Climate Smart Agriculture in South Africa

E-Course

Syllabus

Context

The European Union (EU) funded SWITCH Africa Green Programme is implemented by the United Nations Environment Programme (UNEP). The main aim is to support African countries in achieving sustainable consumption and production (SCP) practices in their transition to a green economy. The Department of Forestry, Fisheries and the Environment (DFFE) has been appointed the national coordinating entity for the implementation of the SWITCH programme in South Arica.

One of the key policy components of promoting SCPs is transitioning from conventional to climate-smart agriculture (CSA). CSA offers an integrated approach to managing cropland, livestock, forests and fisheries that address the interlinked challenges of food security and climate change (World Bank, 2021). CSA aims to simultaneously achieve three outcomes: 1) increased productivity; 2) enhanced resilience; 3) reduced emissions.

The United Nations Framework Convention on Climate Change estimates that temperatures in Africa are set to rise significantly in coming years, with devastating results for farmers. Regions in South Africa will experience more frequent droughts. However, CSA can help mitigate the effects of climate change, for both farmers and the nature In South Africa. For example, practices which increase soil moisture levels and soil biodiversity have been shown to decrease soil erosion by up to 64% and increase maize yields by 136%.

This e-course supports learning on climate-smart agriculture in South Africa and provides participants with an introduction to key concepts and application opportunities. The course has been developed in close collaboration with the United Nations Institute for Training and Research (UNITAR) and is offered on the UN CC:Learn platform.

Target Audience

The course is geared towards anyone who is interested in the basics of the CSA and/or individuals involved in the agriculture sector in South Africa looking to enhance knowledge and skills regarding the subject.

Specifically, the course should benefit representatives from:

- Professionals from national, provincial, local investment, agriculture, economic, labour, environment departments;
- Extension workers, farmers, professional associations;
- Non-Governmental Organisations (NGOs), academia and business representatives.

Learning Objectives

The overall objective of this work is to strengthen human resource capacities in South Africa and raise awareness of key stakeholders on Climate Smart Agriculture concepts, techniques and tools.

The concrete expected results from this work include:

- Development of a user-friendly, interactive, self-standing e-course based on the CSA guidelines;
- Course deployment on the UN CC:Learn platform and potentially other learning platforms in South Africa;
- Creation of a CSA community in South Africa within the first months of the course launch

After completing the course, participants will be able to:

- Explain what CSA is, including main principles, objectives, and benefits
- Identify key social, environmental, and economic opportunities for CSA in the South African
- Describe applications of SCA in various agricultural domains, such as livestock and croplands
- Discuss the role of remote sensing and identify practical steps to apply CSA in South Africa
- Discuss enabling conditions for the adoption of CSA in South Africa.

The course is based on the "Actionable guidelines for the implementation of Climate Smart Agriculture in South Africa", Volume 1 and Volume 2, recently developed by the DFFE in the framework of the Switch Africa Green Project.

Structure and Key Characteristics

LENGTH	4 THEMATIC MODULES
EFFORT	1,5 HOURS PER MODULE
PRICE	FREE
SUBJECT	CLIMATE SMART AGRICULTURE
LEVEL	INTRODUCTORY
LANGUAGE	ENGLISH
PLATFORM	UN CC: E-LEARN
COMPLETION CRITERIA	4 MODULE QUIZZES (70% MIN) 4 ONLINE LESSONS COMPLETED
CERTIFICATION	YES

The course is structured around four thematic modules. Each module has specific learning objectives and features key information on aspects of CSA in South Africa, as well as complementary resources such as videos, case studies and a discussion forum. The course is self-paced and not moderated (see below Methodology section for more information).

Three **online trainings** have been provided in February 2022 to test the interest in the topics among professionals from the agriculture sector and to allow participants to interact with the course instructors. These trainings will be recorded and made available online.

The following are the themes and main topics of the four modules including learning objectives.

Module 1: PRINCIPLES OF CLIMATE-SMART AGRICULTURE

Module 1 provides an introduction to the concert, rationale and principles of climate-smart agriculture, as well as an overview of the current situation in South Africa. You will learn:

After completing Module 1, participants will be able to:

- Define climate change and its impact on agriculture
- Identify key impacts of agriculture on climate change
- Discuss climate-smart agriculture strategies
- Outline challenges and opportunities for the agricultural sector in South Africa

Module 2: CLIMATE-SMART CROP PRODUCTION

The second module explores how CSA differs from mainstream agriculture in crop production and why it is essential to adopt CSA given the impact of climate change. Learners will explore different practices used in CSA including: how to conserve soil and water as natural resources, enhance crop production at minimal negative impact to the environment, minimise greenhouse gas emissions in crop production systems, apply integrated pest control, fertiliser management, and crop adaptations techniques and more.

After completing Module 2, participants will be able to:

- Describe what is climate-smart crop production and key mitigation and adaptation strategies
- Discuss the importance of soil and water conservation
- Identify effective and sustainable pest management approaches in crop production
- Explain how conservation agriculture is important in crop production

Module 3: CLIMATE-SMART LIVESTOCK PRODUCTION

The third module focuses on livestock production. It explores the importance of livestock production for food security, the link between climate change and livestock production, ways to adapt livestock production to climate change. Learners will explore the different climate smart livestock techniques including: climate change mitigation approaches through livestock production, the importance of feed management, the influence of climate change on pests and diseases, waste management in livestock production, and generating clean energy in livestock production and more.

After completing Module 3, participants will be able to:

- Discuss the interrelated effects of climate change and livestock production
- Identify climate smart livestock techniques and approaches
- Discuss how to implement climate smart livestock production in practice in different context
- Elaborate on the enabling condition for the adoption of climate smart livestock production

Module 4: REMOTE SENSING

The fourth module introduce students to basic remote sensing concepts and their applications in agriculture. Students will gain an understanding and practical knowledge of basic remote sensing and how this technique can be used to enhance adaptation and mitigation strategies.

After completing Module 4, participants will be able to:

- Explain basic principles of remote sensing and types of remote sensing techniques
- Identify remote sensing data and methods that can be used to monitor crops and livestock.
- Discuss how open-source software (such as Google Earth Engine) can be a source of remote sensing data.
- Appreciate how remote sensing data can be used to advance climate smart agriculture.

Methodology

Learning Approach

The course is self-paced and not moderated. It consists of three thematic modules. The modules are self-standing, and they each have specific learning objectives and contain information on specific aspects of CSA (as described above). Each module is subdivided into several learning units covering different topics. They can be accessed in random order.

E-books / Interactive lessons

Small e-books relating to each module's leaning units are made available to participants as background reading on the online platform. The e-books are based on the "Actionable guidelines for the implementation of Climate Smart Agriculture in South Africa", Volume 1 and Volume 2, referenced above, and contain the content and information that directly corresponds to the learning objectives of the course. The PowerPoints developed for the online webinars will be used as a basis for the interactive lessons. The e-books are available as a downloadable PDF version to allow offline learning.

Videos Clips

The e-books and learning units will be accompanied by short informative online video clips by substantive experts, where available and relevant. The video clips aim to provide further insights and information, and to make the course content livelier.

Discussion boards /polls

The course will feature an element of social interaction, allowing participants to voice their opinion, share experiences, and learn from their peers. There will be one element in each of the three course, which may be a discussion board to answer a specific question, or a poll (the results of the poll are made available to learners after the give their response).

Assessment Tests

At the end of each module, participants take a test of 10 multiple choice questions each to assess the knowledge gained. The questions relate to the content and learning objectives of the module. They aim to appraise the comprehension of key facts and concepts presented during the course. Moreover, the course is concluded with a final test of 10 multiple choice questions, which cover all the materials presented across the three thematic modules.

Completion and Certification

To receive a *Certificate of Completion*, participants need to conduct a number of assessments as detailed above. For each assessment test, participants will be allowed 3 attempts. A certificate of completion is awarded to learners who complete the following:

- Three thematic modules assessments are complete with 70% or higher score
- Final assessment is complete with 70% or higher score

The certificate will be available upon successful completion of the course and is issued by UNITAR.