

Growing an Effective Seed Management System: A Case Study of Nigeria

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Abstract

Use of improved seed materials has been a major contributor to increased agricultural production and food security in Nigeria and world over. Improved quality seed is not only the cheapest and basic potential of increasing yield but also fundamental in raising the efficiency of other inputs like fertilizers, agro-chemicals and agro-machinery. Greater percentage of improvement in agricultural production has come from the use of improved seed. In essence, no agricultural practices, i.e. fertilization, irrigation etc can improve crop production beyond the limit set by seed. Seed is a means of technology transfer to farmers, who have certain expectations from new crop varieties as promised by the breeders. In ensuring this, seeds of new varieties must be made available to the farmers in adequate quantity and quality and at affordable prices. The Nigerian seed industry however has not fully developed the capacity to perform this role very well: the current national seed uptake is less than 10%, while the regulatory and enforcement capacity in the industry has been weak. The Nigerian agricultural seed sector has evolved over the last 30 years in terms of seed science and commercial seed production capabilities. However, the sector is still under-performing in terms of meeting the agricultural seed needs of the country. The development and performance of the seed sector is constrained by many factors which include weak technical capacity, poor market mechanisms, inefficient enforcement of seed law, information asymmetry, insufficient capital investment and low utilization of innovations. This study was designed to identify some of the weak links in seed development programme(s) of Nigeria, as well as the recent successful efforts geared towards encouraging private initiatives in a bid to outline basic and technical steps required to grow and maintain an effective seed system in the country or anywhere in the world.

Keywords: Seeds, Seed Management Systems, Seed Industry

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Introduction

Nigeria is located between longitude 3° and 15°E of the Greenwich Meridian and latitude 4° and 14°N of the Equator. The vegetation ranges from mangrove swamp along the coastal region through the rain forest belt to the Savanna in the middle belt and the Sahel Savanna in the far north. These vegetation belts in addition to good weather conditions support the production of tree crops, root and tubers, cereals, legumes, oil, and fibre crops etc. The total land mass of Nigeria is 923 768.64 km². The total cultivatable area is 91 million ha out of which about 50% or 45.5 million ha are under permanent and arable crops (Okolo, 2003). Nigeria has a population of about 120 million people of which 70% are in the rural areas. The rural dwellers are predominantly peasant farmers with small holdings. The country's population growth rate is estimated at 2.8% (Central Bank of Nigeria, 1996). Nigeria Gross Domestic Product (GDP) is 116 000 as at 1999 with 32% coming from crop production. Before Nigeria's independence and in the early 1960s, agriculture was the mainstay of the economy and accounted for over 50% of the Total Gross Domestic Product (CBN, 1991). Modern farm technologies which are known to be technically and economically more efficient than the traditional system (Goldsworth, 1965; Falusi, 1973; Akinola, 1979; Ejiga 1990) were however seldom employed at this period. In order to feed the teeming population, provide raw materials for agro-based industries, and possibly export surplus produce to earn foreign exchange, developing countries like Nigeria cannot afford to toy with their vast agricultural potentials. In Nigeria, the yields per unit area by the farmers are low compared to the potentials for the various crops. Reasons for the low yields are: poor agronomic practices, poor crop types (varieties), pests and diseases, low soil fertility etc. Increasing yield per unit area can only be achieved through use of improved seed coupled with good agronomic practices (Okolo, 2003).

The most important prerequisite for good crop production is the availability of good quality seeds of high-yielding varieties (Oyekale *et al.*, 2014). The quality of seeds alone is known to account for an increase in productivity of at least 10–15%. To achieve this high quality, all the factors in production that will affect viability and genetic purity should be taken into account. The production techniques should be mastered and the environmental conditions known. Until farmers are provided with quality seed, particularly the improved varieties, it would be uneconomic for many countries of the world to spend precious foreign exchange on fertilizer or other agric. inputs. Investments in plant breeding varietal development would also be a waste if the improved seed are not passed on to farmers in form of quality seeds.

It is important that improved and high quality seeds are disseminated to farmers at the right time and in the right quantity and quality; because farming activities depend on a continuous supply of good quality seeds and planting materials.

Seed systems have close linkages with other systems, particularly research and extension. Without an effective extension system, quick response to farmers' needs, it would be difficult to develop a seed system, particularly in the informal category (Oyekale and Adebisi, 2005). Research on the other hand, has responsibilities for the development of both formal and informal seed systems. This study was therefore designed to identify some of the weak links in seed development and management systems in Nigeria, as well as the recent successful efforts geared towards encouraging private initiatives in an attempt to outline important elements required to grow and maintain an effective seed system in the country or anywhere in the world.

National Seed Multiplication System

Realising the importance of seed in agricultural production, a national seed programme tagged "National Seed Service" was set up in 1976 as a project of the Federal Department of Agriculture. This project has undergone several developmental stages and enjoyed a number of international assistance/loan to place it in the present status as the main public sector agency responsible for coordination of seed and related activities in the country (Okolo, 2003).

Policy Support for the National Seed Programme

The current seed policy was derived from the broad guidelines provided for seed supply under the National Agricultural Policy for Nigeria in 1987. Following these guidelines, a national workshop on the seed subsector was held in Kaduna in 1992 to evolve a National Seed Subsector Development Plan for Nigeria. In order to give it the desired legal backing, a National Agricultural Seed Decree No. 72 of 1992 was thereafter promulgated. The decree established a "National Seed Council" charged with the responsibility for overall policy guidelines and monitoring of the development of the national seed system. The decree also established the National Seed Service Unit, Seeds Standard Committee, Crop Variety Registration and Release Committee, Seed Industry and Skill Development Committee etc.

As component bodies to the National Seed Council of which the Honourable Minister of Agriculture and Rural Development was the Chairman. This decree covers all agricultural seeds which were defined by the decree to include: cereals, legumes, oil, grass, forage, fibre, root, tuber, or any other kind of crop seed or seedling commonly recognized within Nigeria as agricultural seed; lawn seed, vegetable seed, forestry seed and seedling, horticultural seeds and seedlings, ornamental seeds, seed mixtures and all other planting materials that may be designated from time to time. In order to accommodate emerging new trends in technological breakthrough, the "Seed Rules and Regulations" designed to periodically update implementation requirements for the series of provisions in the decree were later produced for the country.

Scope of the Seed Programme

Although public sector activities still dominate the Nigerian seed industry, it is a pleasant development that quite a number of private sector investments are beginning to emerge within the industry. Today, both public and private sector institutions/organizations are actively engaged in seed business in Nigeria. The seed sector is therefore segmented into the formal and informal units. In the formal system, activities of individuals, agencies and organizations that use seed developed by "research" with known pedigree are co-ordinated by organised bodies. Some of the organizations in this category may or may not be directly involved in seed production and marketing but their activities are related one way or the other to the overall objectives of making improved, high quality seed available to Nigerian farmers. Both public and private sector agencies fall within this system of seed multiplication. However, the informal seed system over the years has proved to be more effective because of its decentralised and non-bureaucratic operations.

Improving the Informal Seed System

Participants in the informal seed system category are farmers who rely wholly on either their saved seed or seed obtained from their neighbours. Most farmers in rural areas belong to this category as empirical data have shown that about 80% of the Nigerian farming population depend on their own saved seed or traditional varieties (Okolo, 2003). The rate of adoption of improved seeds is low, partly due to lack of interaction between the formal and informal seed systems. It is rare to find improved varieties bred at the research stations being passed on to the informal sector for multiplication and sale as an essential part of the national seed policy.

Yet it is the informal sector that holds the key to improving access to seeds and crop productivity among smallholder farmers, especially seeds of self-pollinating crops. The formal seed sector has shown little interest in seed multiplication for self-pollinating crops and crops with high seeding and low multiplication rates. The cost of production, processing, and transportation has made seeds of these crops expensive. Also farmers tend to save and use their own seeds, thus offering little demand for them and low returns to seed companies. For such crops the most economical way is to produce foundation seed or high quality certified seed and sell these to identified seed growers within the community. The quality of Informal sector seed used by farmers can be improved by training farmers in seed production strategies, link farmers to seed companies and research institutions for routine renewal of seed stock, developing new improved varieties meeting local quality and market preferences and use effective extension services. Extension plays a crucial role in training farmers in crop and seed production and is therefore a prerequisite to establishing a seed system.

Organized Private Sector Agencies

Existing private sector participants in the seed industry in Nigeria include:

- a. Premier Seed (Nigeria) Limited which is located at Chikaji Industrial Estate, Zaria. The seed company is involved in the production and distribution of open-pollinated cereals, legumes, oil-seed, and vegetables. It produces and markets hybrids for some cereals and vegetables as well.
- b. UT-Seedis adivison of UTC (Nigeria) Pic. It is located at Tend, Jos, in Plateau State and the major crop emphasis has been on suitable midaltitude maize varieties for the plateau (midaltitude) areas.
- c. Alheri Seed (Nigeria) Limited is also located at Zaria. It is involved in both hybrid seed and open-pollinated varieties of cereals, legumes, and vegetables.
- d. Savannah Seeds is located in Jos, Plateau State. Major crops handled include hybrid and open-pollinated maize.

Seed Dissemination by Seed Companies

Identified channels of seed Dissemination in Nigeria include: distributors who sell wholesale, stockists (retailers), agricultural organizations or programs and projects, and also through direct supply to farmers. Different levels of discount are provided, depending on volume. It is important to realize that seeds are alive (they contain a dormant embryo) during the dissemination process and should be handled with a lot of care. In spite of these channels, it has been established that the seeds of these companies do not get to resource-poor farmers because the dealers who stock them are limited to State capitals and some LGAs. There is, therefore, a compelling need for a complementary dissemination strategy that will get the improved seeds as close as possible to the farm. This new dissemination system is the community seed strategy for farmer-to-farmer seed diffusion.

Seed Production, Demand and Marketing in Nigeria

Prior to the establishment of the National Seed Service (NSS) in 1976 and the emergence of the Agricultural Development Projects (ADPs) in the 1970s, the production and institution of improved seeds were largely handled by the individual research institutes with such crop mandate (Federal Ministry of Agric., 1989). Consequent upon this loose and unregulated arrangement, seed production and distribution were cost – ineffective and timely provision of improved seeds to farmers was greatly hampered. With the coming on stream of the NSS, the functions of the various agencies involved in the national Seed Programme were redefined to boost production and distribution of certified seeds in the country (Fed. Min. of Agric., 1989). The responsibility for producing certified seeds has now become that of the State Seed Multiplication Units (SMUs), the ADPs, both of which sometimes employ the services of contract growers and the existing private seed companies. Similarly, community seed multiplication has been included. Increases in the output of agricultural crops depend not only on the development of higher yielding varieties of seeds, but also on the efficiency of the system available to ensure that these seeds reach the farmer on time, at the right place, and at affordable prices. An efficient seed marketing system is thus an essential component of activities to increase productivity and enhance food security.

Manpower Development in Nigerian Seed System

There is generally a dearth of manpower in the key areas of Seed Science and Technology. Most of the seed technologists available in the country today were trained abroad. In order to save scarce foreign exchange on training of seed technologists, the Federal Government of Nigeria decided to develop a seed technology training centre at the University of Agriculture, Makurdi (UAM). The centre, in collaboration with Punjab University, India, engaged in offering various academic postgraduate courses in Seed Science and Technology. Also offering post-graduate academic courses in Seed Technology is the Federal University of Agriculture, Abeokuta (FUNAAB). Other universities are encouraged to develop similar programs so as to solve the manpower shortage in the seed industry. Vocational courses for on-the-job training are regularly offered the by National Seed Service (NSS) to Seedsmen in the field. Some of the available seed technology short-term courses with NSS include: Integrated Seed Science and Technology, Seed production Practices for Seedsmen, Seed Processing and Storage, Seed Certification and Quality Control Assurance Schemes for Seedsmen, Seed Enterprises Development and Management. However, it is important that both the academic and vocational training programmes be expanded to address emerging trends in Biotechnology. Knowledge in this new discipline is scanty and a lot of people will need to be trained in various specialized areas of this new scientific breakthrough if Nigeria is successfully going to join the new global race in Biotechnology.

Effective Seed Management System

Seed management systems should cover all crops many farmers grow. This should include vegetatively propagated crops and crops with high seed rate or low multiplication rate. The varieties have to be appropriate and they must also have a number of desirable characteristics if they are to be adopted by farmers and used successfully. Seed has to be developed within a stable political and legal environment, which ensures release of new varieties of quality seed to farmers in a sustainable manner. This must however be supported by appropriate agricultural policies. Virtually all the units and sectors involved in seed development in Nigeria are engulfed in one problem or another, resulting in observed poor performance. Some of these problems are identified as:

Low production of breeder seeds: Breeder seed production involves long-term research input, requiring skill and expertise, materials, and equipment. For example the inadequate funding of the research institutes and the NSS makes it difficult for them to engage effectively in varietal development and evaluation on a more regular basis. The output of the research institutes is far below what is required to meet the growing requirement for improved seeds and seed technology. Not only are funds reportedly inadequate, they are usually disbursed late, resulting in distortions in the breeding process. Acquisition of the necessary materials and equipment has been a problem and staff working with such inputs end up demoralised after much delay.

Poor seed certification and quality control arrangements: The laboratories required for seed testing, seed certification, and quality control are not adequate, and those available are poorly equipped. The central seed laboratory at the NSS headquarters is yet to be properly equipped and put into use. Trained staff to conduct the exercise in many localities is inadequate in number. As a result there have been cases of unlabelled seeds being sold in markets and stores, and many farmers have had the misfortune of buying adulterated seeds.

Poor seed distribution arrangement: Improved seeds produced by the public sector were sold to the farmers through farmers' supply companies, agro service centres, ADPs, cooperative societies, etc. Presently, some of these centres are not working in some states, with the result that farmers in such areas now get seeds mostly from private seed companies (if any) and from seed traders/dealers in the open market. Such farmers pay exorbitant prices, and also run greater risks of buying unviable seeds due to poor storage and handling by the seed traders.

Reduced activity of NSS: The NSS has a pivotal role to play in the development of the nation's seed industry, including the production of foundation seeds, supervision, monitoring and quality control, etc. While the NSS has a cadre of experts, activities have been slowed down or hampered by inadequate and delayed funding to perform quality control functions and research support services. It was reported that many of these activities are no longer performed effectively due to inadequate funds. The NSS, for instance, has not been able to produce adequate quantities of foundation seeds from the breeder seeds received from the research institutions. Also, inadequate number of trained personnel at the field as well as insufficient resources for training and technical assistance to contract growers has constrained the development of the seed market.

Although the unit has representations at the regional and state levels, its activities especially in terms of seed quality control and seed certification have also been reduced due to inadequate trained staff and financial constraints. These results in low output, and hence inadequate supply of certified seeds to the farmers; as well as adulterated and unlabelled seeds on the market.

Lack of resources for training and information dissemination: The units charged with training manpower to handle the technical aspects of the seed industry are constrained by inadequate finance, equipment, and logistics. It was reported that staff training has been stalled; hence they lack staff to assist in seed testing, quality control, and in providing technical assistance to contract growers. Information about the seed industry, especially about the availability of improved seed varieties, is not readily disseminated to the farmers due to inadequate extension agents.

Poor seed distribution networks and rural infrastructures: Most rural areas are inaccessible due largely to the poor nature of the roads. This hindered the movement and performance of staff whose activities are required in the rural communities. Supply of improved seed varieties in such rural areas is also affected. Hence, farmers in such communities are deprived of the benefits of improved technology. One of the consequences of poor rural roads is the high cost of input delivery. The few dealers who find their ways into such rural areas often exploit the farmers through charging high prices for their stock. The NSS has put in place the Community Seed Development Program with aim to diffuse the improved seeds into rural communities. However, this scheme is not yet available nation-wide.

Conclusion

It is noteworthy that an effective seed system is germane to increased agricultural production and overall productivity of any nation. Nigeria's Seed Industry has not developed remarkably about two decades or more after the formulation of the National Seed Policy and the enabling Agricultural Seed Decree No. 72 of 1992. The various bodies involved in the implementation of Nigeria's Seed Policy have not performed creditably. Effective implementation of the seed policy by the relevant bodies had been constrained, among others, by inadequate manpower and financial resources, as well as institutional problems. The private seed industry is viable although the profitability level is comparatively low.

If these issues and others are addressed effectively at both policy and industry levels, it will provide the much needed push to realise the objectives of the seed policy. However, the unrelenting efforts of all stakeholders in seed systems development in Nigeria, including the government, point to the fact that there is hope for the industry and a fair destination is sure.

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