

**Major technological, natural resource and environmental, socio-economic, policy and institutional constraints to agriculture, forestry and fisheries development and sustainability in West and Central Africa**

By

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## **Introduction:**

The countries of West and Central Africa (WCA) face some of the greatest challenges in respect of food and income security. One third of the 300 million people in sub-Saharan Africa who live in extreme poverty reside in WCA. Whereas agriculture accounts for 70% employment of the population and more than 40% of the region's Gross Domestic Product (GDP), it is given very little research (>0.86% of agricultural GDP is dedicated to research) attention by the governments of sub-region. In spite of its importance agricultural production has remained at subsistence levels, and productivity has remained largely ignored by policy makers.

Several factors such as poor policy framework, low market drive, poor soils, erratic and insufficient rainfall, inadequate infrastructure for irrigation and mechanisation, insecure land tenure, low output prices and inadequate agricultural research leading to poor management practices have conspired to keep agricultural production low. Whereas population is growing at an annual rate of 3.4%, food production is growing at 2.6%, a situation that needs to be reversed. The African vision is to have production growing at annual rate of 6% through to 2020 if the swelling population must be fed by food produced in Africa, rather than dependent on food aid. The rapidly expanding population has continued to put pressure on non-renewable natural resources; deforestation for new farmlands, and for forest products, over-exploitation of farmlands, loss of genetic materials, over-exploitation of marine life, etc. There also health issues such as HIV/AIDS, malaria and tuberculosis. Inadequate nutrition exacerbates the effects of these diseases.

In the future increases in agricultural production must come from increases in the **productivity** of existing **farmland**, and of **labour**. There is a need to arrest the clearing forests for new farmlands. Such new productivity increases would require crop and animal

- varieties with higher genetic yield potential,
- varieties with greater tolerance to such stresses as soil acidity, drought, insects and diseases, and
- sustainable soil fertility techniques.

Thus sustainable natural resources management is, therefore, the most critical factor in agricultural food production in West and Central Africa. **Soil, water, genetic resources** and **human communities** are thus the central issues. The challenge becomes greater if one takes into account the current fragile nature of the ecosystems characteristic of much of West and Central Africa. The hope is that science and its application to boost agricultural factors of production will come to our aid and enable us to meet this challenge of sustainable intensification of our agriculture.

## **Soil degradation**

Food production relates most directly to productivity of soils. Declining productivity of African soils have been translating directly to declining food production. Farm productions are frequently characterised by removal of crop material or residue from fields, e.g. for livestock feeds, construction of homes or barns, or even burning of such materials. Farms rely on nutrient mining, which lead to loss of organic material, nutrient depletion, soil compaction, and loss of texture. Such soils store less water, thus creating a situation for drought. This is even made worse by declining amounts of rainfall. Research needs to provide alternative solutions to these. For example there is need to focus on:

- Integrated management of soil fertility
  - Determination of soil degradation indicators
  - Reduction of tillage to minimise erosion and organic matter decomposition, and reduction of labour
  - Replenishment of organic matter
  - Soil cover maintenance
  - Weeds, pests and diseases
  - Evaluation of performance of technologies geared towards regeneration of degraded soils
- Several technologies exist already, but a mechanism for exploitation of these results needs to be worked-out.

### **Water availability, and its management**

Most of food production in West and Central African sub-region is dependent on rain-fed agriculture. Over the past four decades, rainfall has been very erratic in season and in quantity. There is therefore every need to find scientific solutions to the conservation and management of water resources aimed at reducing the frequency of risks from climatic changes via improved use of rain water. There is need also to examine efficient water use in farmlands, and sustainable management of inland valleys. Thus there is need to focus on the following:

- Water conservation and use efficiency; identification and adaptation of existing techniques for rain water conservation and utilisation; sustainable use of underground water.
- Innovative techniques in inland valleys management
- Agro-climatic management techniques for risk reduction in production systems
- Studies and identification of new drought adaptation strategies; association of short and long cycle varieties as a strategy to reduce risks related to irregular rainfall.
- Availability, characterisation, mobilisation and sharing of the irrigation water resources

### **Genetic resources management, and production systems**

The continued erosion of the genetic resource base of our indigenous species is as a result of lack of awareness of the significance of plant genetic resource by the decision takers, poor development of national genetic resource programs, lack or inappropriate conservation facilities, climate change and human activity. Research should therefore focus on:

- Collection, characterisation, conservation and sustainable use of crop and animal genetic resources.
- Use of biotechnology and conventional breeding techniques for the creation of new varieties.
- Management of forest resources, and agro-forestry systems
- Socio-economic and policy constraint studies on forestry management (including customary rights in land management, and policy implications)
- Intensification of production systems; this includes strengthening production capacities, and access to natural resources, production techniques

### **Integrated Natural Resources Management**

Future research should focus on a holistic approach to these issues. It must involve all sections of the stakeholders, and examine competitiveness of the sub-regional agriculture. It

should focus on reduction of poverty, food and income security. It should address capacity development and retention; production; markets; and policy issues.

### **1. Production**

The key productivity constraints and opportunities may be re-grouped into:

- lack of improved germplasm
- low efficiency of input use
- low labour productivity
- little market orientation
- weak productivity of the farming system
- poor integration of the production systems
- land tenure constraints
- weak access to credits

### **2. Markets**

Focus on markets should be on national, regional or international level markets.

The key elements may be divided into two kinds markets; **input markets**, and **output markets**. The constraints and opportunities include

- poor access to markets; including infrastructural issues, limited competition
- quality of products, harvest, produce processing, conservation, conditioning
- poor market information,
- poorly organised producer organisations

### **3. Policy**

- facilitating/guaranteeing access to inputs; subsidies; decentralisation and liberalisation
- strengthening research, and extension; partnerships with farmers-extension agents
- system on market control/information – training on international markets; policy that promotes regional and international markets
- promotion and institutionally strengthening professional producer organisations/ stakeholder involvement
- access to credits
- land tenure securities,
- quality control issues
- promotion of agro-industries

### **4. Capacity development**

Capacity building should cut across all the theme, and should be emphasised much more as institutional capacity building; research, extension, producers, policy, and private sector.

### **Expected Outcomes/impacts to be achieved**

#### **Outcomes: NRM**

- Increased adoption of soil & water mgt strategies
- Increase pest & disease mgt integration with soil fertility mgt
- Improved mgt of agrobiodiversity at community levels
- Enhanced utilisation of genetic diversity and their conservation

#### **Outcomes: production**

- Increased productivity and production of selected major crops/livestock of food security significance
- Increased production of high value crops in urban and peri-urban areas
- Improved productivity and production a number of neglected and under-utilised species of food security significance

**Outcomes: markets**

- Improved access to markets: national regional and international
- Improved market information systems at community and national levels
- Better organisation of producer groups
- Enhance value addition to agricultural produce
- Niche markets identified for neglected and under-utilised species

**Outcomes: policy**

- Policy in place to support improved access to inputs and credits
- Policy on to strengthen extension and it link with farmers and research
- Appropriate policy on market control and facilitation
- Strengthened policy on international trade