



Food Security and Biotechnology in Africa



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Module 6

TAILORING BIOTECHNOLOGIES: TOWARDS SOCIETAL RESPONSIBILITY AND COUNTRY SPECIFIC APPROACHES

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For detail see word document and supporting PDF materials



Course Structure

 Unit 1: Technology and innovation to the rise of biotechnology: 5 hours

 Unit 2: Policy-making and communication: 3 hours

 Unit 3: Value chain, agribusiness, local and global development: 3 hours

 **Unit 4: Stakeholder participation: 3 hours**

 Unit 5: Case studies of tailor-made biotechnology in specific countries: 6 hours

The final version of this module is on February 28th, 2017

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Objective of module 6

The objective of this module is to allow students to understand how the innovation and policy making lead to tailor-made of both classic and modern versions of biotechnology to the needs and customs of specific countries. Tailoring biotechnology involves that stakeholders can use the tool within their own context and on their own conditions and have the opportunity to fulfil the required social, financial, ethical and other conditions for the implementation of the new technology.

Specific Objectives

- ❖ Find the multiple currently available technologies and innovation and how they contribute to the rise of biotechnology.
- ❖ Understand the role of policy-making and media on adopting biotechnology
- ❖ Know how global and local value chain represent for local firms and suppliers in the countries to get access to larger markets and new technologies.
- ❖ The importance and the role of stakeholder perceptions, internalization and appropriation in the process of biotechnology for development.
- ❖ Discover current experience throughout case studies of African countries that apply GMO crops.



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6.4. Unit 4 .Stakeholder participation

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The objective of this unit is to analyse the role of the stakeholder perceptions, internalization and appropriation in the process of biotechnology for development.

Biotechnology stakeholders can be enumerated as follow:

- scientists (universities, research institutes, etc.),
- policy makers (ministries, UN organizations, etc.),
- regulatory agencies,
- legislators (parliaments, senators),
- civil society,
- community based society,
- donors (NGO's, bilateral and multilateral agencies),
- farmers,
- industrialist and end-users (consumers).

Stakeholder involvement and public engagement

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Potential benefice of the technology for stakeholders

Biotechnology is expected to play an important role in transforming the economy from a predominantly agricultural one with low productivity to a diversified and semi-industrialized economy with a modern rural sector and high productivity in agricultural production that generates reasonably high incomes and ensures food security and food sovereignty.



Stakeholder involvement and public engagement

Stakeholders involvement on internalization and appropriation in the process of biotechnology:

The role of the stakeholder participation, internalization and appropriation in the process of biotechnology development is very important for the adoption of the technology.

The attitudes and interests of stakeholders involved in national public debates on the risks and benefits of genetically modified crops have significant influence on public opinion as well as public policy outcomes related to the use of genetically modified organisms (GMOs) in agriculture.

Perception of the technology by different stakeholder groups

Some African countries are making some effort to build a national capacity in biotechnology in terms of the physical human organizational or institutional resources.

Stakeholder involvement and public engagement

The importance of the functions of each category of stakeholder generally connects to the other.

It is important that all stakeholders are addressed properly for the realization of the systematic synergy required for making the desired impact of biotechnology.

In several African countries, the survey on key stakeholder groups indicated that successful production of GM crops is due to the availability of effective biosafety regulatory frameworks and extensive capacity building on modern biotechnology research and development (R&D). These were accompanied by adequate training of farmers such as the AfricaBio initiative in South Africa.

Stakeholder involvement and public engagement

Most of African stakeholders found that the adoption of GM crops is relatively high among commercial and small-scale farmers due :

- to the benefits of high-yielding varieties,
- disease-resistant traits and herbicide tolerant traits;
- reduction of labor;
- low exposition to pesticides, etc,

Stakeholder involvement and public engagement

Discussions with cotton breeders in Burkina Faso in the framework of this course development also revealed that those stakeholders prefer Bt cotton rather than the wild type for the same reasons.

The main disadvantage using GM-crops remains the dependence on seeds to international firms such as Monsanto.

Safety issues and precautionary principles

End-users of biotechnology products are paramount to biotechnology activities, since they are key persons for the adoption and appropriation of the technology.

Current study on views and positions of stakeholder groups in Africa with respect to GM crops revealed that small farmers are willing to adopt new technology

However, food safety; preservation of the ecological balance and the environment; socio-economic considerations; regulatory aspects and intellectual property rights (patents); and ethical aspects are the major concern of public.

Stakeholder involvement and public engagement

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Safety issues and precautionary principles

Safety issues addressed the avoidance of risk to human health and care, and to the conservation of the environment.

The important concern of public is the limited capacity and lack of scientific expertise or trust of the existing one particularly with regard to the risk analysis of GM products.

Thus, the need **to label GM foods is often raised** for some public. This is a controversial issue. While some people think that labelling must be in place to ensure consumers know what they are eating others don't think this necessity. In Burkina Faso, GMO labelling is mandatory, while in South Africa it is not obligatory.

Precautions of gene flow

Gene flow refers to the introgression of genes or genetic materials from one plant population into another.

There are concerns that the integration of transgenes from a

Biotech crop into its non **GE** counterpart and/or wild or weedy relatives (crop to wild relative) could trigger a range of possible

environmental consequences.

The strict respect of the CPB is important to limit gene-flow.

Stakeholder involvement and public engagement

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Food security and improved quality of life of farmers should be targeted as ultimate socio-economic impacts for products resulting from the application of GMOs in Africa.

Thus GM technology has to make his impact more visible on food security after one decade of implementation in some African countries.

Stakeholders should be sensitized to understand the technology and its potential impact to enable them contribute to its development.

A **consensus** may be needed to regulate GMO products and controversy surrounding the its adoption.

Indigenous knowledge and adoption of new technology

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Indigenous knowledge

For agricultural biotechnology to be effective, it must be based on clear and realistic research priorities based not only in formal science but also taking into account indigenous knowledge.

Lack of pragmatic approach may result in limited biotechnology adoption.

The potential of biotechnology can only be realized if due attention is paid to the whole array of policies and programs needed for sustainable development.

Strategies of adoption of the new technology with endogenous knowledge

A study views and positions of stakeholder and NGO on some African countries revealed that among strategies for GMO adoption, countries may go through a **Fiber–Feed–Food (F3)** approach to adopt GM crops.

This means that Bt cotton will be adopted first crops for livestock feed while undergoing all the necessary assessments before producing GM foods for human consumption.

Strategies of adoption of the new technology with endogenous knowledge

There is a need to mobilize stakeholders including both the public and private sector, and to have a correct perception of the problem for which the biotechnology is developed for adoption and diffusion of new technology.

- Food security and GMOs-why and how?
- Research capacity for GMOs?
- Risk analysis/control of GMOsby whom and how?
- Development and regulations of GMOs by whom and how?
- Application of biosafety regulatory system-how?
- Decision-making for GMOs by whom and how?
- Field tests and adoption of GMOs how and when?
- Awareness creation for GMO products how and when?
- Problems affecting the use of GMO show?
- Transfer of GMO technology how?
- Prioritization of GMOs in agricultural policies-how?