



**Food Security and Biotechnology in Africa**



This project is financed by the European Union  
and implemented by the ACP Secretariat

# MODULE 2

## BIOTECHNOLOGY:

### History, State of the art, Future

**Dr Marcel Daba BENGALY**  
**Université Ouaga I Pr Joseph KI ZERBO**



## Disclaimer

*This publication has been produced with the assistance of the European Union. The contents of this publication is the sole responsibility of the University of Ouaga-I JKZ and can in no way be taken to reflect the views of the European Union.*

*Final Version : February 2017*

## General objective

The main objective is to offer a broad view of biotechnology, integrating historical, global current and future applications in such a way that its applications in Africa and expected developments could be discussed based on sound knowledge...

## Specific objectives

At completion learner should be able to:

- demonstrate knowledge of essential facts of the history of biotechnology and description of key scientific events in the development of biotechnology
- demonstrate knowledge of the definitions and principles of ancient, classical, and modern biotechnologies.
- describe the theory, practice and potential of current and future biotechnology.
- describe and begin to evaluate aspects of current and future research and applications in biotechnology.

- Unit 1 Introduction to biotechnology, history and concepts definition
- Unit 2: The Green Revolution: impacts, limits, and the path ahead
- Unit 3: Agricultural biotechnology: the state-of-the-art
- Unit 4: Future trends and perspectives of agricultural biotechnology
- **Unit 5: Food security and Biotechnology in Africa: options and opportunities**

**UNIT 5:**  
**Food security and Biotechnology**  
**in Africa: options and opportunities**  
**(03 Hours)**

**Dr Marcel Daba BENGALY**  
Université Ouaga I Pr Joseph KI ZERBO



The objective is to present an overview of Food Insecurity Africa and to discuss the importance of sustainable agriculture in Africa as a key to achieve food security focusing on current and future technologies to increase productivity that are accessible, appropriate and adapted to the needs of smallholders.

- 1. Overview of Food Insecurity in Africa**
- 2. Case study**
- 3. African Food Security Prospects**

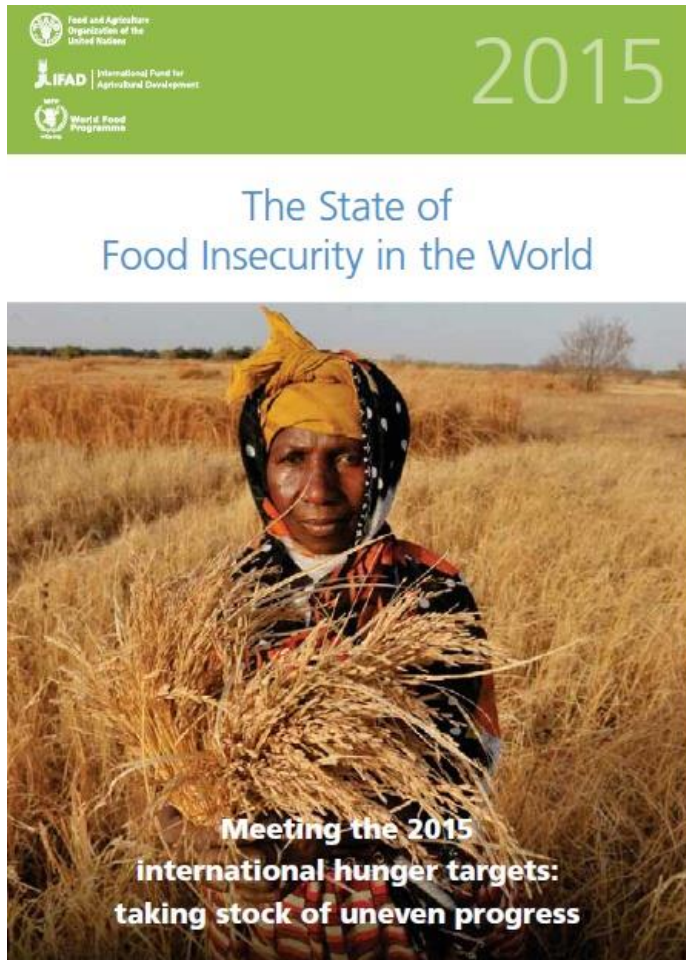


In line with the 2015 deadline set for achieving the Millennium Development Goal targets, Sub-Saharan Africa (SSA) made some progress towards halving the proportion of its population suffering from hunger (MDG 1.C target). Overall, the prevalence of hunger in the region declined by 31% between the base period (1990-92) and 2015.

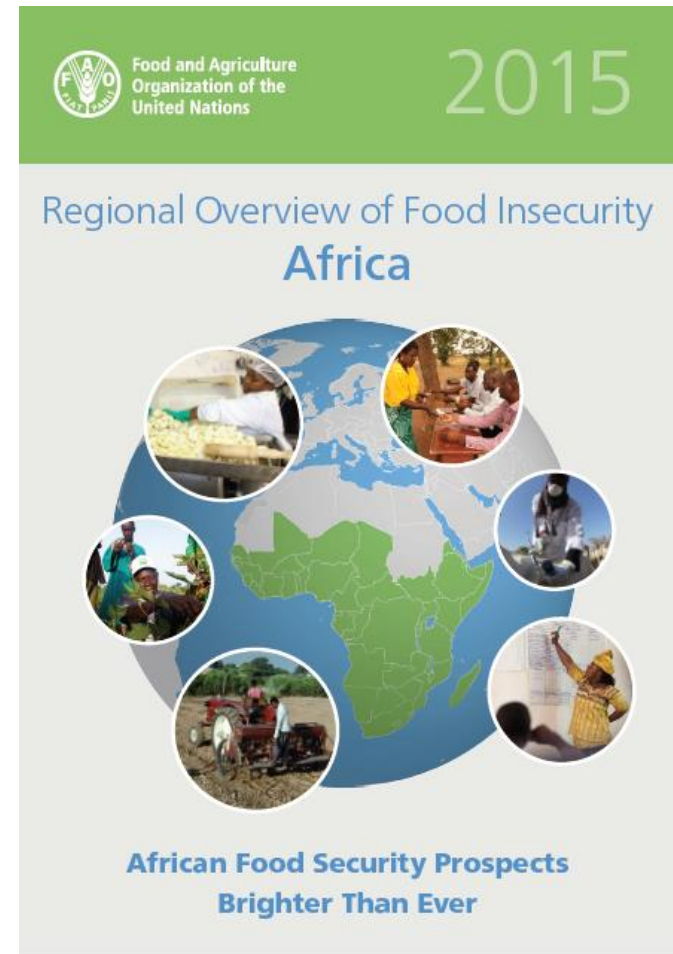
In other words, approximately one person out of four in SSA is estimated to be undernourished today compared to a ratio of one out of three in 1990-92.

FAO, 2015

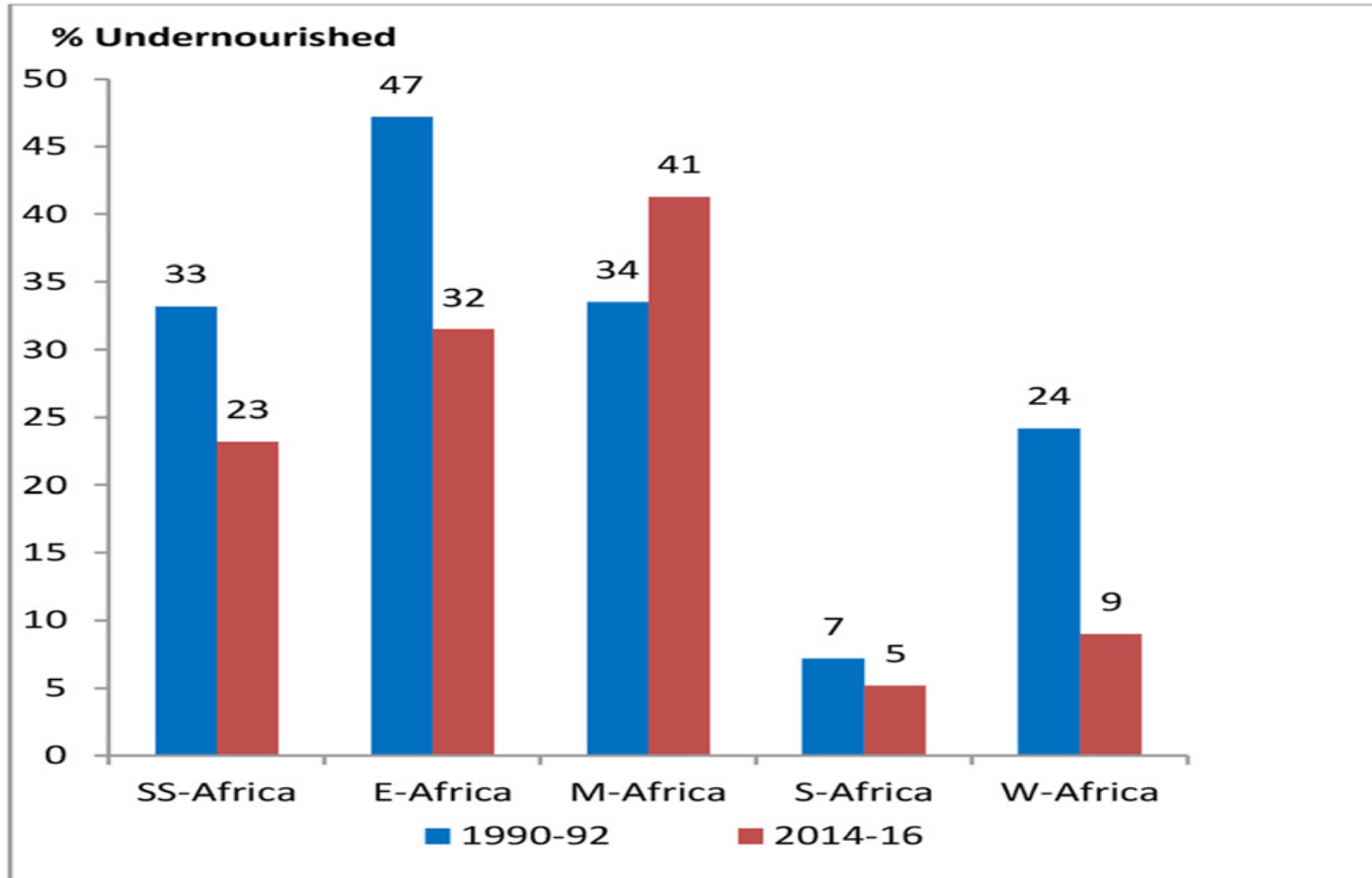
Read and synthesize FAO reports on the state of food insecurity in the world and in Africa



<http://www.fao.org/3/a-i4646e.pdf>



<http://www.fao.org/3/a-i4635e.pdf>



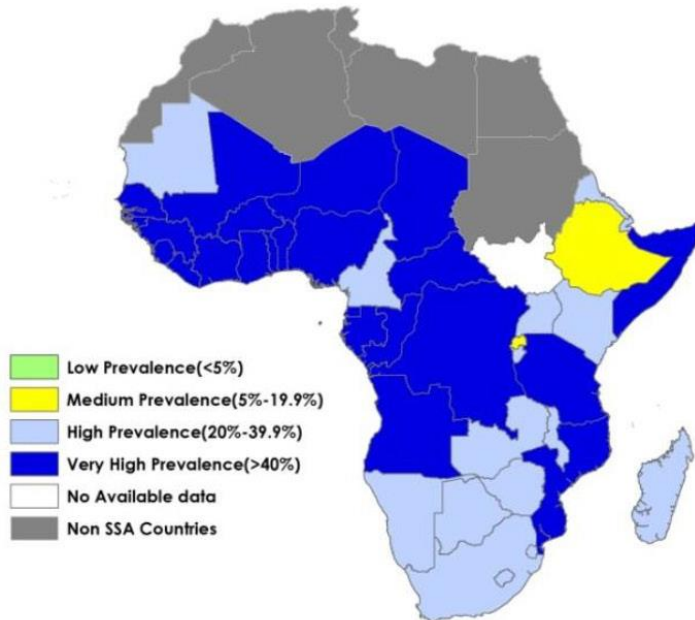
**Figure 1: Prevalence of undernourishment in SSA (1990-92 and 2014-16)**

Sub-region	Number of undernourished (millions)		Change so far (%)
	1990-92	2014-16	
Eastern Africa	103.9	124.2	19.6
Middle Africa	24.2	58.9	143.7
Southern Africa	3.1	3.2	2.3
Western Africa	44.6	31.5	-29.4
<b>SS-Africa</b>	<b>175.7</b>	<b>217.8</b>	<b>23.9</b>

**Table 1: Number of undernourished (millions), 1990-92 and 2014-16**

## Prevalence of anemia in reproductive women and stunting in children under five years in Sub-Saharan Africa

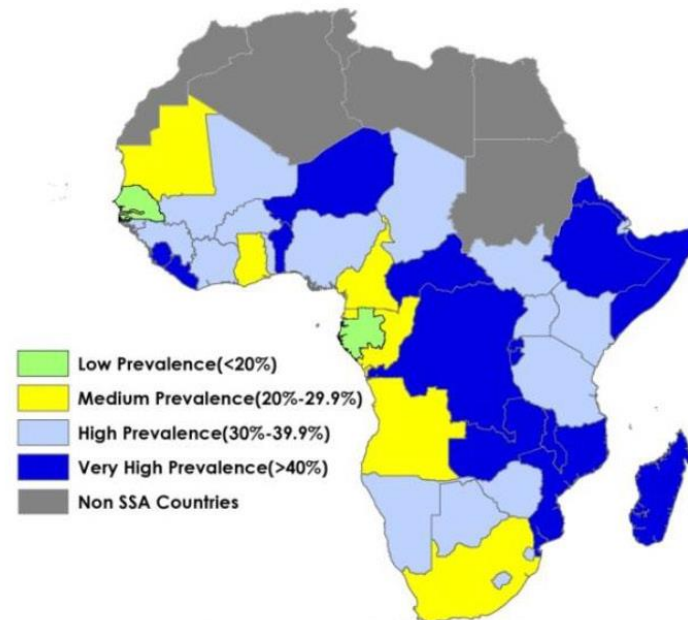
Anemia



Source: Global Nutrition Report ( Estimate 2014)

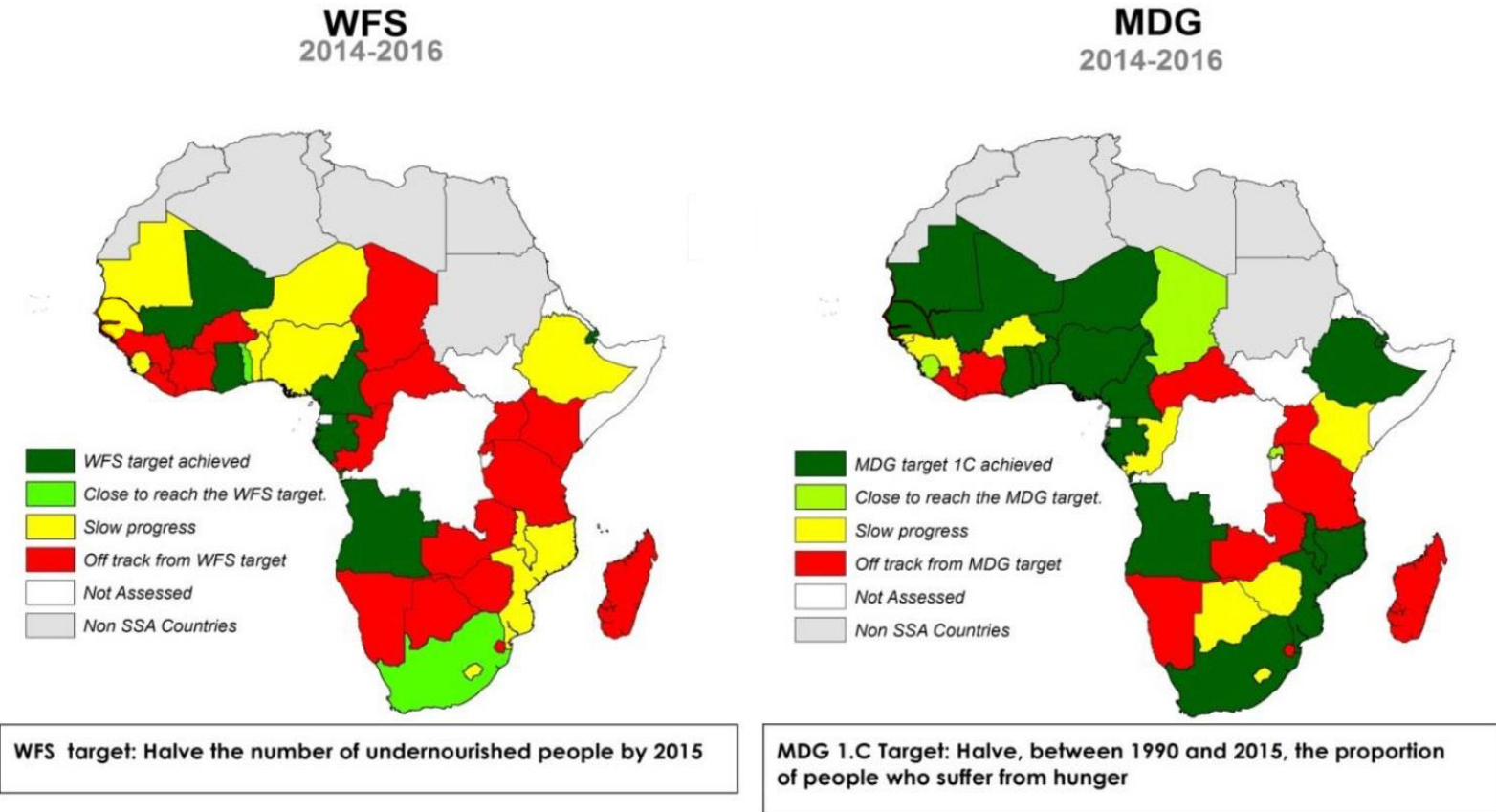
©RAF Database Unit

Stunting



Source: Global Nutrition Report ( Estimate 2014)

## Progress towards the World Food Summit (WFS) and Millennium Development Goal (MDG) targets in Sub-Saharan Africa (SSA)



## Case study

Based on international and national reports and statistics, analyze the state of food insecurity in your country.

### Analysis plan :

1. Context of the Country
2. Agricultural production and food availability
3. Market structure and food accessibility
4. Food insecurity, malnutrition and health
5. Challenges and prospects for food security

Examples of Reports  
relevant to the case of  
Burkina Faso



Key issues facing African agriculture in the coming decade include: the challenge for the agri-food system to provide for the changing food and nutrition requirements of the evolving population, economic inequality and poverty in rural areas, high population growth without foreseeable demographic transition, maintaining control over coveted natural resources, and the impacts of globalization on Africa agriculture, such as climate change, globalization of markets and the search for new sources of green energy...

FAO, 2015



## These challenges : Accelerate sustainable agricultural growth

To achieve the most direct reduction of hunger, priority must be given to economic growth in the agricultural sector which hosts the majority of the poor, and has proved to be more effective in reducing poverty than either the manufacturing or service sector...

## These challenges : Promote structural transformation

A key challenge consists of modernizing the agri-food system in order to compete in increasingly competitive national, regional and global markets, while providing livelihood, employment and entrepreneurship opportunities to a diverse and young population.

Modernization of smallholder agriculture and its integration into the fast-growing agribusiness chains, which can produce quality products that meet the rapidly evolving urban demand (food quality, convenience, safety...)

**These challenges : Address livelihood risks and uncertainties**

African farmers face harsh agroecologies and erratic weather, characterized by low soil fertility, recurrent droughts and/or floods. The region is also affected by extreme climate events such as unusual rainfall and temperature patterns. Plant and animal diseases are also a growing threat in Africa...

Agricultural risk management strategies, social protection programs, integrated adaptation and mitigation approaches are required to ensure resilient livelihoods and achieve food and nutrition security.

## Discussion topics

What may be the role of **biotechnology** in ensuring **food security** and sustainable agriculture in Africa ?

Supporting reading on biotechnology & food security in Africa

