

THE SIGNIFICANT ROLE OF TECHNOLOGICAL INNOVATION IN THE
SUSTAINABLE DEVELOPMENT OF AGRICULTURE AND FOOD
SECURITY IN AFRICA.

A presentation by Honourable
Kwabena Appiah – Pinkrah, Member of Parliament and
Co-Chairman, Ghana Parliamentarians Against Hunger and
Malnutrition Caucus

DELIVERED AT GLOBAL ECONOMIC LEADERS SUMMIT 2011 (GELS)
4TH – 6TH SEPTEMBER 2011
CHANGCHUN – JILIN PROVINCE, PEOPLE'S REPUBLIC OF CHINA

Introduction

Over the last several decades, enough food has been produced globally to feed everyone in the world. Nonetheless, undernourished people in the world continue to rise from 923 million in 2007 to over 1 billion in 2010.



According to the FAO;

The food situation is critical in 33 countries that suffer chronic shortfalls in aggregate food production, lack of access to food or localized food insecurity.

The overwhelming majority of the world's undernourished people live in developing countries:

- With some 65 per cent concentrated in just seven countries; India, China, the Democratic Republic of Congo, Bangladesh, Indonesia, Pakistan, Ethiopia and the Horn of Africa.



- The highest proportion of undernourished people goes chronically hungry. The causes, according to the FAO, range from low agricultural productivity, the current economic crisis and adverse weather to the HIV/AIDS pandemic, civic strife and war.

The fact that a billion people in the world are undernourished while some regions are producing enough questions the effectiveness of the distribution of global food production and the technological innovation used in food production globally.



The situation in Africa is particularly worrying. Farmers in Africa have lost 25 per cent of their purchasing power in the last 25 years and farmers income levels are now \$200 per person per year (Source: UNCTAD 2010 Report).

However, some semblance of hope for the future of African Agriculture is emerging, as evidenced by a number of recent studies:



- In Southern Uganda for example, farmers have turned to growing apples, displacing import and earning as much as \$0.35 per apple at the farm and even higher price in the capital Kampala.
- In Zambia, research shows that cotton production has increased ten folds over the last ten years bringing new income to 120,000 farmers.

•In Kenya, floral export now threaten to surpass coffee as the country's leading cash earner, while tens of thousands of Kenya's small holders farmers grow and export French beans and other vegetables.



•In Ethiopia, the local coffee Cooperatives have been able to respond to international marketing demands while being able to create a brand image that traces the product back to its origin

•Over all export of vegetables, fruit and other flowers from eastern and southern Africa now exceeds \$2 billion a year, up from virtually zero a quarter – century ago (Source: UNCTAD 2010 Report).



•In Ghana, my country, cocoa production has exceeded 750,000 metric tones not far from the target of 1 million metric tones by the end of 2012.

- Similarly, farmers in the north of Ghana have found an opened sorghum market and with support of the Venture Capital Trust Fund, over \$35 million credit facility has increased sorghum production since 2007



However, the volumes involved in these cases are far from adequate, especially for African countries struggling to meet their millennium goals particularly MDG 1 and 7 (aiming to end poverty and hunger and achieve environmental sustainability).

While demand for food continues to rise in conjunction with demand for goods and services in Africa, the amount of land available for food cultivation is decreasing due to soil degradation and competition for other uses. (Source: UNTAD 2010 Report).



It is anticipated that over the next 25 years the key driver behind evolution in African food markets will be urbanization. Achieving food security in the face of these trends will require breakthrough technologies some of which are yet to develop.

THE ROLE OF TECHNOLOGICAL INNOVATION IN AFRICA'S FOOD SECURITY

Agricultural technological innovation system can be fundamentally characterized as:

- The set of actors and the collaborative linkages that is critical for the development of agriculture.
- Involves products, processes or services that are new to the local context.

- Take the form of manufacturing and design of agricultural machinery that are introduced to start or improve farm mechanization in a country.
- Come in the form of transfer of such technology from outside to improve the local content.

- Take the form of research, science and extension services resulting in the improvement of the farmers' productivity.



Technological innovation, which is the bane of Sub-Sahara Africa's Agriculture development downward trend is being given a new facelift recently in a few countries.

Improved variety of seeds, new methods of planting and application of insecticides and pesticides;

As well as the introduction of new farming equipments manufactured locally;



Or imported to support the small scale farmers in some African countries in the past decade have indeed contributed to a large extent to the recent transformation of Agriculture in Sub-Sahara Africa.

In my opinion, the twenty-first century present once more opportunity for Sub-Sahara Africa to rejuvenate its agriculture sector on premise of innovation capacity building and technological transfer.



Knowledge, as opposed to information, is the basis of technological learning and requires the development of cognitive learning skills, linkages and institutional support structures that promote:

access, use, dissemination and applications based-science, technology and innovation.

Sub-Sahara Africa must adopt this approach in order to resuscitate its weak agriculture systems in the twenty first century.



SOME PROGRESS MADE

Already there are signs of this nature in countries such as:

- The Republic of South Africa and recently Zimbabwe and Namibia where agricultural equipments such as tractors were assembled locally or imported to support small scale farmers.

- In my country Ghana, the **Village Infrastructure Project (VIP)** has become the lifeline support for farmers in their small farming mechanization in maize growing communities.



CRITICAL INGREDIENTS IN SUPPORT OF ENHANCED PRODUCTIVE CAPACITIES FOR AGRICULTURE IN AFRICA

Although technologies form an integral part of improving the efficiency of food production, **a range of factors beyond technology** affects the development of productive capabilities for agriculture in Africa and these include:

- The presence of science infrastructure;
- stronger linkages between various actors both for sharing information and knowledge;
- improved physical infrastructure that helps secure easier access to market, land security;



- Protection of farmers' rights are other factors that will determine the ability of African agriculture to access relevant technologies.

FACTORS THAT IMPEDE THE GROWTH OF TECHNOLOGICAL INNOVATION IN AGRICULTURAL SYSTEMS IN SUB-SAHARA AFRICA



The following are some of the impediments of Agricultural technological innovation in Africa:

- **Low investment drive:**
The steep decline of investment in agricultural research, technology and infrastructure that has occurred all over the last few decades in the sub-Sahara Africa has affected food security in two distinct ways:



- First it has resulted in production falling short of growing demand, with smaller stocks surpluses available;
- Secondly, it has contributed to high production and distribution cost that in turn have kept food prices high and draining investments in science, technology and innovation for improved agriculture.

○ In sub-Saharan Africa, the research intensity in agriculture defined as the percentage of the total GDP is only 0.53 per cent (UNCTAD 2010 Report).



○ The financial crisis has also impacted government social services, trade, investment, aid, remittances and exchange rates, making imports more expensive and affecting the importation of agricultural equipments

These have had adverse impacts on science , technology and innovation capacity as government turn their attention to other short-term goals instead of investing in long term goals including technological innovations.



➤ **Land tenure and credit access:**

One of the main barriers hindering small holders' access to agriculture credit in developing countries is the inability to convert property into usable assets, due to the lack of legally recognized land tenure rights.

This limits intense mobilization of funds by small scale farmers to pay for the cost of the adoption of new technology and innovations.



➤ **The capacity of the small scale farmer to adopt technology:**

To enable a number of fundamental production related conditions for smallholder farmers to manage risks and uncertainty and become effective players in the market, it is necessary to improve:

- **ACCESS TO AGRO-INPUTS;**
- **ADEQUATE STORAGE CAPACITY;**
- **ACCESS TO EXTENSION SERVICES ETC.**



These are all embedded in a strong presence of innovation and technology that enhance the productivity of the smallholder farmer and for which they are not capable of adopting.

➤ **Weaknesses in the structural policy reforms:**

In the 1980s when the debate on food security in Africa was marked by major trends like the Structural Adjustment Policies (SAPs), Governments in Africa focused on reforms such as:

- The elimination of price control, privatization of state farms and state owned enterprises;
- Abate taxes on agriculture exports, subsidies on fertilizer;



These proved to be ineffective because technological innovations were not encouraged alongside these reforms;

Inaccessibility to credit and fluctuation of prices discouraged private investments for technology and research to transform agriculture and **SAPs** failed to address this.

**DEVELOPING AND
DISSEMINATING RELEVANT
TECHNOLOGICAL INNOVATION
FOR AFRICA'S AGRICULTURE
REVOLUTION**



THE WAY FORWARD

- Manufacturing of farm equipments from outside the continent or by Africa's own Engineers:
- Research and extension services;

- Transfer of technology

The above form the key embodiment of technological innovation that should play a very key role in Africa's agricultural development.



The second important source of technological innovation which is the manufacturing of equipment relates to:

- the increased specialization in the trading of finished agricultural machinery between the developed countries and the Sub-Sahara Africa with China becoming Africa's lead trading partner in this endeavour:



- Firms and farms that are beneficiaries of this network in Sub-Sahara Africa benefit from the linkages with sellers and other competitors in the market wherein;

Not only the machinery and equipments are transferred to Africa but also marketing skills, management standards and quality protocol and production systems are shared with local expertise. This is good but contributes to the dependency syndrome of Africa on the developed world for its agricultural technology;



South-South cooperation is one another important avenue that offers the catalyst for addressing the issues of Africa's productivity enhanced technologies at bilateral, regional and inter-regional levels;

Such cooperation can include exchange of best practices and technicians for agriculture production;

It can be taken through regional or sub-regional organizations of African countries through dedicated agriculture and food sector development programmes and trade programmes;



The existence of science and technology institutions in Africa however offers the best solution for Africa's home grown technological innovation advancement for a sustainable agricultural development;

African countries must therefore strengthen and resource training institutions and provide incentives to researchers who work in agriculture related institutions.



There must be increased funding for extension services, research into improved seedlings;

And incentives provided for agro-chemical processing and agricultural equipments manufacturing enterprises including the provision of tax rebates and other Governments' support services to attract and retain these companies.



I must admit that viewing agriculture through an innovation lens is also becoming more prevalent in policy circles in recent times in Sub-Saharan Africa and this include the following examples;

The Framework of African Agriculture Productivity (FAAP), developed by the Forum for Agricultural Research in Africa (FARA) and its partners, advocates putting farmers at the centre of agriculture productivity.



The Comprehensive African Agriculture Development Programme (CAADP) also places a lot of emphasis on technological innovation as a policy issue for Africa.

CONCLUSION

It is my firm belief that developing strong capabilities in science, technology and innovation are key elements that are needed by agricultural firms and farms just as it applies for manufacturing firms;



The need for improved innovation capabilities will likely rise further in the light of variations in climatic conditions as well as continued intense competition;

It is time for Sub-Sahara Africa to take up the challenge to make technological innovation the masterpiece of its policies and programs;



This will promote synergy between food security goals, environment sustainability and social equity.

**THANK YOU FOR YOUR
ATTENTION.**