

Performance of Public and Non-Public Organisations in the Dissemination of Cooking Bananas in Nigeria

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Summary

The study assessed the performance of public (POs) and non-public (NPOs) organisations in the dissemination of cooking bananas in Southeast Nigeria. Cooking bananas were introduced in the area as an interim measure to reduce the incidence of black sigatoka disease on plantains. Eight POs and 4 NPOs carried out the dissemination exercise. In all, about 55,000 cooking banana suckers were distributed in about 700 villages to about 30,000 farmers. NPOs out-performed POs in the dissemination exercise; they accounted for about 90% of suckers distributed, as well as about 80% of villages and 99% of farmers reached with the crop. Without the involvement and the efforts of the NPOs, the majority of the farmers and villages would not have obtained the crop. Unfortunately, the distribution of suckers by NPOs was limited to villages within the areas where they carry out their main activities, i.e. oil exploration / exploitation. As a result, more than 80% of suckers distributed in the region were concentrated in the states of Bayelsa and Rivers. For a more even distribution of the newly developed hybrid plantains a key recommendation of the study is the involvement in the dissemination exercise of as many church and village groups as possible, especially in areas where NPOs do not operate.

Résumé

Performance des organisations gouvernementales et non gouvernementales dans la distribution des bananes à cuire au Nigeria

Cette étude a examiné la performance des organisations publiques et privées dans la distribution des bananes à cuire au Nigeria. Celles-ci avaient été introduites dans le sud-est du Nigeria comme mesure transitoire pour réduire l'incidence de la cercosporiose noire sur la banane plantain. Les résultats de l'étude montrent que 4 organisations privées et 8 publiques ont effectivement participé à la distribution des bananes à cuire dans la région. Près de 55.000 rejets de bananes à cuire ont été distribués dans environ 700 villages à environ 30.000 paysans. Les entreprises privées ont distribué près de 90% de rejets distribués dans la région, atteint près de 99% de paysans et 80% de villages. Sans l'implication des entreprises privées, la plupart des paysans et de villages n'auraient pas pu obtenir les bananes à cuire. Malheureusement, la distribution de bananes à cuire par les entreprises privées était limitée aux zones où celles-ci exercent leur principale activité, c'est-à-dire l'exploitation du pétrole. Près de 80% de rejets distribués dans la région l'ont été dans les Etats de Bayelsa et de Rivers où sont installées les principales entreprises d'exploitation de pétrole, c'est-à-dire Shell et Agip. Pour obtenir une meilleure répartition de nouveaux hybrides développés par l'IITA dans la région l'étude recommande de recourir à autant d'associations villageoises et de groupes religieux que possible, spécialement dans les régions où les entreprises privées n'opèrent pas.

Introduction

The International Institute of Tropical Agriculture (IITA) introduced cooking bananas (*Musa* spp., ABB genome) from Asia into Southeast Nigeria in the mid-1980s. They were supposed to serve as an interim measure in checking the incidence of black sigatoka disease on plantains. Black sigatoka is a leaf spot disease (caused by the fungus *Mycosphaerella fijiensis* Morelet) which has become a major threat to plantain production in sub-Saharan Africa (9, 10) reducing yield by up to 50% (9, 7), and in some instances, leading to total crop failure. The long-term strategy consisted of the establish-

ment of a plantain- breeding programme aimed at conferring black sigatoka resistance characteristics to plantains. The major cooking banana cultivars introduced were Cardaba, Bluggoe, Fougamou, Nzizi and Pelipita (5). They all have an ABB genomic constitution and except for Bluggoe they are resistant to black sigatoka disease. Cooking bananas have other important attributes which include lodging resistance, drought tolerance, early ratooning capacity, as well as high bunch yield (4, 8). They are also less seasonal in production than plantain, have less sugar, and are rich in iron and

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potassium (3, 9). The starch content is higher than in sweet bananas and this makes cooking bananas suitable for cooking (3). Above all, due to their hardness, cooking bananas have the potential of surviving in areas where plantains and sweet bananas do not (8). Less than 10 years after the introduction of cooking bananas into Southeastern Nigeria, the breeding programme of IITA has been able to develop very promising plantain hybrids, which are currently undergoing several tests before their release to farmers. Information obtained from this study would help improve the distribution of these hybrids in the region.

Methodology

The study was carried out in Southeastern Nigeria, where the crop was initially introduced. The first phase of this study consisted of visiting the tissue culture laboratories (TCL) at Onne (Rivers State) and Owerri (Imo State) where cooking banana seedlings were multiplied by means of *in-vitro* techniques and given to various institutions for distribution to farmers. The TCL's archives were consulted and staff members interviewed in order to identify the institutions that collected cooking banana plantlets for distribution. Other information collected at the tissue culture laboratories include the quantity of plantlets collected by various disseminating institutions and individuals, the date of collection as well as their destination. In the second phase, the institutions which collected plantlets at the tissue culture laboratories were visited and questionnaires used to collect the following information: the number and location of multiplication sites (nurseries), the year the distribution of cooking banana plantlets started, the quantity and method of transfer of suckers from nurseries to farmers, and the names of villages supplied with cooking banana plantlets. Other information was on methods of awareness creation and of distribution of suckers from multiplication site(s) to farmers. The survey was conducted between February and October 1998.

Results and discussion

Disseminating institutions

In all, 12 institutions spanning 10 states had collected cooking banana seedlings at the tissue culture laboratories and had carried out the distribution exercise (Table 1). They include 4 non-public organisations (NPOs) and 8 public organisations (POs).

The NPOs are Shell Petroleum Development Corporation (SPDC), Nigeria Agip Oil Company Limited (NAOC), the Anglican Diocese of Awka in Anambra State and the International Institute of Tropical Agriculture in Rivers State, while the POs are the State Ministries of Agriculture (MOAs) and Agricultural Development Programs (ADPs). The MOAs involved in the dissemination are from Cross River, Abia, and Rivers States, while the ADPs are from Akwa Ibon, Cross River, Enugu, and Imo States. The Imo's State Government House also participated in the distribution of cooking bananas in the region. In addition to the above institutions, a great number of individuals collected cooking banana plantlets directly at the tissue culture laborato-

ries. However, the present study is limited to disseminating organisations.

Table 1
Distribution (%) of cooking banana suckers by state and disseminating institution

State	Institution	% of suckers distributed (Total = 55,374)	Period
Abia	Imo Govt House*	0.4	1990
	MOA	0.2	1993-96
	SPDC East	0.2	1990-98
Akwa Ibon	ADP	0.7	1995
	SPDC East	1.6	1990-98
Anambra	Anglican Diocese	0.4	1998
Bayelsa	SPDC East	67.0	1990-98
	NAOC	0.5	1988-94
Cross River	MOA	5.2	1992-95
	ADP	1.1	1994
Delta	SPDC West	NA**	1993-98
	NAOC	2.2	1988-94
Ebonyi	Imo Govt House*	0.2	1990
	SPDC East	3.0	1990-98
	NAOC	13.0	1988-94
	MOA	0.1	1992-94
Enugu	IITA-Onne	0.5	1995-97
	ADP	0.5	1994
Imo	ADP	1.5	1990-95
	Govt House*	1.2	1990
	SPDC East	0.7	1990-98
	NAOC	0.7	1988-94
	MOA	0.1	1992-94
Rivers	SPDC East	3.0	1990-98
	NAOC	13.0	1988-94
	MOA	0.1	1992-94
	IITA-Onne	0.5	1995-97

* Government House; ** NA = data not available.

Multiplication and distribution of suckers

The majority of the institutions that carried out the dissemination of the crop started the distribution in the early-1990s, but a few commenced the distribution earlier in the late-1980s. Plantlets were produced in two tissue culture laboratories (Onne and Owerri) by *in vitro* techniques and were taken to farmers either directly or indirectly through disseminating institutions. Between 1995 and 1997, about 6,000 plantlets were produced by the Onne tissue culture laboratory of which 96% were given to disseminating institutions, while 4% went directly to farmers (Table 2).

Table 2
Production in laboratories and distribution of cooking banana seedlings

Laboratory	Quantity produced	Quantity distributed (%) to:	
		Institutions	Individuals
Onne*	6,038	96	4
Owerri**	2,350	65	35
Total	8,388	87	13

* for 1995 to 1998; ** for 1990 to 1995.

There was no record in Onne laboratory archives on sucker distribution for the period 1988 - 1994. However, several reports of the Plantain and Banana Improvement Program (PBIP) of IITA mentioned that during this period the Onne laboratory had yearly distributed an

average of 3,000 seedlings to various disseminating institutions (6). The Owerri tissue culture laboratory produced about 2,350 plantlets between 1990-1995 out of which 65% were given to various disseminating institutions, while 35% went directly to farmers. Direct distribution, i.e. from tissue culture laboratory to farmers is inefficient because through this channel only farmers who had easy access to the laboratories can collect plantlets; this is because cooking banana seedlings are fragile and cumbersome to transport manually over long distances. All the institutions that took part in the distribution exercise established nurseries for the multiplication of suckers. Multiplication sites enabled them to generate enough material for distribution. In the absence of an efficient transportation system, the establishment of nurseries across the operating area makes the distribution exercise much easier and increases the chances of reaching a much higher number of farmers. The wider the spread of nurseries across the operating area, the less need for long distance transportation of the material, as well as less trips by staff to the main nursery. SPDC established the highest number of nurseries (154), the NAOC had only one large nursery at its farm head office at Obrikom; while the Anglican Diocese of Awka had 7 nurseries in 6 parishes and the Bishop's court (Table 3).

Table 3
Number of nurseries, years of sucker distribution and percentage of villages and farmers reached with cooking banana suckers per institution

A	B	C	D	E
ADP, Akwa Ibon State	4	1	7	0.4
ADP, Cross River State	NA	1	NA	NA
ADP, Enugu State	4	1	1	0.1
ADP, Imo State	4	6	7	NA
Anglican Diocese, Anambra State Government House, Imo State	7	1	4	NA
IITA, Rivers State	NA	1	NA	0.3
MOA, Abia State	1	3	NA	NA
MOA, Cross River State	8	4	NA	NA
MOA, Rivers State	5	4	3	0.2
NAOC	8	3	3	NA
SPDC	1	7	5	3
	154	9	70	96
Average	19.6	3.4	12.5	16.7

Note: A = disseminating institution; B = number of nurseries; C = number of years of distribution; D = percentage of villages reached with the crop per institution (total number of villages = 687); E = percentage of farmers reached with the crop per institution (total number of farmers = 29,575); NA = data not available.

The institutions created awareness on cooking bananas through various media such as seminar / workshops, field demonstration days, contact farmers, farmer groups, extension staff visits, and announcements in church. However, extension staff visits were the most common means of informing farmers about cooking banana characteristics. Information given to farmers regarding the crop included its high yield advantage, its resistance to black sigatoka, and lodging resistance. Depending on the disseminating institution farmers were sometimes supplied with suckers at their farms or asked to collect these at the multiplication site; but most

often, farmers visited the institution to obtain the suckers. This is an unsatisfactory process, because, farmers who cannot easily get access to the institutions will be scarcely reached with the crop. Most institutions supplied suckers free of charge to the farmers, while a few demanded a replacement of the same number of suckers after the first harvest in order to supply other farmers. In Burkina Faso, the "West and Central African Collaborative Maize Research Network" (WECAMAN) requires farmers supplied with improved maize varieties to pay back either with seeds or money from their sales after one year (2). The number of years of delivery of suckers to farmers varied from one institution to another; it ranged from 1 to 9 years with an average of 3.4 years (Table 1). At the time of survey, some institutions had stopped the distribution, while others were still distributing. SPDC had the highest number of years of sucker distribution, followed by NAOC.

Performance of disseminating institutions

At the time of survey, all the institutions had distributed to farmers a total amount of 55,374 suckers. SPDC, NAOC, and the MOA-Cross River State were the major distributors (Table 1). SPDC distributed about 73% of the total amount of suckers distributed in the region, NAOC 16%, and MOA-Cross River State 5%. On average, SPDC distributed 4,474 suckers per year to farmers, while NAOC distributed 1,800 suckers yearly. In all, about 700 villages were reached with cooking banana plantlets, out of which the NPOs (SPDC, NAOC, and the Anglican Diocese) accounted for about 80%. SPDC had the highest number of villages (70%) reached with the crop, followed by NAOC (5%). ADP-Akwa Ibon State and ADP-Imo State had each reached 7% of the villages supplied with cooking bananas. About 30,000 farmers were given suckers by the institutions. SPDC and NAOC alone accounted for 99% of the farmers reached with the crop. On average, SPDC reached 59 farmers per village with suckers, while NAOC reached 26 farmers per village. These were the highest figures obtained among all the institutions. Among the national agencies, the best distributor was the MOA-Cross River, which reached only 3 farmers per village. The above results clearly indicate that the NPOs out-performed the national agencies in the dissemination exercise. In essence, without their efforts and involvement, the majority of the villages and farmers would not have obtained the crop. Unfortunately, the involvement of NPOs was limited to villages within the areas where they carry out their main activities. As a result, the cultivation of cooking bananas in Southeast Nigeria is concentrated in Bayelsa and Rivers States where SPDC's and NAOC's oil exploitation activities are concentrated. A breakdown of the distribution per state shows that 84% of suckers were distributed in these two states. The high performance of the NPOs is mainly attributed to the fact that they have large financial resources, which enabled them to distribute suckers over a long period of time, to provide field incentives and better transport facilities to extension agents. SPDC had the highest number of years (9) of sucker distribution, while NAOC distributed during 6 years. Among the institutions that distributed cooking bananas, only a few provided incentives to their field staff such as on-field residential accommodation, payment of field allowance as well as

transport allowance. SPDC and NAOC showed more commitment in the provision of these incentives than national agencies. The on-field residential accommodation was provided by SPDC alone. The majority of the national agencies had poor transport facilities, which greatly impeded their efforts. In some situations, the national agents had to make use of the public transportation. The problem of inadequate transport facilities and lack of incentives is not common to Nigeria only, but to most of the less developed countries (1). In Africa, in particular, Arnon writes: "Some of the extension problems in Africa are associated with poor terms of service, living and working conditions. Pay and allowances are less than those of their peers working for parastatals or private sector organisations, ...". In Guinea and Sierra Leone, Zinnah *et al.* (11) remarked that major problems encountered by the extension staff in the dissemination of mangrove rice varieties were, among others, inadequate mobility and lack of incentives.

Conclusion and recommendations

The study has examined the relative performance of the public (POs) and non-public (NPOs) organisations in the dissemination of cooking bananas in Southeast Nigeria. The general performance of the POs was poor compared to the NPOs. Results indicate that the NPOs supplied about 90% of suckers distributed in the region; SPDC supplied about 73% and NAOC 16%. They both reached about 75% of villages and 99% of farmers supplied with the crop. In essence, without the efforts and

involvement of the NPOs most villages and farmers would not have obtained the crop. Unfortunately, the involvement of the NPOs was limited to villages located within the areas where they carry out their main activities, i.e. oil exploration / exploitation. As a result, about 84% of suckers distributed in the region were concentrated in two states, namely Bayelsa and Rivers. Heavy reliance on NPOs is likely to result in an uneven distribution of the crop in the region. In order to redress this situation and make more effective the delivery of the newly-developed plantain hybrids a rural group-based dissemination approach should be considered. As much as possible, the research institution (in occurrence IITA) is to identify and mobilise as many potential disseminating institutions (both NPOs and POs) as possible throughout the target area and have a clear idea of their respective mandate areas. The old system of utilising church and other village groups should be revived, and used to disseminate the new hybrids to the farmers. Disseminating institutions should also be made to establish as many nurseries as possible across their respective mandate areas. This will reduce transportation costs and other logistic problems and also contribute to a more even distribution of the crop within the target area. The use of cheaper and easier methods of production of the hybrids is also encouraged. For instance, multiplication sites of suckers or plantlets using the macro-propagation techniques (with corms and buds), which can be easily handled by the national agricultural extension services, should be considered.

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