TRUSTAFRICA

IDRC | CRDI

Canada

ICBE POLICY BRIEF

# Strategic Options for Small-scale Maize Seed System Development in West and Central Africa


By

**D.O Awotide,**
Department of Agricultural Economics and Farm Management,
Olabisi Onabanjo University, Yewa Campus,
Ayetoro, Ogun State, Nigeria.

**H.M Tontsa**
Institut de Recherche Agricole pour le Developpement (IRAD),
Yaoundé, Cameroon


## EXECUTIVE SUMMARY


Seed can play a critical role in increasing agricultural productivity. It is an essential, strategic and an inexpensive input that often determines crop yields and the productivity of all other agricultural inputs.

Taking into consideration the importance of seed in agriculture, a key question is how to facilitate the development of a seed system. Such a system should be able to produce and distribute new seed varieties that meet the needs of all farmers cost effectively.

The study identified the constraints in maize seed production. It also identified the criteria used by farmers to select seed for production.

As part of its recommendations, the study has developed strategies that would integrate informal and formal maize seed production.

Evidence from the study has shown that maize seed industry in West and Central Africa (WCA – Nigeria and Cameroon in particular) still remained largely underdeveloped. Maize seed production is however profitable. There still exist problems associated with non-availability of foundation seeds, unavailability of land for potential maize seed growers (especially in Cameroon) and unavailability of required manpower in the production process.

Among the criteria used in choosing the maize seed variety for planting among farmers are market value, grain quality, maturity period and resistance to pests and diseases.

A key finding of the study is that a seed system that links seed companies with individual seed producers seems to be the best option. Such a system works where the seed company contracts seed producers as out-growers or contract growers.. Government agencies can assist the informal sector by providing foundation seed, extension advice on seed production, processing, treatment and storage and legal framework that permits seed marketing.

Such a system would facilitate the growth of small-scale entrepreneurs in the informal sector. This would especially be much suited in Cameroon where there are no small-scale formal seed producers. The evidence provided in this study could lead to the sustainability of maize seed production in WCA where seed companies exist but are struggling to survive. It could also facilitate the establishment of private seed enterprises in Cameroon where none exist.



HEADQUARTERS

TrustAfrica
Lot 87, Sacré Coeur 3
Pyrotechnie x VDN
BP 45435
Dakar–Fann, Senegal

T +221 33 869 46 86
F +221 33 824 15 67
E info@trustafrica.org
W www.trustafrica.org

The ICBE Research Fund is a joint initiative of TrustAfrica and the International Development Research Centre.

FEBRUARY, 2013 - #1

## INTRODUCTION

Seed can play a critical role in increasing agricultural productivity. It is an essential, strategic, and relatively inexpensive input that often determines the upper limit of crop yields and the productivity of all other agricultural inputs (Maredia and Howard, 1994; Langyintuo, 2005).

Taking into consideration the importance of seed in agriculture, a key question is how to facilitate the development of a seed system that can generate, produce and distribute new seed varieties that meet the needs of all farmers, in a cost-effective way (Maredia and Howard, 1994). Access to high quality seed small-scale farmers has been constrained by many factors, including an underdeveloped seed industry (Gemeda, et al., (2001).

Theoretically, a seed industry essentially comprises four essential components:
a) plant breeding and research,
b) seed production and multiplication,
c) processing and storage, and
d) marketing and distribution.

The industry's performance depends on the efficiency of each component. These components possess different economic and technical characteristics that determine the roles that public and private organisations play within the industry (Gemeda, et al., (2001). The poor performance of the seed industry in the WCA region necessitated the development of an ideal seed system.

An ideal system ought to ensure adequate supply of quality modern seeds varieties at affordable prices and at the right time. It also needs supportive institutional and policy conditions for active participation of all key entities.

Seed system development can be viewed as a dynamic process of matching the supply to the changing demand for seeds. The seed system passes through several phases as it evolves from a traditional to an advanced system. Maize industry in Africa is undergoing rapid changes (Nambiro et al, 2002) and its development seems to follow the same path (Morris et al 1998). The nature and pace of these changes have varied among countries, reflecting differences in stages of development and the structure of production from one country to the next, as well as differences in the economic, political and institutional climates (Nambiro et al, 2002).

The study identified the constraints of maize seed production, identified the criteria used by maize seed farmers to select seed for production and developed strategies for options for the integration of informal and formal maize seed producers to promote farmer incentives for maize seed production.

## RESEARCH METHODOLOGY

The study was conducted in Nigeria and Cameroon in West and Central Africa respectively. A multi-stage sampling technique was used to select 167 maize seed farmers from two divisions in Cameroon and one state in Nigeria. Questionnaires were administered in both countries by local enumerators selected from the agricultural development sector. Information was also obtained from private seed companies (where applicable) and relevant stakeholders in maize seed industry.

**Seed system development can be viewed as a dynamic process of matching the supply to the changing demand for seeds. The seed system passes through several phases as it evolves from a traditional to an advanced system.**

Descriptive and quantitative techniques were employed in the analysis of the study data. Descriptive analytical tools such as frequency tables were used to describe the socio economic characteristics of respondents and options in maize seed production. Finally, important indices were used to rank seed production constraints.

## 3. RESEARCH FINDINGS AND DISCUSSION

### a) The status of maize seed industry in Nigeria and Cameroon

Evidence from the study has shown that the maize seed industry in WCA (Nigeria and Cameroon in particular) has not developed remarkably. The study revealed that there was no formal maize seed production system in Cameroon. Maize seed in Cameroon came from either the government agencies or from the farmers.

In Nigeria, however, there was a formal maize seed production system. The country's National Seed Programme recognised three tiers of participants in the industry:

1- large scale seed companies,
2- small/medium seed enterprises, and
3- community seed system (informal sector).

Currently, there are few seed producing companies in Nigeria. The industry is gradually transforming from a marketing enterprise to a seed producing and marketing one.

### b) Major challenges facing maize seed producers

Major constraints stand in the way of industry transformation. According to the seed companies, the serious lack of adequate manpower is one of the major challenges. Seed companies estimated that just about ten percent of the required trained personnel are available in the country.

Other major challenges cited by the companies are unavailability of foundation seed and limited land for use in seed production. In this study, unavailable or limited land refers to inability of willing seed producers to access farm land for maize seed production. On the other hand, lack of access to credit facilities is not a major constraint to seed production as it ranked last in order of importance.

In the final analysis, the three most important constraints to maize seed production based on a sample of maize seed farmers in WCA were unavailability of foundation seed, unavailability of land, and unavailability of labour.

### c) Criteria used by farmers to select maize seeds

Farmers use many but similar criteria in selecting the maize varieties they grow. The most important criteria across the countries were (in order of importance)

1- market value,
2- grain quality,
3- maturity period and
4- resistance to disease.

However, the criteria varied across the countries. Cooking quality, adaptability to poor soils, fertilizer requirement, and taste were the second group of criteria. Odendo, et al., (2002) noted that resistance to insects and other pests as a criterion for selection of maize varieties is very useful in practice if the attribute is combined with the most important criteria farmers apply in variety selection, thus adding value to the varieties.

### d) Potential of maize seed production in West Central Africa region

Analysis of the options and prospects of integration revealed that Nigeria seemingly possesses great potential for the seed business. This is mostly due to its land area, population and the status of the country in the West African Sub-regional trade. A flexible maize seed system is therefore crucial and for a sustainable maize seed production system, the formal seed production sector in most countries should encourage the informal sector, which can meet the seed needs of a wide spectrum of farmers.

The formal sector could produce hybrids and other high value seed along with the informal sector. In most countries in the WCA region, informal farmer-to-farmer spread of seeds is the single most frequently used source of seed by farmers. It is thus necessary for governments to recognise the informal sector as an important low-cost source of quality seed. Government agencies can use this as a vehicle for providing resource-poor farmers with improved seed of modern varieties at affordable prices.

For a sustainable maize production, there is need to provide farmers with access to good seed within easy distance, in time and at affordable prices. One workable option is to develop a seed industry with both the formal and informal seed systems providing quality seed to the consumers. This will increase the awareness of seed consumers of seed quality and

price, and lead to an overall increase in seed use and consequently to agricultural production.

Based on the study, the following options were identified:

1- There should be research institutions providing foundation seed and other inputs to selected farmers through extension services. After harvest, farmers sell certified seed and reimburse the inputs costs to extension services.
2- Potential contract growers are identified by national extension services. The farmers are provided with foundation seed to produce certified seed. In this case, technical advice is given to seed producers by researchers and extension agents.
3- Foundation seeds are given to farmers by researchers. Farmers purchase and apply fertiliser and other inputs. Scientists provide technical assistance to farmers.
4- Non-governmental organizations (NGOs) organise and supply farmers with foundation seed and other inputs for production of certified seed. After seed sales, half of the initial funds are deducted and provided to extension services to encourage seed production by other farmers.
5- Foundation seeds are provided by private seed companies to identified out-growers to produce maize seed. Private seed companies provide incentives such as fertilizer and other inputs to facilitate the production process. After harvest, maize seeds are processed by seed companies and sold as certified seed. The options guarantee maize seed produced by the informal sector.

Emanating from the study, a seed system that would integrate large-scale and small-scale seed companies with the individual seed productions, as presented in option five, will provide the best option. The integration could be achieved if the seed producers serve as out growers or contract growers for the seed companies. The seed companies may also provide technical and financial incentives to the out growers to accelerate and sustain the seed system. In addition, accelerated seed certification and seed quality control will be ensured and there will be sure market for the seed produced by the informal sector. Presently in Nigeria, this option is being adopted by some seed companies in order to meet the needs of their numerous clients, though the integration is not as complimentary and interactive as it should be. This option seems practicable as a number of analyses have shown that there is a wide diversity in how the two sectors interact (Lanteri and Quagliotti, 1997; Maredia and Howard, 1994).

## CONCLUSION AND RECOMMENDATIONS

The survey conducted in the two countries revealed that there is no formal maize seed production system in Cameroon. Maize seed in Cameroon came from either the government agencies or from the farmers. However, in Nigeria, there is a formal maize seed production system. A seed system that would integrate large-scale and small-scale seed companies with the individual seed productions will provide the best option. The integration could be achieved if the seed producers serve as out growers or contract growers for the seed companies. The seed companies may also provide technical and financial incentives to the out growers to accelerate and sustain the seed system.

In addition, accelerated seed certification and seed quality control will be ensured.

## POLICY RECOMMENDATIONS

Based on the findings, the following policy recommendations are proposed :

**a)** Government agencies could encourage the growth of informal maize seed producers by providing them with access to foundation seeds bred by research institutes like Nigeria's National Agricultural Research System. Farmers should also have access to extension advice on seed production, processing, treatment and storage.

**b)** There is need for all the stakeholders in the seed industry to support a legal framework that permits the marketing of uncertified seeds which conform to the prescribed standards on the genetic purity, germination and the moisture content laid down for the seed variety.

**c)** Appropriate mechanisms should be put in place to strengthen public and private extension programmes to increase farmer knowledge about the benefits of using new seed. Such programmes should also transmit information about farmer preferences to researchers which will also help increase the demand for new seed.

**d)** Government should make efforts aimed at improving transport and information infrastructure, and the revision or enforcement of laws and regulations to lower the risks and transactions cost of doing business in the seed sector. These are keys to reducing the cost of producing and distributing seed.

**e)** Concerted efforts should be made to remove compulsory seed certification and restrictive trade licensing requirements. This permits the production of quality seed by smallholders and sale among neighbouring farmers. In addition, seed companies would be able to involve smallholders in contract seed production more easily.

**f)** Public research and extension agencies also need to consider how to use subsidies to strengthen ties to subsistence farmers who may be unable to purchase seed through the market but could benefit significantly from access to improved varieties.

## REFERENCES

Gemeda, A., G. Aboma, H. Verkuijl, and W. Mwangi. 2001. *Farmers' Maize Seed Systems in Western Oromia, Ethiopia*. Mexico, D.F.: International Maize and Wheat Improvement Center (CIMMYT) and Ethiopian Agricultural Research Organization (EARO). p 42.

Langyinto, A. 2005. *An analysis of the maize seed sector in southern Africa.* A paper presented at a Rockefeller Foundation workshop on Biotechnology, breeding and seed systems for African crops. Nairobi, Kenya 24-27 January, 2005. p 25.

Lanteri, S. and Quagliotti, L. 1997. *Problems related to seed production in the African region.* Euphytica. 96:173-183.

Maredia, M., and J. Howard, 1994. *Facilitating seed sector transformation in Africa: Key findings from the literature.* Global Bureau, Office of Agriculture and Food Security. USAID. Policy Systhesis, Number 33. pp 1-6.

Morris M. L., J. Rusike and M. Smale. 1998. *Maize Seed Industries: A Conceptual Framework.* In Morris M. L. (ed.) Maize seed Industries in Developing Countries. Boulder, Colorado: Lynne Rienner Publishers. pp. 35- 54.

Nambiro, E, H. De Groote and W. O. K'osura 2002. *Market structure and conduct of the hybrid maize seed industry, a case study of the Trans Nzoia district in western Kenya.* In Friesen D.K. and A. F. E. Palmer (eds.). Integrated Approaches to Higher Maize Productivity in the New Millenium. Proceedings of the 7th Eastern and Southern Africa Regional Maize Conference, Nairobi, Kenya, 11 - 15 February 2002. Mexico, D. F.: CIMMYT, pp. 474-479.

Odendo M., H. De Groote, O. Odongo and P. Oucho. 2002. *Participatory Rural Appraisal of Farmers' Maize Selection Criteria and Perceived Production Constraints in the Moist Mid-altitude Zone of Kenya.* IRMA Socio-Economic Working Paper No. 02-01. Nairobi, Kenya: CIMMYT and KARI.