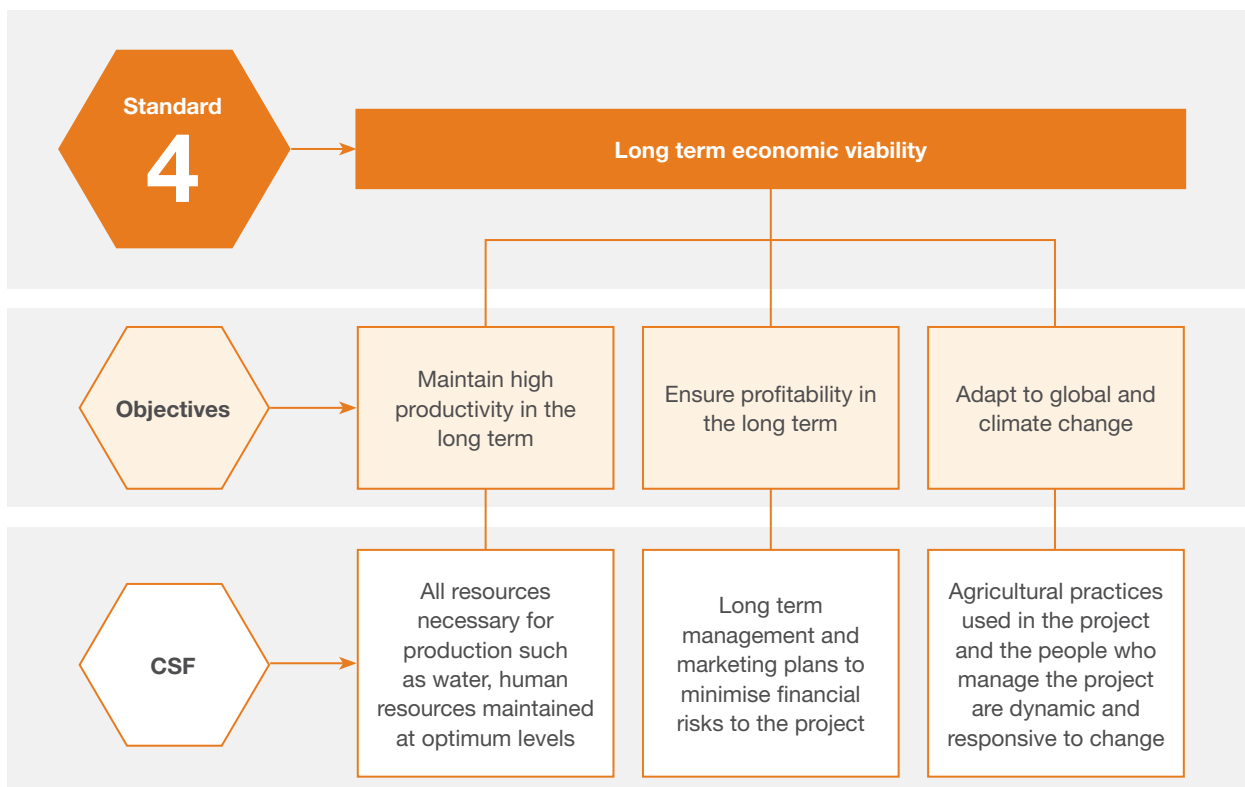


Figure 15d. Critical Success Factors for long term economic viability in a Green Economy project

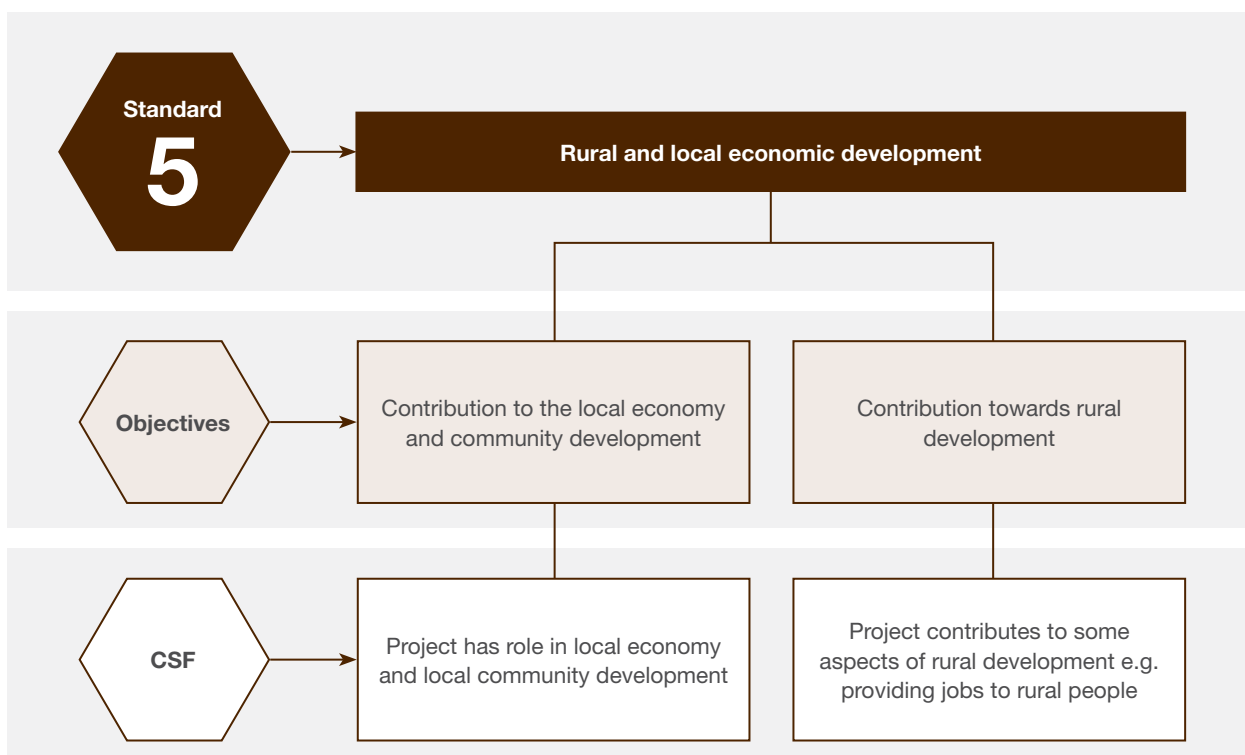


Figure 15e. Critical Success Factors for rural and local economic development in a Green Economy project

# PART **3**

## IMPLEMENTING AN AGRICULTURAL GREEN ECONOMY PROJECT

THIS SECTION OF THE GUIDELINE FOCUSES ON HOW TO IMPLEMENT A GREEN ECONOMY PROJECT. THIS APPLIES TO BOTH PROJECTS THAT ARE BEING MODIFIED FOR THE GREEN ECONOMY AND NEW PROJECTS. THIS SECTION LOOKS AT THE ACTIONS THAT SHOULD BE TAKEN AND THE MONITORING AND EVALUATION THAT IS REQUIRED TO ENSURE THAT A PROJECT SUCCEEDS. THE SECTION ALSO IDENTIFIES POTENTIAL RISKS TO A PROJECT AND HOW TO MANAGE THEM. SOME TOOLS FOR HELPING A PROJECT TO ACHIEVE ITS OBJECTIVES ARE ALSO PRESENTED.

### CHAPTER 5:

Required actions, monitoring and evaluation

Actions required to achieve success

Monitoring and evaluating project success

Indicators for monitoring and evaluation

### CHAPTER 6:

Potential risks and challenges to a project

Standard 1: Low carbon and environmental protection

Standard 2: Resource efficiency

Standard 3: Social equity and inclusivity

Standard 4: Long term economic viability

Standard 5: Rural and local economic development

### CHAPTER 7:

Some tools for ensuring that a project achieves its objectives

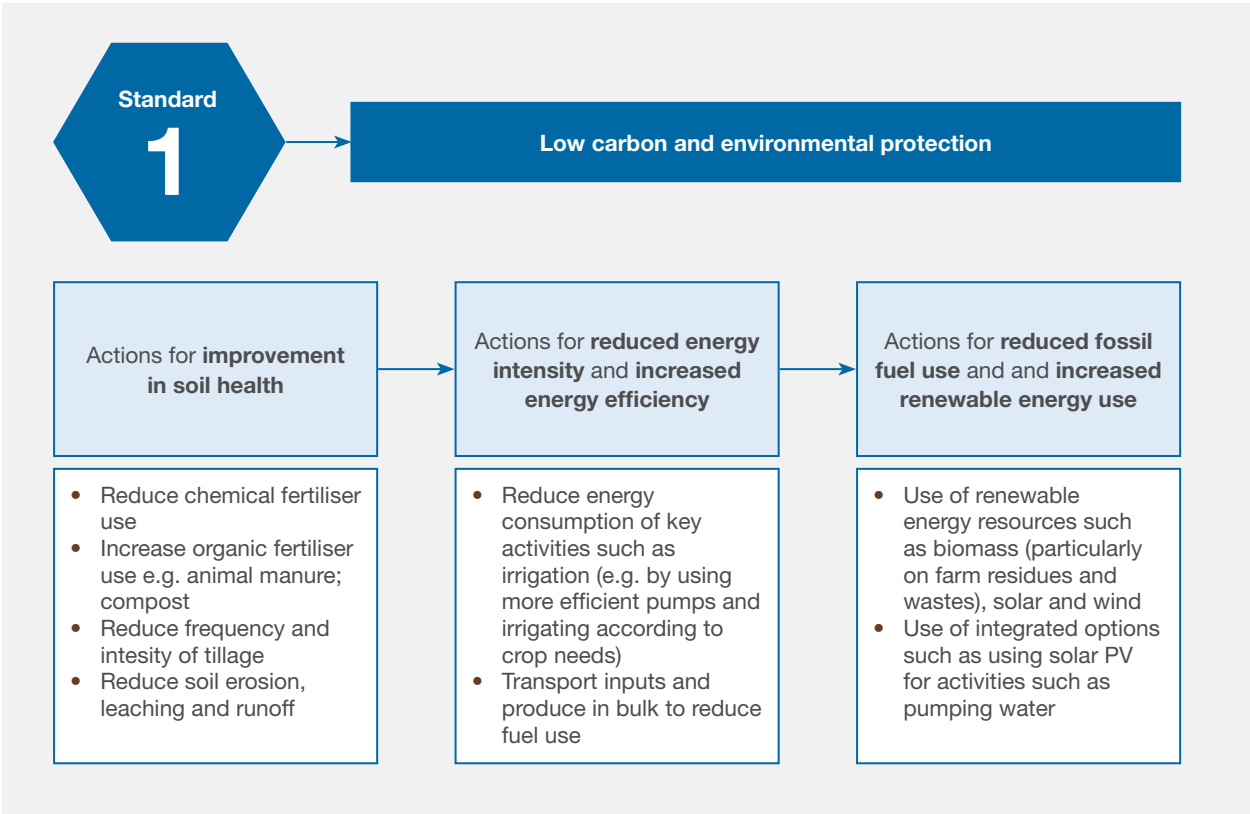
# CHAPTER 5: REQUIRED ACTIONS, MONITORING AND EVALUATION

This chapter applies to both new projects and those that are being modified for the Green Economy.

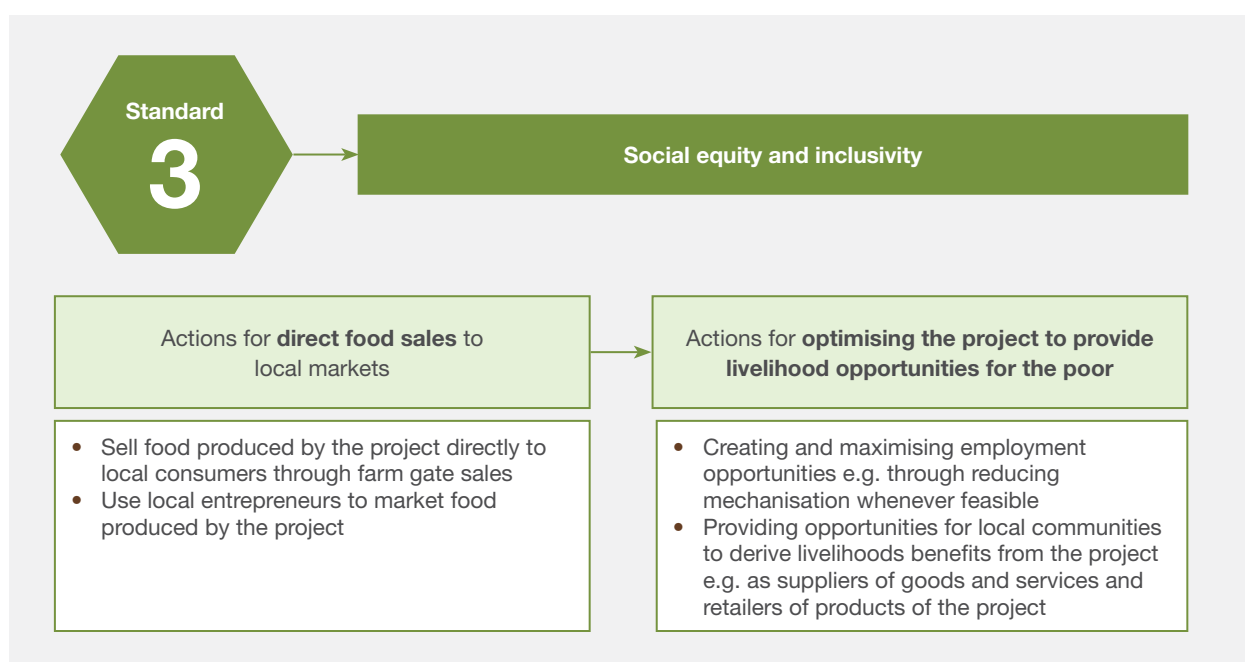
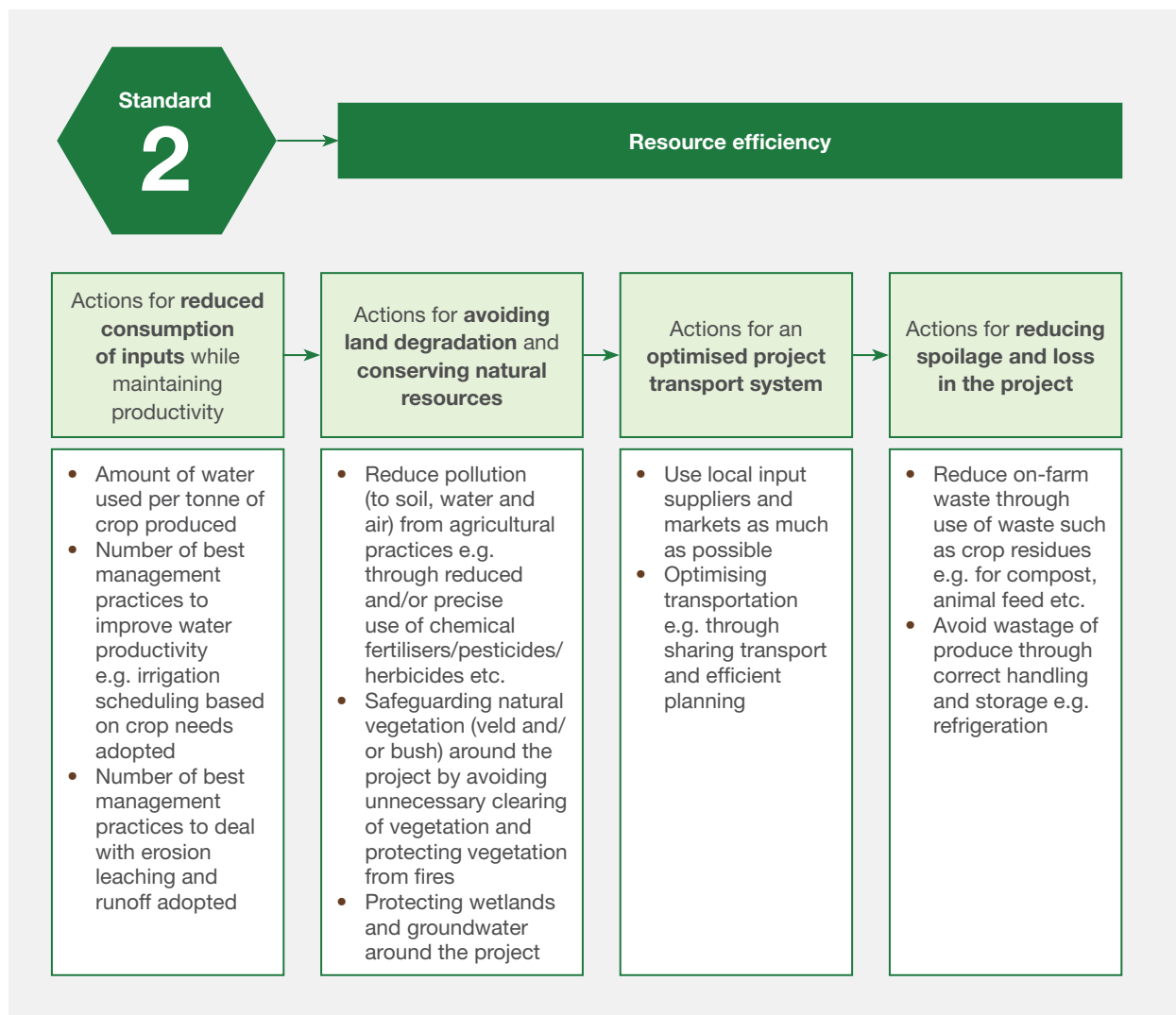
Implementation is the process of carrying out or putting a decision or plan into effect. The focus of this chapter of the guideline is to provide information on how to implement a Green Economy project and how to achieve success for each standard and objective.

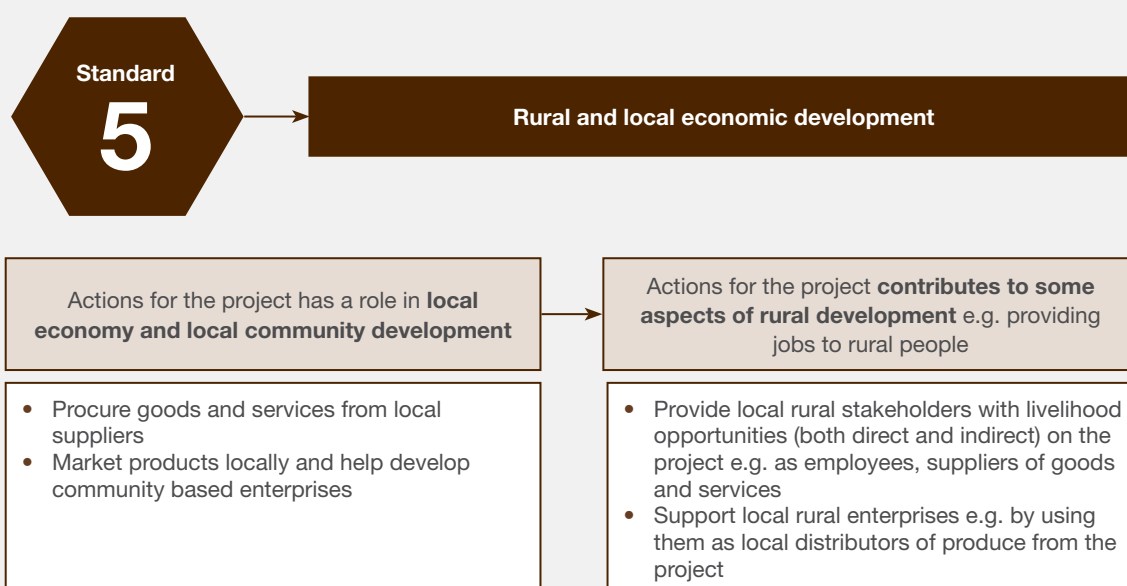
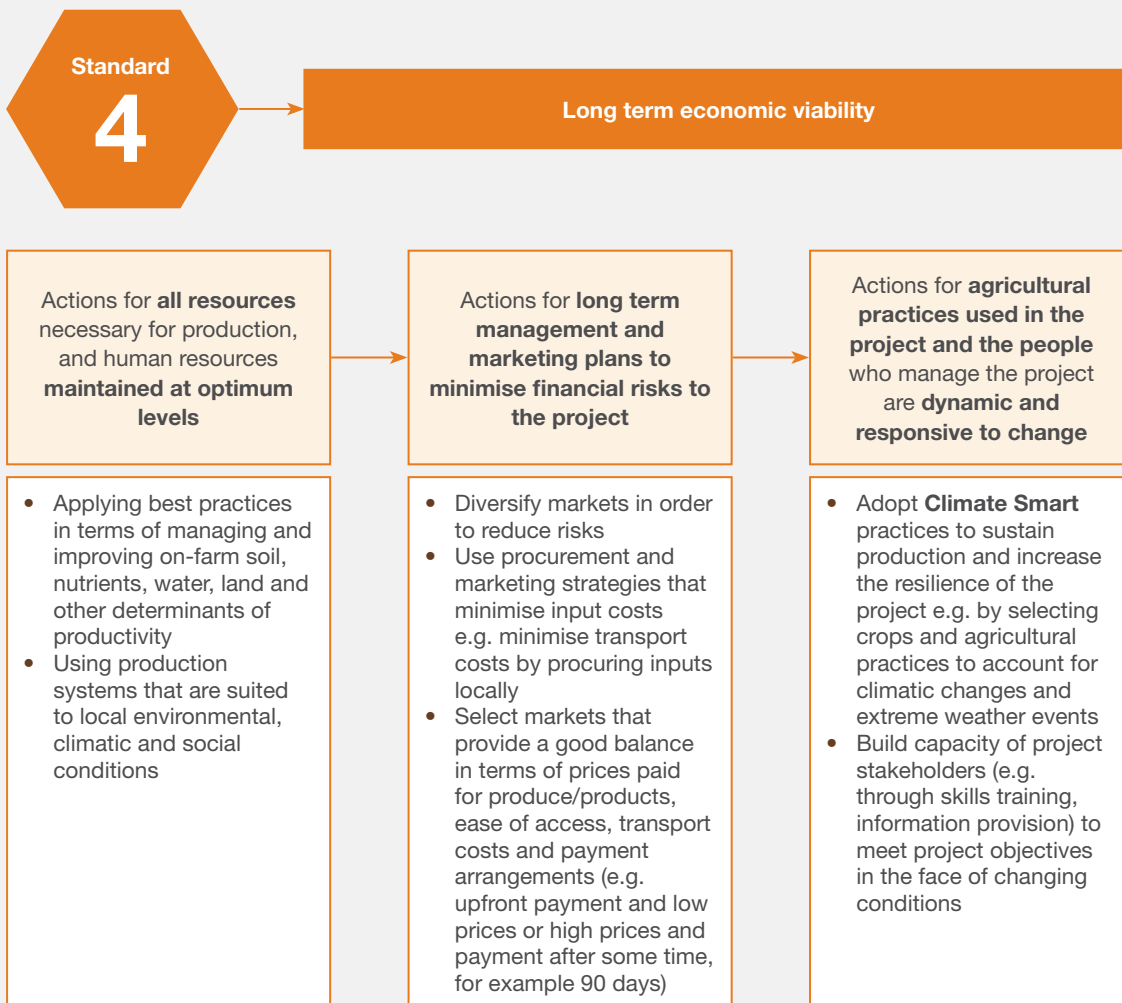
## 5.1 Actions required to achieve success

Once the objectives and factors that are critical for success are defined, it is necessary to identify the specific actions that should be taken and the practices that should be applied under each objective to achieve the critical success factors. Examples of the required actions for each objective (under each standard) are given below:

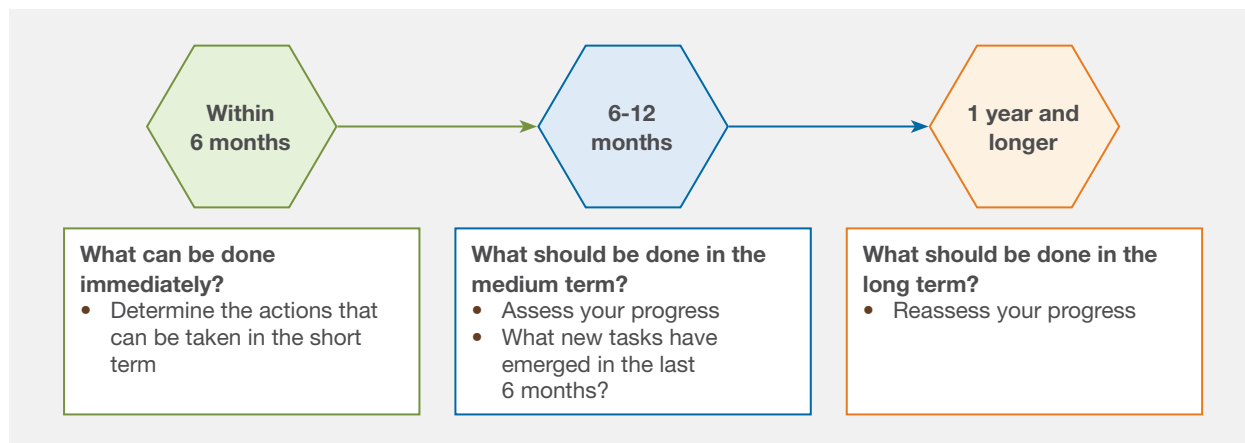








The identified actions can be categorised in terms of a timeline, for example:



## 5.2 Monitoring and evaluating project success

Monitoring is the ongoing process of obtaining regular feedback on the progress being made towards achieving the objectives of a project<sup>12</sup>, and is based on assessing actions and progress towards achieving planned results. Evaluation, on the other hand is an assessment of either completed or ongoing activities to determine the extent to which they are achieving stated objectives and contributing to decision making<sup>13</sup>. Through monitoring and evaluation, the extent to which a project is achieving its goals; and potential problems can be identified, and this can be used to inform decisions on actions that are required to improve performance.

A monitoring and evaluation plan should be developed for each project, and suitable indicators of performance for each objective should be identified. The definition of an indicator is given in Appendix 5 (Glossary of terms) at the end of this document.

## 5.3 Indicators for monitoring and evaluation

The indicators used to monitor and evaluate a project should be based on the specific objectives, critical success factors and actions identified for that project. Measurement of some indicators may require specialised equipment and may be time intensive, and may not be possible for some projects. It is important for projects to select indicators that they can easily monitor as the objective of monitoring is not to burden projects. Below are examples of indicators that could be used to assess the performance of a vegetable production project that is used as an example in this guideline. However, these are guiding indicators only; it is not suggested that each of the listed indicators should be measured in each project.

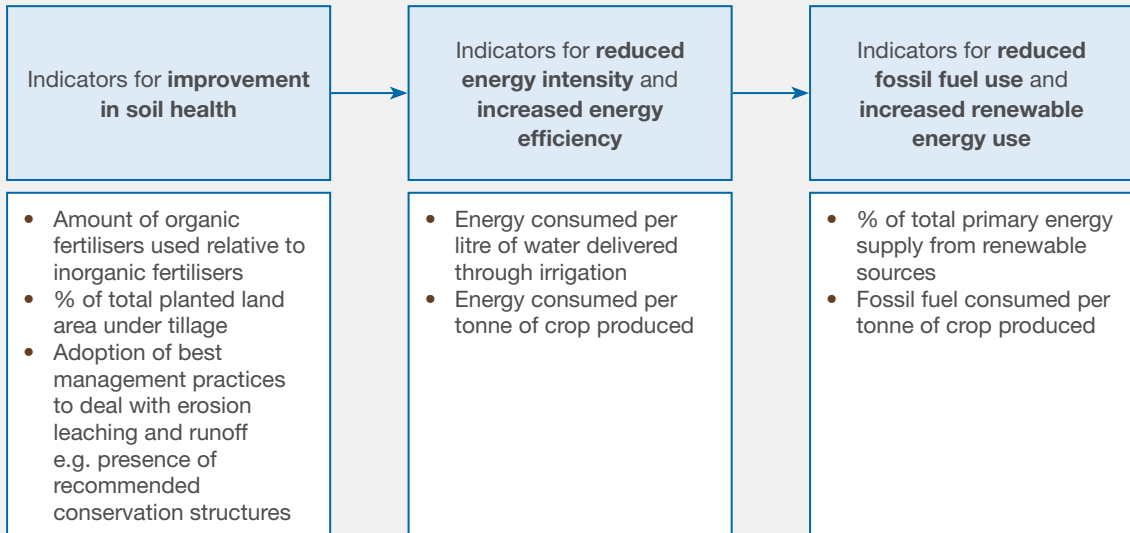
12 UNDP, 2009. Handbook on planning, monitoring and evaluating for development results. <http://web.undp.org/evaluation/handbook/documents/english/pme-handbook.pdf> [accessed 1 September 2017]

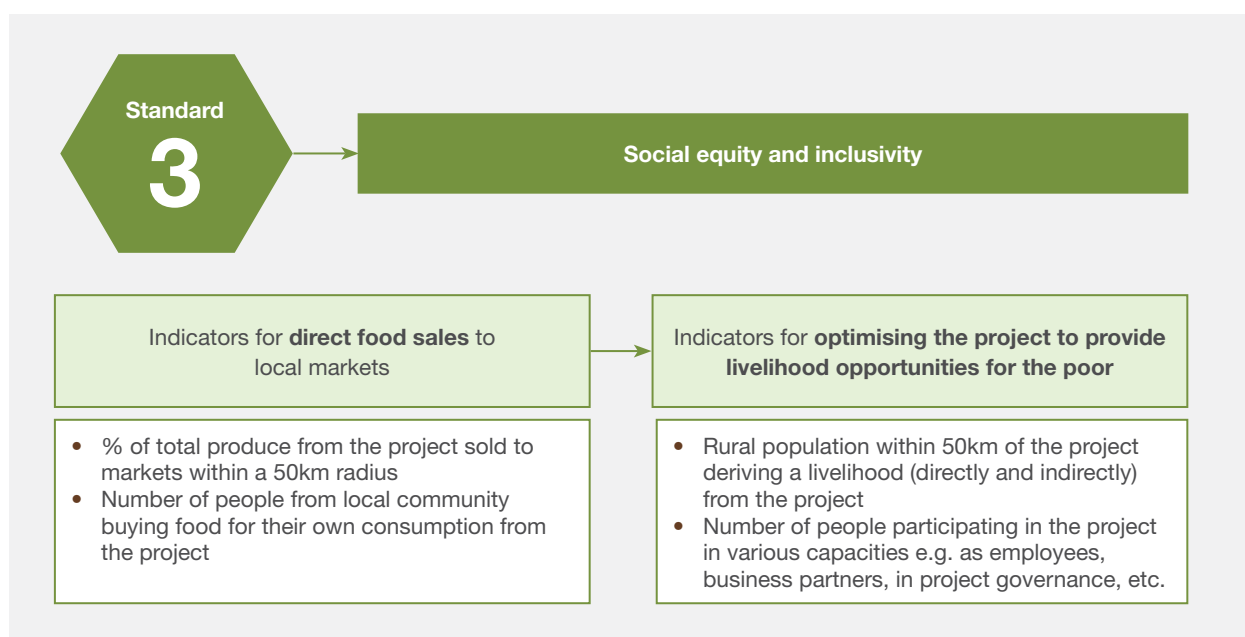
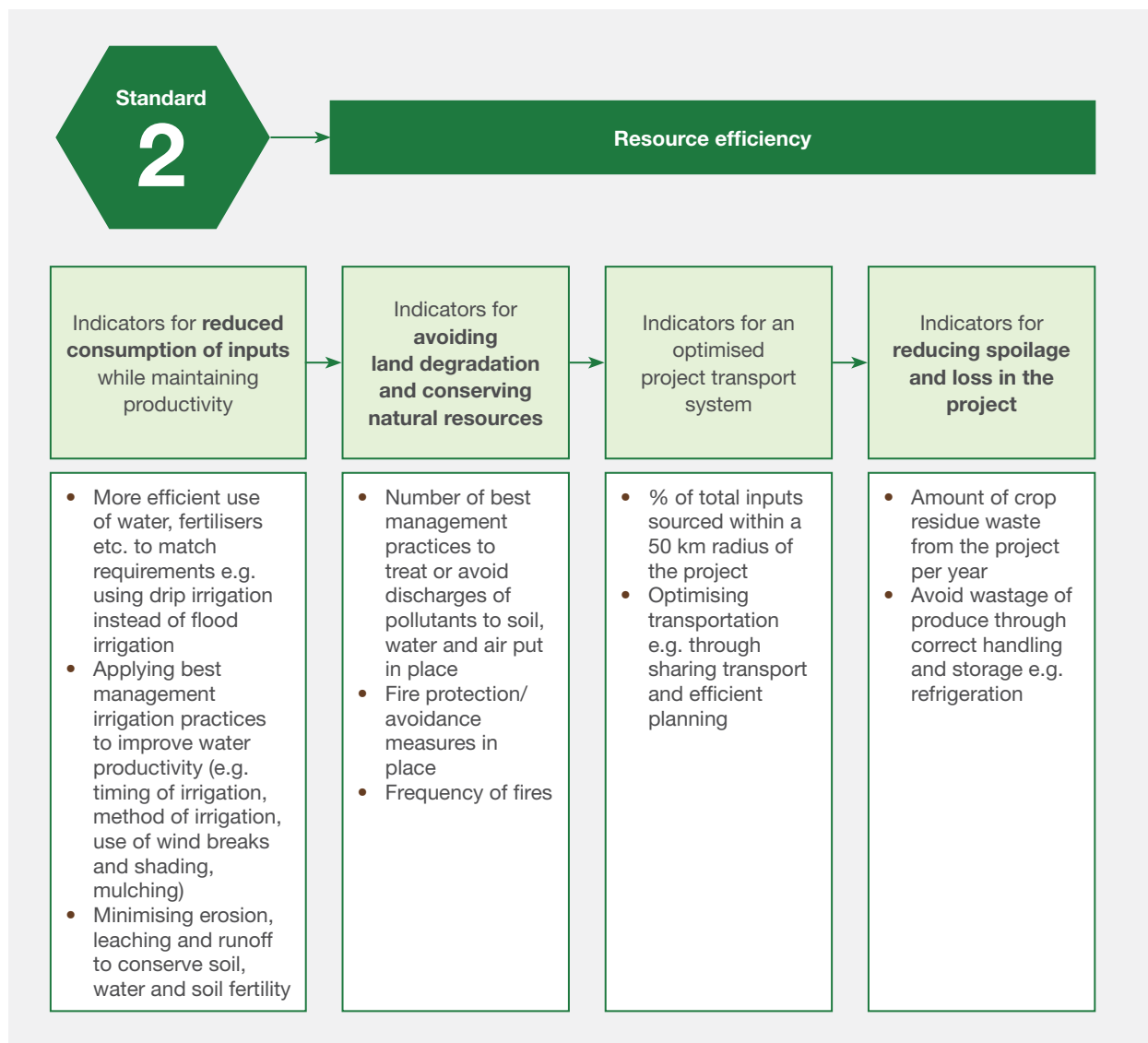
13 UNDP, 2009. Handbook on planning, monitoring and evaluating for development results. <http://web.undp.org/evaluation/handbook/documents/english/pme-handbook.pdf> [accessed 1 September 2017]

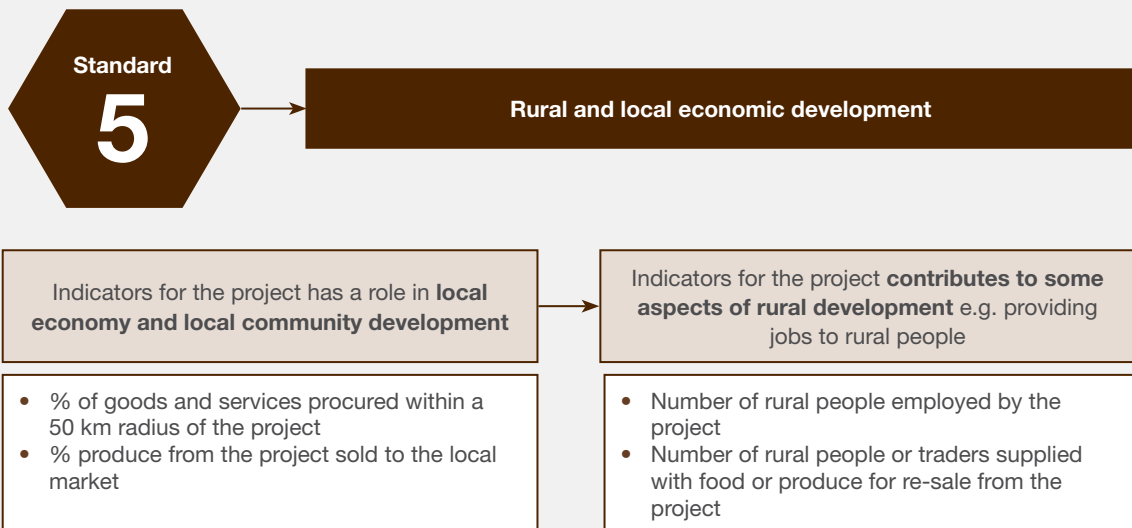
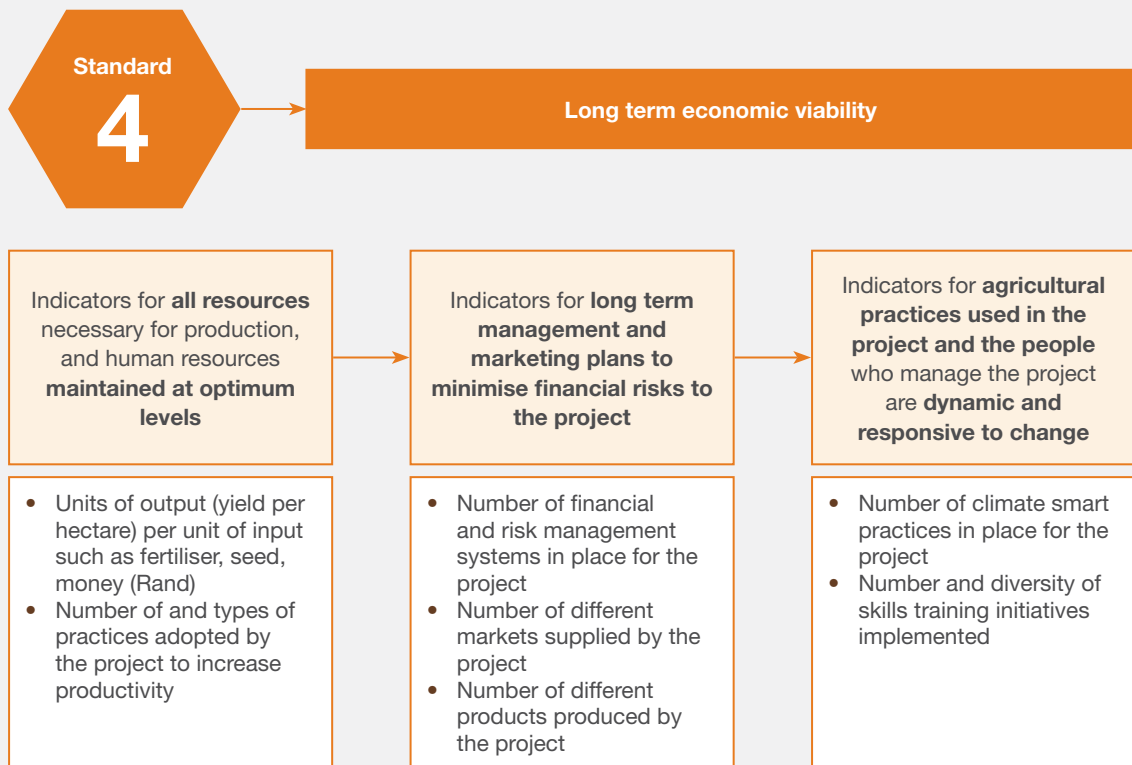


# Standard 1

## Low carbon and environmental protection









## CHAPTER 6: IDENTIFYING POTENTIAL RISKS AND CHALLENGES TO A PROJECT AND MANAGING THEM

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**This chapter applies to both new projects and those that are being modified for the Green Economy.**

A project may be unable to meet its objectives for a number of reasons. Some of the reasons may be beyond the control of a project, but others could be avoided through careful planning. It is critical to identify potential risks and challenges to a project. For each project objective, the main potential risks and challenges to the achievement of that objective should be identified. Examples of potential risks and challenges that would hamper the achievement of project

objectives is presented below. The information presented below is not exhaustive. The likely risks and challenges for each project are unique and should be identified within a project's particular circumstances.

Once potential risks and challenges have been identified, a strategy for avoiding and/ or dealing with each risk should then be put in place. Some examples of potential risks and challenges; and strategies for addressing the risks identified are listed alongside the risks.



## 6.1 Standard 1: Low carbon and environmental protection

### Objective 1: Build and maintain soil health

#### What are the potential risks to the project?

- Lack of adequate knowledge by those running projects on alternatives to practices which pose risks to soil health;
- Difficulty accessing alternative inputs (e.g. organic fertilisers) as these may not be readily available in outlying areas.
- Lack of/ limited access to relevant knowledge on methods and technologies to ensure environmental protection in the various operations in an agricultural Green Economy project may hinder environmental protection

#### How to manage the risks

- Ensure sustained information provision on all aspects of the project
- Develop and maintain systems that continually build capacity of project managers and staff e.g. through workshops and training events

### Objective 2: Use energy efficient practices:

#### What are the potential risks to the project?

- Inadequate knowledge and information on latest energy efficient equipment
- Lack of resources to access energy efficient equipment
- Limited knowledge to enable management of operations and equipment to ensure energy efficiency

#### How to manage the risks

- Capacitate managers and staff e.g. through training and information provision on both the theoretical and practical aspects of improving energy efficiency
- Make provision for adequate funding to enable equipment upgrades or acquisition of new energy efficient equipment

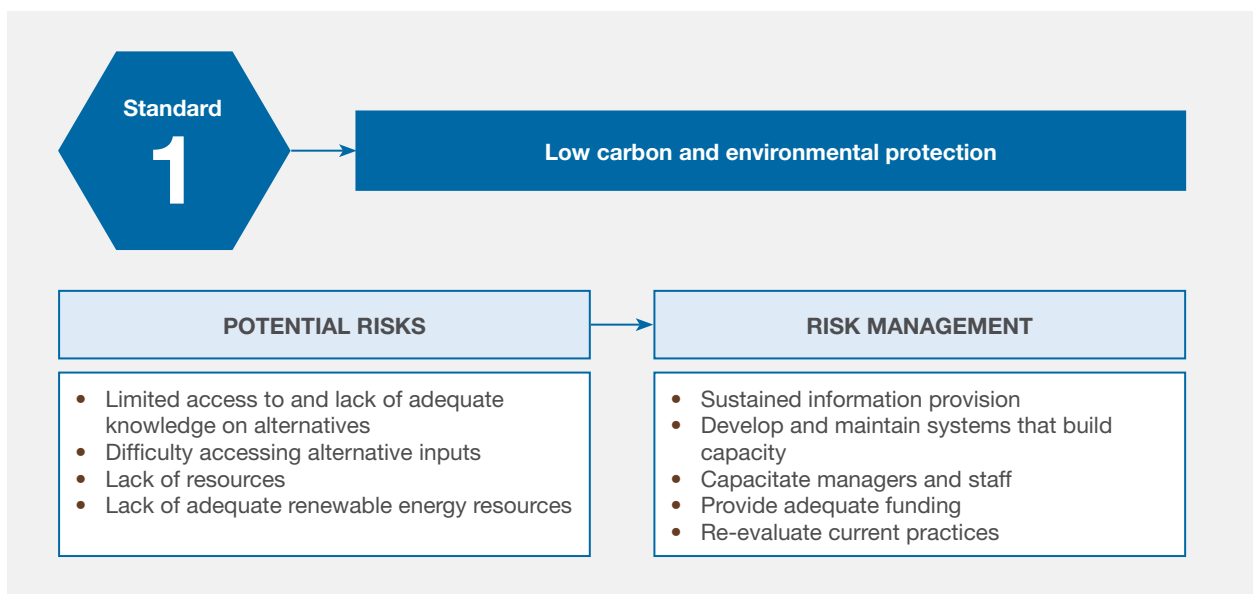
### Objective 3: Use renewable energy and reduce use of fossil fuels

#### What are the potential risks to the project?

- Lack of adequate renewable energy resources e.g. solar equipment
- Difficulty accessing alternative energy sources and/or technology for various reasons, e.g. lack of financial resources, remote location etc.
- Lack of requisite knowledge to efficiently run renewable energy systems

#### How to manage those risks

- Consistently re-evaluate current practices and assess different options for improving access to renewable energy, different ways of doing things, /new technology that may perform better in terms of the identified Green Economy targets
- Capacitate staff and managers through knowledge and information building activities such as workshops, subscriptions to information sources such as magazines and newsletters.





## 6.2 Standard 2: Resource efficiency

### Objective 1: Use resources efficiently

#### What are the potential risks to the project?

- Limited technical and/or managerial knowledge and capacity on the part of project operators/managers, for example to correctly manage processes (e.g. irrigation scheduling) and use equipment efficiently
- Limited means to access requisite technology and/or equipment e.g. due to inadequate financial resources

#### How to manage the risks

- Make provision for and use external expertise (e.g. specialists, consultants) to provide technical and managerial assistance as required
- Plan project financing to ensure access to information and equipment when required
- Develop good relationships with local agricultural advisory and technical services
- Capacitate managers and staff in efficient resource use through ongoing provision of knowledge and information
- Develop and maintain systems that support capacity building in the project

### Objective 2: Minimise risks to the environment (negative impacts on the environment)

#### What are the potential risks to the project?

- Knowledge and information on practices, methods and operation of
- equipment to minimise risks to the environment may be lacking / not readily available
- Resources to enable acquisition of relevant technologies e.g. biogas digesters to minimise risks to the environment may be unavailable

#### How to manage the risks

- Capacitate project managers and staff with adequate knowledge and information to ensure all project operations and processes do not harm the environment
- Make financial provision for acquisition of knowledge e.g. expertise and equipment to improve the project's environmental performance

### Objective 3: Optimise transportation in the project

#### What are the potential risks to the project?

- Requisite inputs may not be available locally, necessitating transportation over long distances
- Local markets may not be able to absorb produce or products from the project necessitating transportation to distant markets
- Local conditions (e.g. infrastructure, available skills) may not be suitable for development of value addition, forcing transportation of produce to other places for value addition

#### How to manage the risks

- Lobby local businesses to stock requisite inputs
- Work with other projects/farmers in the vicinity to combine requirements and transport inputs in bulk (a single large truck would deliver to all local projects instead of each project transporting its own inputs)
- Work with other local projects/ farmers to combine produce and transport to distant markets in bulk
- Explore options for local processing or value addition e.g. drying of produce to reduce the frequency of transportation and amount of produce which needs to be transported to markets regularly
- Form partnerships e.g. with the business sector, local government to create the necessary conditions e.g. infrastructure provision, human capacity building to support local value addition

### Objective 4: Minimise/reduce waste in the whole project value chain

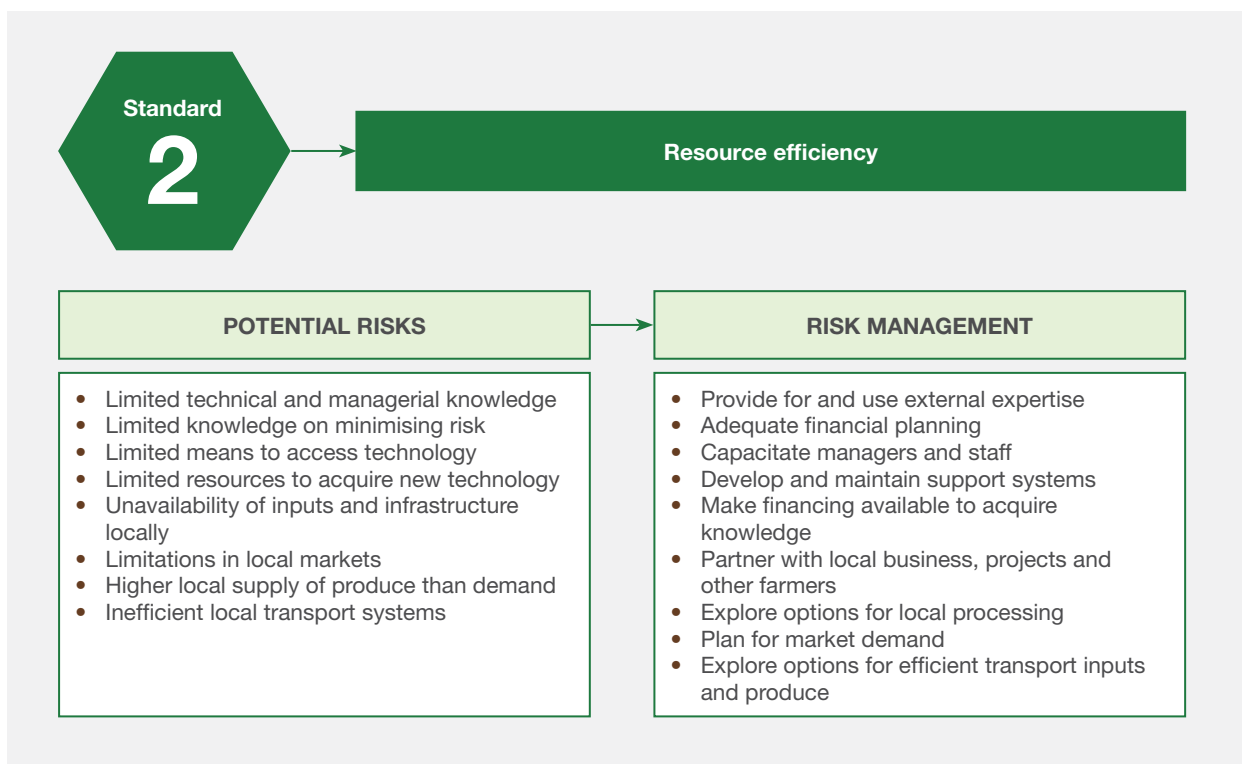
#### What are the potential risks to the project?

- Supply of a project's products on the market may be higher than demand resulting in wastage
- Location of a project may be such that getting a product to market takes a long time resulting in spoilage of produce/products
- Efficiency of transport and logistics may be low resulting in marketing delays and spoilage

#### How to manage those risks

- Plan production to take key factors such as market demand projections into consideration
- Use external expertise (e.g. consultants, agricultural specialists) to adequately plan production
- Capacitate managers and staff on proper handling of produce to minimise waste
- Work with transporters to improve transport efficiency and minimise delays





### 6.3 Standard 3: Social equity and inclusivity

**Objective 1: Contribute to availability of affordable and nutritious food**

#### What are the potential risks to the project?

- Project may not be involved in nor have the means to facilitate distribution of the food it produces to make it accessible to different groups, especially the disadvantaged;
- A project may lack capacity and resources (human, financial etc.) to use diverse marketing and distribution channels to ensure its food products reach different groups;
- A project is unlikely to be involved in the marketing and distribution of its food products to the extent that it has control over the price that consumers eventually pay for its products;

#### How to manage the risks

- Explore and build partnerships to influence local distribution of food produced by the project e.g. with retailers, local government, informal traders;
- Build partnerships with other stakeholders to enable the project to access different markets;
- Price produce from the project fairly and lobby those involved in the distribution to do the same;
- Build partnerships with other stakeholders to work towards fair pricing to ensure availability of affordable food;
- Use production and handling practices which maintain the safety and nutritional quality of produce/products from the project;

**Objective 2: Contribute to increased food security**

#### What are the potential risks to the project?

- A project may not have the capacity and/or resources to contribute to or facilitate local value addition of its food products;
- A project may (due to factors such as size and market share) not be able to accumulate enough reserves to provide a buffer against events such as floods, market volatility and others to ensure consistent supply of food to consumers (both locally and in more distant markets).

#### How to manage the risks

- Build partnerships with other stakeholders e.g. similar projects, food processors, local government etc., to work together to develop value addition capacity for locally produced food;
- Build capacity of project staff and managers to plan for and deal with unknown factors, to ensure stability of project output (build resilience of the project).

**Objective 3: Contribute to poverty reduction**

#### What are the potential risks to the project?

A project's ability to contribute to poverty reduction may be hampered by limited stakeholder capacity and/or opportunities for participation for a variety of reasons including:

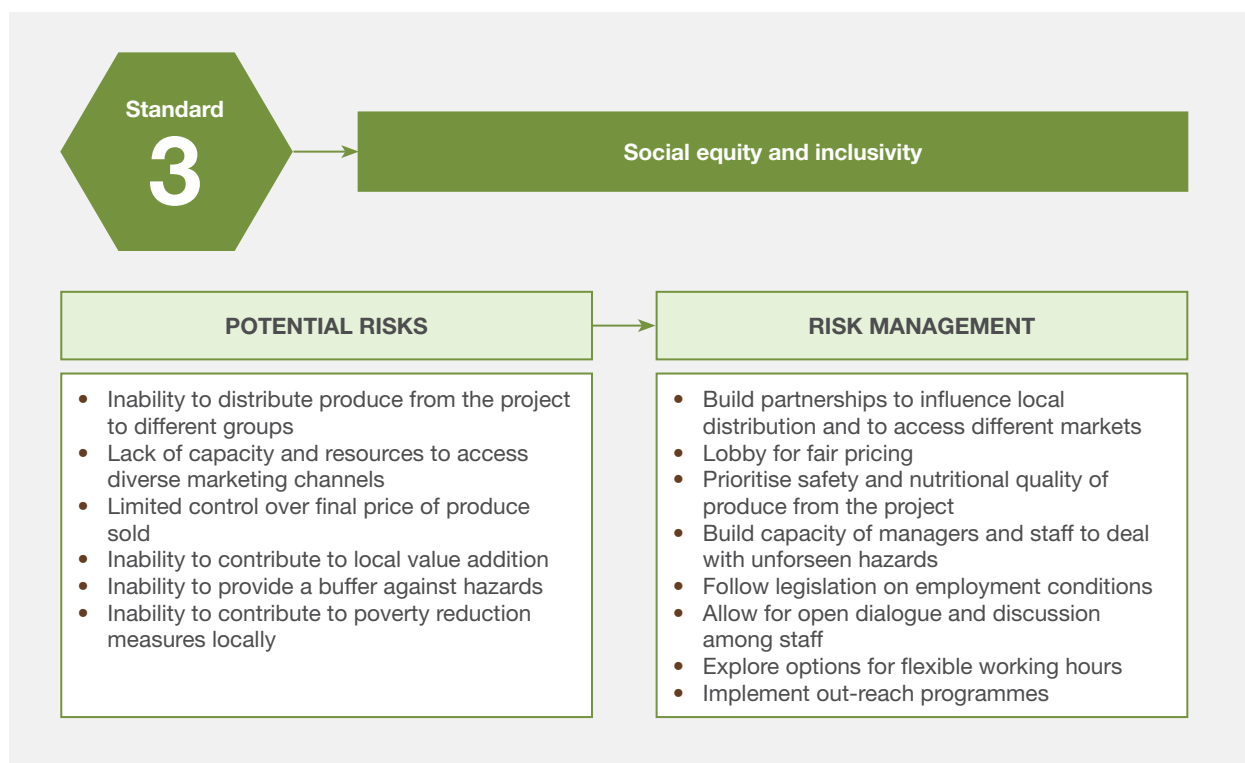
- Lack of requisite levels of basic education and/or skills;
- Cultural beliefs and social barriers on gender roles and disability could limit or interfere with the free participation of certain groups, for example women and differently abled people in a project;



- Projects may lack appropriate jobs for some groups e.g. differently abled people and this would limit representative participation;
- Projects may, due to factors such as size, focus and financial resources be unable to provide varied employment and opportunities for empowering stakeholders, e.g. through capacity building at various levels from unskilled workers right up to project managers;
- Local conditions such as poverty could hamper efforts to achieve social equity and inclusivity. Marginalised groups may not have the financial resources to enable participation, e.g. to travel to meetings or capacity building events;
- Social responsibilities could hinder the participation of certain groups. Care giving roles of women may hinder women who may be interested in participating from doing so;
- Projects experiencing slow growth and/or poor financial performance are unlikely to be sure of their long term survival and therefore unable to offer secure employment or adequate benefits on a sustained basis;
- Project type and focus would affect a project’s capacity to contribute to poverty reduction. Projects with a narrow focus and limited prospects or no intention to diversify (e.g. those focused on production of a certain commodity with no intention or capacity to add value to the commodity) may only be able to provide a narrow range of jobs and unlikely to provide career development opportunities for employees.

**How to manage the risks**

- Follow the country’s legislation on employment and working conditions;
- Put in place processes for regular dialogue between the project management and employees to ensure all parties are aware of and abide by their rights and responsibilities;
- Project should have clear communication methods and processes for all involved;
- Explore different options and put in place measures to allow flexibility in working conditions e.g. working hours, work quotas , etc. to accommodate workers with different circumstances;
- Put in place measures to encourage diverse participation in the project, e.g. by holding stakeholder activities such as consultations in locations which are easily accessible to the majority;
- Form partnerships with different stakeholders to identify opportunities for and implement poverty reduction activities linked to the project;
- Explore options for contribution to poverty reduction in various ways, e.g. optimising delivery of produce to informal traders to minimise their transport costs and improve profit;
- Develop an out-reach programme to the local community – capacity building and knowledge sharing of green principles.



## 6.4 Standard 4: Long term economic viability

### Objective 1: Sustained high productivity in the long term

#### What are the potential risks to the project?

- Difficulty in accessing required inputs e.g. seed, water and others which are determinants of productivity would negatively affect a project's capacity to sustain productivity.
- Lack of adequate financial resources or inability to physically access the resources e.g. broken pumping equipment making it impossible to irrigate;
- Changes in environmental conditions such as the occurrence of a drought or flood would negatively affect the productivity of a project;
- Human factors such as lack of technical expertise or information on how to carry out certain operations could reduce productivity.

#### How to manage the risks?

- Plan project to ensure consistent access to required inputs, e.g. by putting in place an adequate and flexible budget to ensure access under different conditions;
- Put in place an adequate budget to cover emergencies;
- Take out insurance to cover events such as floods;
- Develop capacity building programmes that cover different aspects of an agricultural Green Economy project, including technical aspects.

### Objective 2: Sustained long term profitability

#### What are the potential risks to the project?

Profitability is linked to productivity and marketing, if productivity in a project is low for some of the reasons

outlined under objective 1 above, it means there is less product to sell and therefore less income and profit:

- A project may face profitability problems due to low prices on the market. This may be due to a number of factors, including over-supply of a product on the market, monopolies, and competition from producers who can produce at lower cost than the project;
- Wastage, losses and depreciation of quality of products at various stages of the value chain would affect the quantities and quality of product that eventually gets sold, thus affecting income and profitability

#### How to manage the risks

- Plan project in a way that ensures sustained productivity as highlighted in objective 1 above
- Develop a good understanding of and consistently monitor market trends and plan accordingly
- Plan for and ensure loss minimisation to maximise products that are successfully marketed

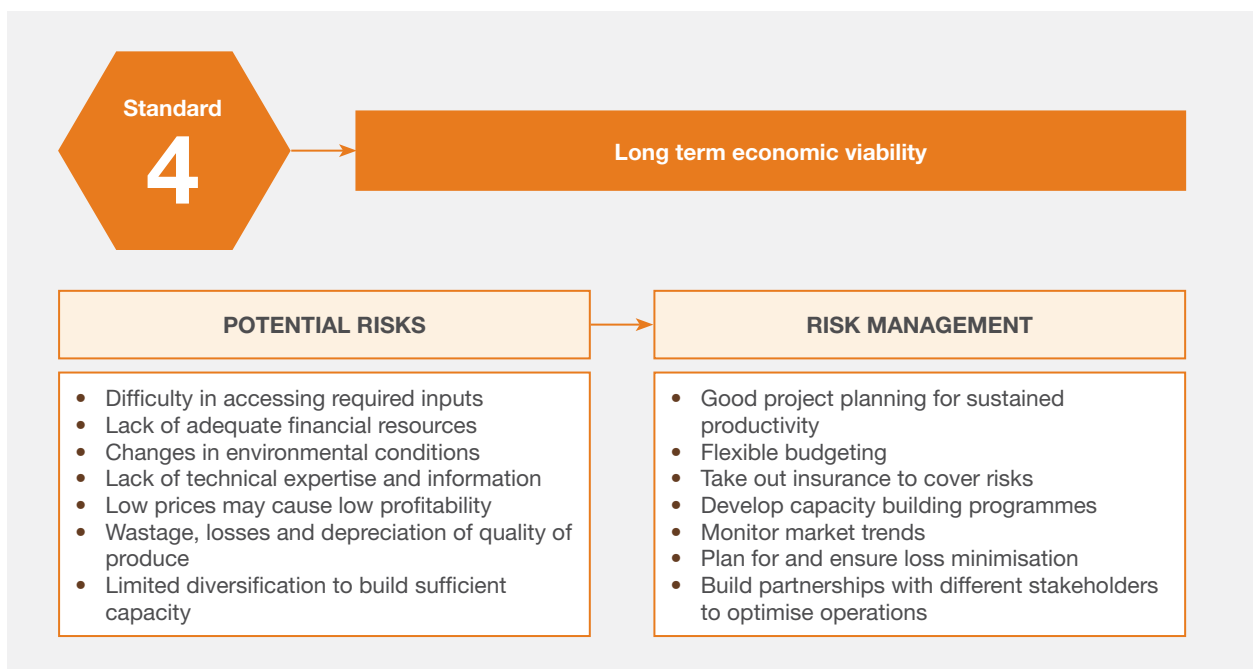
### Objective 3: Adapt to global and climate change

#### What are the potential risks to the project?

- The size of a project and its resource base may not be large enough to allow it to diversify enough to build sufficient capacity to adapt to changing global and climatic conditions;

#### How to manage the risks

- Partner with different stakeholders e.g. other similar projects, government, businesses linked to the project to work together to build capacity to adapt to changing global and climate conditions.



### 6.5 Standard 5: Rural and local economic development

#### Objective 1: Contribute to the local economy and community development

##### What are the potential risks to the project?

- A project may be unable to contribute due to a general lack of capacity of local people to access products such as food which a project may produce or employment opportunities generated by a project as a result of factors such as poverty, lack of requisite education and skills;
- A project’s contribution may be hampered by factors such as lack of infrastructure, for example value addition and further development of value chains for products may be impossible due to lack of adequate infrastructure e.g. roads and/or services such as electricity, piped water, etc.

##### How to manage the risks

- Work with all relevant stakeholders (Local Economic Development initiatives, communities, businesses etc.) to build capacity of local communities to participate in and derive benefits from local Green Economy projects;
- Work together with other projects/farmers and other stakeholders such as local communities, local government and others to support the requisite infrastructure development.

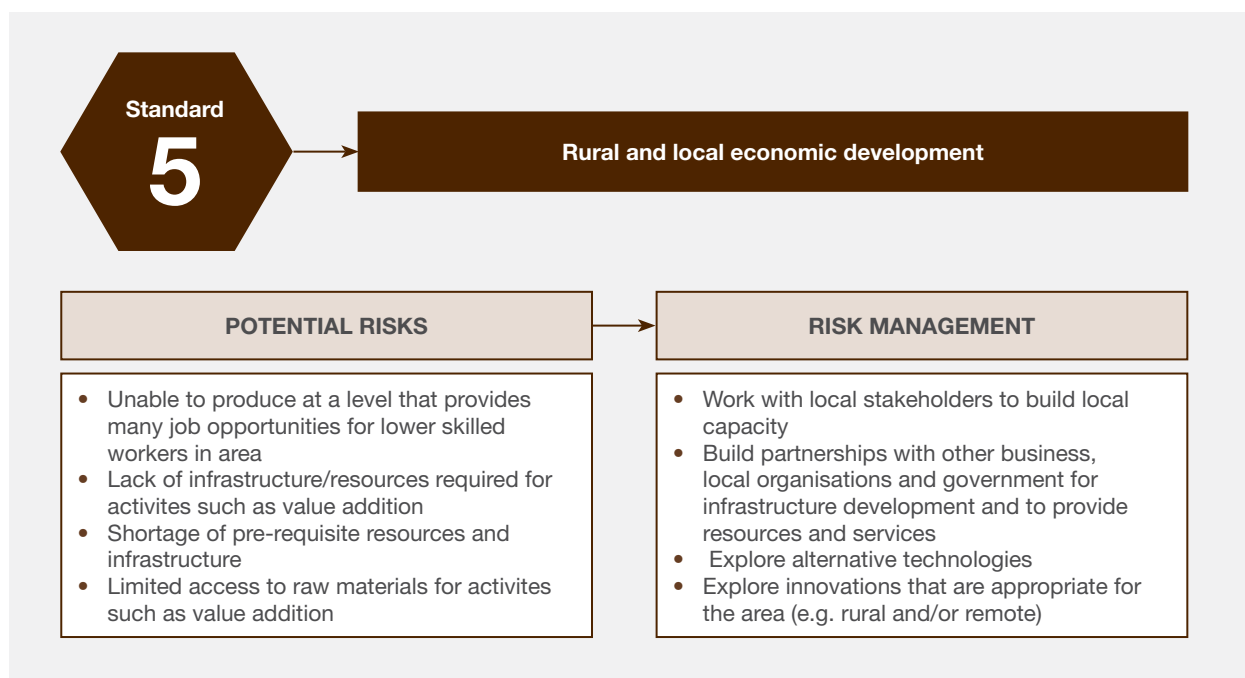
#### Objective 2: Contribute towards rural development

##### What are the potential risks to the project?

- Shortage of pre-requisite natural resources and infrastructure may hinder a production project located in a rural area from contributing to rural development through value adding activities. Shortage of a resource such as water or a service such as electricity, for example would make it impossible to engage in value adding activities such as canning and bottling which may be financially viable locally but require large quantities of water and electricity;
- The remote location of some rural areas may make access to raw materials for value addition and markets difficult, and thus hamper a project from contributing to rural development.

##### How to manage the risks

- Work together with other projects/farmers and other stakeholders such as local communities, local government and others to support the provision of requisite resources and services
- Explore alternative technologies to enable operation using less resources such as water or alternative power sources e.g. solar
- Work with all relevant stakeholders (Local Economic Development initiatives, communities, businesses etc.) to explore ways of addressing constraints related to rural value addition



## CHAPTER 7: SOME TOOLS FOR ENSURING THAT A PROJECT ACHIEVES ITS OBJECTIVES

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An agriculture project designed for the Green Economy or being modified for the Green Economy should be aligned with Green Economy principles or requirements, and this requires balancing agricultural and Green Economy objectives. In designing or changing projects for the Green Economy, there are tensions between agriculture as primary sector which generally has negative impacts on the environment and the Green Economy imperatives related to reducing environmental risks, being low-carbon and resource efficient. There are well-documented agricultural practices that can address these tensions and therefore serve as tools for ensuring that agricultural projects meet their Green Economy goals. Generally, agricultural practices that aim to achieve the following are well suited to aligning projects with the Green Economy:

- Restoring and enhancing soil fertility;
- Reducing soil erosion and improving the efficiency of water use;
- Reducing chemical pesticide and herbicide use;
- Reducing food spoilage and loss.

There are many farming methods or techniques that can be applied to achieve the objectives listed above, and are therefore suitable for application to Green Economy projects. Green agriculture is one example. The greening of agriculture refers to the use of farming practices and technologies that simultaneously maintain and increase farm productivity and profitability while ensuring the provision of food on a sustainable basis; while protecting natural resources (soil, water, air, plants and animals) by reducing pollution and using

resources more efficiently<sup>14</sup>. The design and /or changing of agriculture projects for the Green Economy should therefore be seen as an opportunity for re-orientation and re-structuring of agriculture projects to be more resource-efficient, low carbon and inclusive.

This is especially relevant in modifying projects which follow conventional farming<sup>15</sup> methods. In such projects, changing will entail a process of incorporating practices that are more compatible with the Green Economy. The process of modifying an agriculture project for the Green Economy should therefore be seen as a continuum, whereby certain agricultural practices, systems and standards are changed and improvements are continuously made in order to improve alignment of the project goals with those of a Green Economy. Examples of practices that can be used in project modification and project design include:

1. **Conservation Agriculture (CA)** is a way of producing crops while striving to save resources, achieve high sustained production levels, acceptable profits and conserving the environment. The Food and Agriculture Organization of the United Nations<sup>16</sup> highlights that conservation agriculture is characterised by three principles which are linked to each other:
  - a) Continuous minimum mechanical soil disturbance;
  - b) Permanent organic soil cover; and
  - c) Diversified crop rotations in the case of annual crops or plant associations in case of perennials.



14 UNEP, 2011 (b). Towards a Green Economy. Agriculture: investing in natural capital:42.

15 Conventional farming, also known as industrial agriculture refers to methods of farming which use synthetic tools including chemicals, fertilisers, pesticides, and herbicides in the cultivation of crops

16 FAO, 2015a. What is conservation agriculture? <http://www.fao.org/ag/ca/1a.html>



**2. Integrated Pest Management (IPM)** is defined by the FAO<sup>17</sup> as the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment. According to FAO<sup>18</sup>, IPM emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.

**3. Organic farming:** is a production management system that aims to promote and enhance environmental health. It is based on minimising the use of external inputs (such as chemical fertilisers), and represents a deliberate attempt to make the best use of local resources, using methods that minimise adverse effects on the environment and on people. (<http://www.ifoam.org/en/organic-landmarks/principles-organic-agriculture>). Organic farming also has clear standards and certification to help ensure that its core practices are adhered to.

**4. Climate smart agriculture and adaptation** are key to project modification. The FAO<sup>19</sup> defines climate smart agriculture as an integrative approach to addressing the challenges of food security and climate change, and climate smart agriculture has three objectives:

- a) sustainably increasing agricultural productivity, to support equitable increases in farm incomes, food security and development;
- b) adapting and building resilience of agricultural and food security systems to climate change at multiple levels; and
- c) reducing greenhouse gas emissions from agriculture (including crops, livestock and fisheries).

Other relevant practices include permaculture and certifications such as Good Agricultural Practices (GAP). Some documents which provide information on the different practices are listed in Appendix 2.



17 FAO, 2015b. AGP-Integrated Pest Management. <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/ipm/en/>

18 FAO, 2015b. AGP-Integrated Pest Management. <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/ipm/en/>

19 FAO, 2014. FAO Success stories on climate smart agriculture. <http://www.fao.org/3/a-i3817e.pdf>



# PART 4

## REFERENCE LIST, APPENDICES AND FURTHER INFORMATION

### REFERENCE LIST

### APPENDICES:

Appendix 1: Indicative list of issues to cover in interviews/interactions to obtain information from those involved in projects (e.g. farmers, project managers)

Appendix 2: Sources of further information on the Green Economy

Appendix 3: Project Observation Guidelines and Observation Sheet

Appendix 4: Green Economy Screening and recording sheet

Appendix 5: Glossary of terms

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- UNEP, 2011 (b). Towards a Green Economy. Agriculture: investing in natural capital.



## APPENDIX 1:

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### Indicative list of issues to cover in interviews/interactions to obtain information from those involved in projects (e.g. farmers, project managers)

1. **What does the farm produce and for whom?**
2. **What jobs are created out of the farm and for whom?**  
Who are the different people who have jobs on the farm (men, women, disabled etc.)
  - a) How many people in each category are employed?
  - b) How many permanent and how many temporary?
3. **How is the farm constituted?** In other words, is there one owner, a group of owners?
4. **When decisions are made, who makes them and who enforces them?**
5. **Are there any capacity building programs or skills transfer?**
6. **Do you do any composting?**
7. **Are there any specific strategies in place that support water or energy conservation and efficiency of use?**
  - a) What do you do to conserve water?
  - b) What do you do to conserve electricity?
  - c) Do you use mulch?
  - d) Do you have specific times when you irrigate your crops?
8. **How does the farm deal with waste?**
  - a) Plant and food waste?
  - b) Recyclables – e.g. used oil, containers?
9. **Are there any “green” initiatives?**
10. **Do they in their day to day operations also try and protect biodiversity and ecosystems?** Yes – what?
  - a) E.g. are there any measures to prevent soil erosion?
  - b) What chemicals are used on the farm?
11. **How is the project funded?**
12. **Is the project self-sustaining?**
13. **What are the major problems the farm or farmer faces?**
14. **What advantages does your farm/project have?**
15. **What are the plans for the future?**



## APPENDIX 2:

### Sources of further information on the Green Economy

Type of material	Title of document	Reference
<b>Agriculture and the Green Economy</b>	<i>Agriculture and the Green Economy in South Africa: A CSIR analysis</i>	<a href="http://www.csir.co.za/nre/sustainability_science/docs/AGRICULTURE%20AND%20THE%20GREEN%20ECONOMY%20IN%20SOUTH%20AFRICA_01Dec2014.pdf">http://www.csir.co.za/nre/sustainability_science/docs/AGRICULTURE%20AND%20THE%20GREEN%20ECONOMY%20IN%20SOUTH%20AFRICA_01Dec2014.pdf</a>
	<i>Towards a Green Economy. Agriculture: investing in natural capital</i>	UNEP, 2011: <a href="http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/2.0-AGR-Agriculture.pdf">http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/2.0-AGR-Agriculture.pdf</a>
	<i>Towards a Green Economy: Pathways to sustainable development and poverty eradication.</i>	UNEP, 2011: <a href="http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/1.0-Introduction.pdf">http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/1.0-Introduction.pdf</a>
	<i>Greening the economy with agriculture.</i>	FAO, 2012: <a href="http://www.fao.org/docrep/015/i2745e/i2745e00.pdf">http://www.fao.org/docrep/015/i2745e/i2745e00.pdf</a>
<b>Crop-specific guidelines</b>	<i>Cultivation of garlic</i>	<a href="http://www.sagarlic.co.za/garlic_cultivation.html">http://www.sagarlic.co.za/garlic_cultivation.html</a>
	<i>Production guidelines for tomato</i>	<a href="http://www.nda.agric.za/docs/Brochures/ProdGuideTomato.pdf">http://www.nda.agric.za/docs/Brochures/ProdGuideTomato.pdf</a>
	<i>Tomato production guideline</i>	<a href="http://www.starkeyayres.co.za/com_variety_docs/Tomato-Production-Guideline-2014.pdf">http://www.starkeyayres.co.za/com_variety_docs/Tomato-Production-Guideline-2014.pdf</a>
	<i>Tomato (KZN)</i>	<a href="http://www.kzndae.gov.za/Portals/0/Horticulture/Veg%20prod/tomato.pdf">http://www.kzndae.gov.za/Portals/0/Horticulture/Veg%20prod/tomato.pdf</a>
	<i>Summer vegetables</i>	<a href="http://www.arc.agric.za/arc-vopi/Leaflets%20Library/Production%20Guideline%20for%20Summer%20Vegetables.pdf">http://www.arc.agric.za/arc-vopi/Leaflets%20Library/Production%20Guideline%20for%20Summer%20Vegetables.pdf</a>
<b>Guidelines for sustainable farming</b>	<i>Sustainable spinach: good agricultural practice guidelines</i>	<a href="http://www.unilever.com/Images/sustainable-spinach---good-agricultural-practice-guidelines--2003-_tcm13-387455_tcm244-409827_1.pdf">http://www.unilever.com/Images/sustainable-spinach---good-agricultural-practice-guidelines--2003-_tcm13-387455_tcm244-409827_1.pdf</a>
	<i>Sustainable rooibos initiative: a sustainable production strategy for the SA rooibos tea industry</i>	( <a href="http://www.sarooibos.org.za/downloads/rr/RBI_Sustainable_Production_Report_TonyHansen_2006.pdf">http://www.sarooibos.org.za/downloads/rr/RBI_Sustainable_Production_Report_TonyHansen_2006.pdf</a> )
	<i>The Green Choice Living Farms Reference (2010 update)</i>	Scotcher, 2010: <a href="http://awsassets.wwf.org.za/downloads/greenchoice_living_farms_reference_2009_2010.pdf">http://awsassets.wwf.org.za/downloads/greenchoice_living_farms_reference_2009_2010.pdf</a>
	<i>The Organic Business Guide: Developing sustainable value chains with smallholders</i>	IFOAM and collaborating organisations (Helvetas, Agro Eco Louis Bolk Institute, ICCO, UNEP) 2010
	<i>SAFA sustainability assessment of food and agriculture systems: guidelines</i>	FAO, 2014: <a href="http://www.fao.org/3/a-i4113e.pdf">http://www.fao.org/3/a-i4113e.pdf</a>

Type of material	Title of document	Reference
<b>Business plan guidelines</b>	<i>Agricultural Business Plan Guidelines</i>	DAFF, (2011): <a href="http://www.daff.gov.za/doaDev/AgricDevFinance/BusinessPlanGuidelines(VIS).pdf">http://www.daff.gov.za/doaDev/AgricDevFinance/BusinessPlanGuidelines(VIS).pdf</a>
	<i>Building a Business Plan for Your Farm: Important First Steps</i>	Jones, R. 2003: <a href="http://www.agmanager.info/farmmgmt/planning/Building_a_Plan_for_Your_Farm.pdf">http://www.agmanager.info/farmmgmt/planning/Building_a_Plan_for_Your_Farm.pdf</a>
<b>Guidelines for investors</b>	<i>Guidelines for Sustainable Agriculture and Bioenergy Investment</i>	Government of Sierra Leone and FAO, (2013): <a href="http://www.fao.org/energy/39236-0c8648696dd1c2302a98a613391200e1e.pdf">http://www.fao.org/energy/39236-0c8648696dd1c2302a98a613391200e1e.pdf</a>
	<i>Guidelines for Climate Proofing Investment in Agriculture, Rural Development, and Food Security</i>	Asian Development Bank, 2012: <a href="http://www.adb.org/sites/default/files/institutional-document/33720/files/guidelines-climate-proofing-investment.pdf">http://www.adb.org/sites/default/files/institutional-document/33720/files/guidelines-climate-proofing-investment.pdf</a>
<b>Climate Smart Agriculture</b>	<i>FAO Success stories on climate smart agriculture</i>	FAO, 2013: <a href="http://www.fao.org/3/a-i3817e.pdf">http://www.fao.org/3/a-i3817e.pdf</a>
<b>Permaculture</b>	<i>Essence of Permaculture</i>	<a href="http://holmgren.com.au/downloads/Essence_of_Pc_EN.pdf">http://holmgren.com.au/downloads/Essence_of_Pc_EN.pdf</a>
<b>Good Agricultural Practices</b>	<i>Guidelines "Good Agricultural Practices for Family Agriculture"</i>	FAO, 2007: <a href="http://www.fao.org/3/a-a1193e.pdf">http://www.fao.org/3/a-a1193e.pdf</a>
<b>Conservation Agriculture</b>	<i>What is conservation agriculture?</i>	FAO, 2015: What is conservation agriculture? <a href="http://www.fao.org/ag/ca/1a.html">http://www.fao.org/ag/ca/1a.html</a>



## APPENDIX 3:

### Project Observation Guidelines and Observation Sheet

This observation sheet is for recording what you can see – your own impressions independently of what the farmers or those central to the project say.

Theme	Guiding questions	Observation
<b>Social equity and inclusivity: Livelihoods and jobs</b>	<i>How many people do you see working on the farm?</i>	
<b>Resource and energy efficiency</b>	<i>Irrigation system (drip or furrow) (water use efficiency)</i>	
	<i>Energy for pumping water – diesel or electricity (carbon footprint)</i>	
	<i>Any tractors on farm? (Carbon footprint)</i>	
	<i>Any composting taking place on the farm –is there a compost heap (waste management and recycling)?</i>	
<b>Low carbon and environmental protection</b>	<i>Are there any environmental problems that you see e.g. soil erosion, air pollution, water pollution?</i>	
	<i>Do you see bags/containers of chemical fertilisers and other such inputs</i>	
	<i>Do you see used oil/diesel containers lying about, or perhaps recycling facilities for these containers?</i>	
	<i>Do you observe anything related to how they handle organic waste (e.g. plant or food residues)</i>	



Theme	Guiding questions	Observation
<b>Social equity and inclusivity:</b> <b>Governance and participation</b>	<i>Numbers of women and men working on the farm in different capacities – (managing the farm and labourers)</i>	
	<i>Any young (young is subjective – but people who look younger than 35) working on farm (if possible specify number, gender and capacity they work in)</i>	
	<i>Are there any differently abled people working on the farm?</i>	
<b>Perspectives on the project's general operating environment</b>	<i>What crops do you see (list what you see and get full list of what is grown from farmer)</i>	
	<i>What specific operations are taking place e.g. irrigation, harvesting planting, weeding</i>	
	<i>Any aspects of interest that you observe but are not addressed in the themes above e.g. crops that show evidence of livestock damage; crops drying due to lack of irrigation</i>	





## APPENDIX 4:

### Green Economy Screening and recording sheet

PROJECT NAME:

Criteria	Yes	No	Not sure	Notes
<b>Social equity:</b> Job creation (job= source of livelihood not merely income)				
Direct participation of more than one family? ... number of people	Yes			
Is there opportunity for job creation in the value chain (e.g. Processing, drying etc.)	Yes			
Secure jobs – Some kind of contract or written agreement in place				
Safe jobs – Does not put the health of the individual in danger				
Green jobs - Does not put the health of the environment in danger				
<b>Resource efficiency:</b> Project uses resources efficiently – reduces water or other resource consumption (which resource?)				
Energy resources				
Water resources				
Conserves land/soils				
Other (specify)				
Waste minimisation				
How much water (litres or in monetary value [rand] is used for each tonne of crop produced?				
How much energy (e.g. litres of diesel or in monetary value) is used for each tonne of crop used?				
How much fertiliser (in monetary value ) is used for each tonne of crop produced?				
<b>Low carbon and environmental protection:</b> Protection of biodiversity and ecosystems				
Project has practices which protect biodiversity and ecosystems				
Project has practices which protect physical resources such as water and soils				

Criteria	Yes	No	Not sure	Notes
<b>Social equity and inclusivity: Governance and participation</b>				
Project is inclusive (gender, age)				
Democratic decision making processes are in place				
Participatory decision making processes are in place				
Processes for ensuring accountability (to stakeholders) are in place				
Processes for ensuring justice and fairness are in place (e.g. Recruitment/ dismissal processes are transparent and fair)				
Are projects socially inclusive (who participates and benefits?)				
<b>Social equity and inclusivity: Addressing inequality</b>				
Previously disadvantaged people are participating				
Women are participating				
Skills development takes place				
Youth participation and employment is in place				
Differently abled people are participate				
<b>Rural and local economic development</b>				
Links to local industry				
Participation in value chains (e.g. Drying produce before sale)				
Participating in local industry networks (e.g. Co-operative)				
<b>Long term economic viability</b>				
Linked to local markets				
Linked to national markets				
Linked to international markets				
Generates income consistently (is the initiative operational throughout the year?)				
Net income of each enterprise of the project (total of all operating cash inflows and outflows)				
Number of different markets supplied by the project				
Number of different products marketed by the project				

## APPENDIX 5: Glossary of terms

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### **Agroecology:**

Agroecology is concerned with the maintenance of a productive agriculture that sustains yields and optimises the use of local resources while minimising the negative environmental and socio-economic impacts of modern technologies (Silici, 2014).

### **Biodiversity:**

Biodiversity (or biological diversity) refers to all the variety of life that can be found on earth (plants, animals, fungi and micro-organisms) as well as to the communities that they form and the habitats in which they live (Convention on Biological Diversity, 2007).

### **Climate-smart Agriculture:**

An integrative approach to address the interlinked challenges of food security and climate change, that explicitly aims for three objectives: (1) sustainably increasing agricultural productivity, to support equitable increases in farm incomes, food security and development; (2) adapting and building resilience of agricultural and food security systems to climate change at multiple levels; and (3) reducing greenhouse gas emissions from agriculture (including crops, livestock and fisheries)

<http://www.fao.org/climatechange/climatesmart/en/>

### **Conservation agriculture (CA):**

CA is a resource-saving approach to crop production which strives to achieve high and sustained production levels together with acceptable profits while concurrently conserving the environment. CA applies three linked principles, namely (1) Continuous minimum mechanical soil disturbance; (2) Permanent organic soil cover; and (3) Crop rotations - diversified crop species grown in sequences and/or associations. CA is based on enhancing natural biological processes above and below the ground. (Source: FAO, 2015; UNEP, undated).

### **Decent work:**

According to the International Labour Organization (ILO) (2014), 'decent work involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organise and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men'. In the South African context, the Department of Environmental Affairs (DEA, 2007) points out that decent work should offer adequate wages, safe working conditions, job security, reasonable career prospects and worker rights.

### **Food security:**

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 1996). Food security consists of several elements:

- The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports;
- Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet (entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live; including traditional rights such as access to common resources).
- Utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.
- Stability in food provision so that populations, households or individuals have access to adequate food at all times and are more resilient to sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity).

FAO's policy brief on food security: [ftp://ftp.fao.org/es/ESA/policybriefs/pb\\_02.pdf](ftp://ftp.fao.org/es/ESA/policybriefs/pb_02.pdf)

### **Energy efficiency:**

Energy efficiency refers to using less energy to produce the same amount of services or useful output (Patterson, 1996)

### **Energy intensity:**

Energy intensity a measure of the energy required per unit of output or activity (National Academy of Engineering and National Research Council, 2008 [161]).

**Greenhouse gas (GHG) emissions:**

Human activities such as the burning of fossil fuels, changes in land use, deforestation and other activities release greenhouse gases into the atmosphere. The main anthropogenic greenhouse gases (gases emanating from human activities) are carbon dioxide, methane and nitrous oxide, with the main greenhouse gas being carbon dioxide. The increasing concentrations of greenhouse gases in the atmosphere are disturbing the earth's natural temperature control mechanism resulting in the warming of the earth's atmosphere- a phenomenon commonly referred to as 'global warming'. This warming in turn disrupts the earth's climate system resulting in climate change.

**Green jobs:**

Green jobs are decent jobs that contribute to the preservation or restoration of the environment. These jobs could be in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency (ILO, 2013). South Africa's Department of Environmental Affairs (DEA, 2007) notes that green jobs can be defined as work in spheres such as agriculture, manufacturing, research and development, administration and the service industry. The jobs should be geared specifically to contribute substantially to preserving or restoring environmental quality for example protecting ecosystems and biodiversity, reducing energy, water and materials consumption, decarbonise the economy and minimise (in the least) all forms of waste and pollution (DEA, 2007).

**Human well-being:**

Human well-being is a multidimensional concept which is about the quality of peoples' experiences of life. While the concept varies from person to person, there are universal tenets of well-being such as enough food at all times and health. The Millennium Ecosystem Assessment (MA) (2003) defines well-being as a context and situation- dependent state, comprising basic material for a good life, freedom and choice, health, good social relations (e.g. social cohesion, mutual respect) and security (e.g. secure access to natural and other resources, personal safety).

**Indicator:**

An indicator is an instrument that provides an indication, generally used to describe and/or give an order of magnitude to a given condition. Indicators provide information on the historical and current state of a given system, and are particularly useful to highlight trends that can shed light on causal relations among the elements composing the system. Both quantitative and qualitative information can be used to define an indicator, depending on the issue that needs to be analysed, as well as on the availability and quality of data (UNEP, 2014). <http://www.unep.org/greeneconomy/Portals/88/documents/PAGE/IndicatorsWorkingPaper.pdf>

**Low carbon:**

Low carbon in the context of an agricultural project is making choices (including procurement, practices and methods) which are consistent with low levels of greenhouse gas emissions.

**Minimum tillage:**

A production system in which soil cultivation is kept to the minimum necessary for crop establishment and growth, thereby reducing inputs such as labour and fuel and possible damage to soil structure. (<http://davesgarden.com/guides/terms/go/3269/#b>)

**Mulch:**

A mulch is a layer of material (this could be organic or inorganic) applied to the surface of a soil (it may be applied to bare soil or around existing plants). A mulch can serve the following purpose(s):

- conserve/retain soil moisture;
- regulate soil temperature;
- suppress weed growth;
- improve soil fertility;
- decorative – to enhance the visual appeal of an area.

**Productivity:**

Although agricultural output is defined in several ways, a common definition is that it is a measure of the amount of agricultural output produced for a given amount of inputs, e.g. the value of all farm outputs divided by the value of all farm inputs; farm yield by crop or total output per hectare, and output per worker (Schneider and Gugerty, 2011)

**Sustainable agriculture:**

Sustainable agriculture is the production of food, fibre or other plant or animal products using farming techniques that protect the environment, public health, human communities, and animal welfare. This form of agriculture aims to produce healthy food without compromising the ability of future generations to do the same. <http://www.sustainabletable.org/246/sustainable-agriculture-the-basicsSustainable>













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