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NGO-GOVERNMENT LINKS IN SEED PRODUCTION:

CASE STUDIES FROM THE GAMBIA AND ETHIOPIA

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ABSTRACT

These two case studies illustrate the wide range of approaches that can be taken even to as discrete an activity as seed production. The Gambian case documents initiatives taken by government (with donor support) to improve the quantity and quality of seed supply by working with private contractors, NGOs and donor-funded projects. The Ethiopian case documents efforts by a foreign-based NGO to bring together government agencies and local NGOs in the production of appropriate seed for small farmers. Both cases have had their share of problems: resource constraints in the Gambian case have led to frustrations as only part of a wide mandate could be fulfilled, and parallel initiatives in some spheres are being taken by NGOs themselves. In the Ethiopian case, the reluctance of some foreign-based NGOs to make a sustained commitment to "research" slowed the initial identification of collaborators. Both cases, however, describe innovative collaboration in seed production among institutions of different types. They refute the widely-held view that seed production should lie entirely in the government domain, or, in the case of certain crops, in that of commercial companies. In doing so, they offer insights which may be of value elsewhere.

GLOSSARY

AAE	ActionAid (Ethiopia)
AMC	Agriculture Marketing Corporation (Ethiopia)
ASE	Agri-Service Ethiopia
CPAR	Canadian Physicians for Aid and Relief
CRDA	Christian Relief and Development Association
CRS	Catholic Relief Services
EOC	Ethiopian Orthodox Church
ESC	Ethiopian Seed Corporation
IAR	Institute of Agricultural Research (Ethiopia)
ILCA	International Livestock Centre for Africa
NGO	Non-governmental organisation
PA	Peasant Association (Ethiopia)
SCF	Save the Children Fund
SEED	Seed Enterprise Development Project (Ethiopia)
STU	Seed Technology Unit (The Gambia)

I. INTRODUCTION[1]

Seed production comprises a "stream" in which foundation (or pre-basic) seed is supplied by plant breeders and multiplied up to the registered (or basic) stage, and then subsequently to certified and commercial stages. Quality control is important throughout, and much of the activity, at least in the latter stages, can be conducted by contracted farmers. Seed production is a tightly defined activity encapsulating many of the potential benefits of NGO-government collaboration that arise in the wider context of agricultural technology development. NGOs' close contact with farmers allows them to identify why farmers grow existing plant types and what the characteristics of improved types must be if they are to gain wide acceptance. It also places them in a strong position to test new material with farmers, report back on its performance, and, where appropriate, help to distribute it on a wide scale. The production and multiplication of new types, however, requires technical skills in the characterisation, selection and crossing of genetic material, as well as in the design of appropriate phytosanitary controls and in the interpretation of germination rates. These functions have typically been performed by government agencies.

These views of the respective roles of NGOs and government represent an important point of departure for the two examples reported here. It is worth stressing at the outset that they are innovative in their general orientation: in many countries, government's role in seed production is restricted to the provision of material for commercial-scale crops. Even where food crops form part of government's mandate, resources tend to be limited and unreliable, seriously challenging the notion that government alone can provide an adequate service to farmers, particularly to those located in areas of wide agroecological diversity.

As the experience documented in the following two sections indicates, some progress has been achieved by these initiatives, but not without difficulty. The concluding section reviews how relevant, in the light of experience, these initial premises proved to be, and how far the case studies have succeeded in adapting these principles of mutual complementarity to the local conditions they faced.

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[1] This section has been prepared by the Editor. Readers interested in this theme may wish to consult two excellent papers published by Pakhribas Agriculture Centre, Nepal. . Details are given in the references under Green (1987) and Bhattarai (1989). They may be obtained by writing to the Publications Officer, PAC, c/o BTCO, P O Box 106, Kathmandu, Nepal.

2. THE SEED TECHNOLOGY UNIT IN THE GAMBIA

Background

Conditions in The Gambia make the provision of government services difficult: it is a long (375 km) narrow (10-40 km wide) country bisected by a major river with few crossing points. NGOs' development activities are located in some of the more inaccessible areas (eg. on the north bank of the River Gambia), making them logical points of contact for government research and extension efforts. The Gambia's rapidly increasing population density (from 76 person/km^2 of cultivable land in 1985 to an estimated 91 persons in 1989) and its low level of self-sufficiency in major staples place intensified agricultural production high on the government's policy agenda.

The principal crops in The Gambia are: rice, groundnuts, maize, sorghum, millet and cotton. Table 1 provides estimates of typical areas under cultivation, seeding rates per hectare and likely levels of demand for seed from off-farm sources. The final column provides an indication of the seed production which is in stream to meet these requirements.

Groundnut - is the main cash crop and provides a major source of food in seasons of favourable climatic conditions. It makes up a large proportion of export revenue, much of it through illicit border traffic, in the form of cake and oil with by-products of soap and briquettes. Fluctuations in rainfall and in the incidence of pests and diseases, plus variations in market prices mean that the volumes of groundnut reaching markets have fluctuated widely, estimated at: 1987 - 120,000 tons; 1988 - 40,000 tons; 1989 - 80,000 tons. The main variety (28/206) originated from the ISRA research station at Bambey in Senegal, most seed crossing the border in farmer-to-farmer trade. It was formally recognised by Gambian research and extension services in the mid-1970s, but is now being partly replaced by an earlier-maturing variety (28/206), also from Bambey.

Rice - is the main food crop, mostly cultivated by women in areas of swamp or flood recession. Irrigation schemes have a history of failure due to poor levels of planning, management, and motivation. There are five distinct rice ecologies defined by the depth of watertables, annual flooding

levels, height of the land, soil type and rate at which flood water declines or is retained, each having both traditional and recommended varieties attached to them. The local varieties are of long duration (180+ days) coloured and white with a high palatability and nutritional factor.

Improved varieties have been recommended by government research services for the five distinct ecologies. Unfortunately, however, the supply of foundation seed from the research division has not been adequate to permit sufficient multiplication for large scale distribution (Table 1). Regrettably, nor has sufficient work been carried out by researchers to select promising local varieties which meet farmers' preferences and would serve for bulking up for wider distribution. Such varieties fit into the ecologies already described and although they have a long growing duration, are hardy, often disease resistant and with minimum inputs provide a reliable return on investment.

Maize - cultivation has expanded and spread greatly in the last few years using both officially introduced and farmer-imported seed. These are mainly 90-day yellow varieties. If planted early, they can provide the first supply of food when harvested "green" during the "hungry season", and can be followed by another crop on the same land ie. late millet or sesame. Prices for maize are high in the local markets and in years of scarcity can exceed those of groundnuts. Two widely-grown yellow varieties are NCB (ex-Nigeria) and a local selection known as Jeka. Both are composite varieties and it is therefore difficult to maintain them in their original condition. Attack by wild pig, monkeys and baboons may be a limiting factor to this crop in certain areas in the future.

Sorghum - this rainfed subsistence crop is grown in many areas consisting of white and coloured varieties both loose and semi-loose headed. It is susceptible to bird damage and crop guarding has to be carried out carefully as the crop matures. Again considerable work requires to be done by research to introduce better strains and varieties and to screen local varieties for official recognition and bulking up as seed. Only one improved variety E35, which appears to have a certain resistance to Striga, is in the process of being released but appears to lack palatability. Many local varieties show considerable resistance to drought.

TABLE 1: CROP AREAS, CALCULATED ANNUAL SEED REQUIREMENTS, ESTIMATED SEED REQUIREMENTS AND SEED PRODUCTION IN STREAM

Crop	Area	Seed rate	Annual Seed Requirement	Estimated Seed Demand	Seed Production in stream
Rice	(Ha)	(Kg)	(Ton)	(Ton)	
Upland rainfed	5200	80	750	60[1]	50
Bantofaro	10000	80	750	60[1]	50
Deep Flooded	6000	80	450	30[1]	25
Mangrove	4000	80	320	20[1]	25
Irrigated	1500	50	120	30[2]	50
Irrigated Projects	560	50	56	20[2]	50
Tidal Irrigation	800	50	50	8[2]	50
Upland Crops					
Groundnuts	120000	125	15000	300[3]	10
Maize	15000	30	450	150[4]	60
Sorghum	10000	14	150	28[3]	0[6]
Early Millet	25000	8	200	40[3]	0[6]
Late Millet	15000	8	120	24[3]	0[6]
Cotton	6000	40	240	240[5]	0[7]

Notes:
1 - Most of the seed is saved from previous crops.
2 - Various cropping intensities depending on variable factors.
3 - 20% Annual replacement.
4 - 33% Annual replacement.
5 - 100% Annual replacement.
6 - No seed to be introduced in the near future.
7 - Cotton seed obtained annually from Senegal.

Millet - is the main staple food in most villages grown as both early and late planted crop. It is very drought resistant, but is even more susceptible to bird damage especially near river areas. It has the advantage of containing soil wash when planted early in areas of extensive and permanent cultivation. Early millet can be followed in the same year with a catch crop of sesame, cowpeas, or other short duration crops.

Cotton - is being grown in the Upper River Division and is being spread to certain areas of the MacCarthy Island Division. The annual target of 3,000 tons is seldom realised, owing to clashes in labour demand with food crops and high pest incidence. Two varieties with differing characteristics have been introduced from neighbouring countries, but some cross-pollination of these two varieties has taken place and efforts are in hand to introduce a new variety for Senegal.

Sesame - has been grown at village level for many years for local oil extraction and consumption but seed in the past has been mixed with that of bitter varieties having lower oil content. The Catholic Relief Service (CRS), a Canadian-based NGO, has pioneered the introduction of improved white varieties over the last few years which are gradually replacing all other types (See Annex 1).

Government Service Bodies

The Department of Agriculture is divided into two sections, each with its own Director, Deputy Director, and support staff, one dealing with extension and the other with research and allied services. The research division has two stations, one at Yundum near Banjul at which is situated the headquarters, and the other at Sapu 300 km up the Gambia river. Sapu research station has units for cereal, legumes, rice and Seed Technology. The crop units are responsible for variety screening, evaluation of imported seed varieties and the production of foundation seed for the seed technology unit for multiplication through the registered seed stage to certified seed for country wide distribution. This is carried out through a network of contract growers some of whom work with NGOs and others directly for the STU itself. Overall policy in the seed sector is directed through a National Seed Council on which all interested parties are represented.

The Seed Sector - Government

Government efforts to provide seeds have been piecemeal and of limited duration. The Seed Multiplication Unit, now re-named the Seed Technology Unit, was established in 1972 to provide the nucleus of a seed industry. Donor assistance was obtained from the UK (ODA) for buildings and equipment. Further funds were obtained from FAO and from the IMF/World Bank Agricultural Development Programme. ODA has also made a contribution in the past, providing the services of a seed Marketing Officer for two years in 1984-85 and at present, a seed Development Officer 1988-91 for three years. STU is under the station direction of a Principal Seeds Officer who in 1988 took over the additional and time consuming role of Station Manager. At STU, professional staff had shrunk to four by 1989 from a total of 21 staff in 1986.

There have been two distinct phases of policy towards the STU. The initial conception was that it should complement research units by large scale multiplication on the Sapu farm itself. This proved effective but costly. The policy was changed in 1986 when the role of the STU was reduced to that of seed testing and certification. It was also required to act as a distribution outlet for foundation seed to private contractors for multiplication and to conduct quality control testing. However, with the exception of rice, very little seed of suitable quality, spread and quantity has been provided by the responsible research units for STU to handle in this way (Table 2).

To supplement the poor supply of foundation seed in groundnuts it was arranged in 1989 to import 5000 kg of variety 73/33 from Senegal. This was required to give the basis of a seed stream to satisfy the requirements of NGOs who are the STU's main contracting agents for multiplying up seed each year.

Despite the paucity of foundation seed from research, the substantial volumes of seed were in stream in 1989 (Table 3). The progress of rice and maize can be regarded as satisfactory in the circumstances but groundnut seed poor, with no millet, sorghum or beans being multiplied.

To these totals will be added foundation seed yet to be obtained in 1990 from research, some of which will be passed directly to NGOs for seed stream multiplication and the rest retained within STU for its own programme and testing. The poor seed growing year of 1988 due to the rain pattern reduced the amount of seed that could be produced and certified over all crops certified.

TABLE 2: FOUNDATION SEED PROVIDED FROM THE RESEARCH SERVICES TO STU (Kg)

	1987	1988	1989	1990 (quantities requested by STU)
Maize	nil	420	300	(1000)
Rice	nil	1485	1837	(3800)
Groundnuts	40	140	241	(2000)
Millet	nil	nil	nil	(50)
Sorghum	nil	nil	nil	(150)
Beans	15	nil	nil	(100)

TABLE 3: QUANTITIES OF SEED IN STREAM AT STU

Crop	Production 1989	Sale Availability 1990/1 to Farmers
Rice	160(R) + 445(C) tons	445(C) Tons
Maize	20(R) + 142(C)	142(C)
Groundnuts	41(R) + 18(C) + 250(C2)	18(C) + 250(C2)

NOTES:
(R) = Registered Seed
(C) = Certified
(C2) = This is seed which should have already been issued for commercial production but because of chronic seed shortage it has been multiplied once more before sale to bulk up the quantity.

To facilitate the purchase of seed by STU contractors from foundation to the registered seed stage, a seed revolving fund was set up in 1984. Bad debts had caused this to decline in value by almost two-thirds over the following two years, but the fund is now being managed on a commercial basis and is likely to be increased to facilitate flows at the foundation to registered seed stages. Charges are now made, for instance, for all laboratory sampling carried out for outside agencies. However, the sale of seed at the certified stage by all contracting farmers is being encouraged on a farmer to farmer basis to eliminate past losses in the handling agencies. This also ensures that contract growing farmers can obtain the highest price for their certified seed either for cash or on a barter basis.

A seed laboratory was established in 1979 and was equipped with a full range of seed testing equipment and materials by FAO. ODA subsequently provided some support in the form of spares. Staffing the laboratory with suitably trained officers has always been problematic. The work is not popular because for 6 to 7 months of the year during the main seed testing season (November to May) much work has to be carried out on a longer than average working week. The laboratory continues to provide seed analysis and certification services for foundation, registered, and certified seed multiplied by individual NGO, STU contractors and other organisations, and for seed imported into the country. It also provides this service to commercial farmers and to all agricultural projects in the country. The time factor between receipt of samples and posting out results has been reduced to a maximum of three weeks but is often much less depending on the average quantity, quality and types of samples received and the type of analysis which has to be carried out on each. Speedy certification is essential once the designated seed is sampled on the farm or point of production/storage so that, if accepted as certified seed, it can be treated with chemicals against insect attack and brought into controlled storage as soon as possible. The standard at the time of sampling is thus maintained. It also enables speedy settlement of payments due to the contract farmers. It is hoped to reduce the time factor to a maximum of two weeks between receipt of the seeds for testing and dispatch of results but this depends on the future staffing situation at STU.

During 1988 and 1989 STU was actively engaged in the training of both NGO extension personnel and general extension workers. STU contract farmers were trained in a series of field days. In the area of extension staff training, STU was supported by an input from Winrock International.

Each extension worker was covered by two, two-day courses based on a seed multiplication manual compiled at STU. This covered the whole process of seed production in two parts: a) harvest to planting and b) planting to harvest. The total attendance amounted to 77 staff. These staff are now equipped with background knowledge and a field manual to facilitate their work in crop isolation, roguing, field inspection and seed sampling. Farmers attending field days at the Sapu research farm are themselves issued with improved seed to take it through the next multiplication stage (from "registered" to "certified"). This has been grown from foundation to registered stages by a group of local contracting farmers cultivating on-station to high levels of husbandry. These levels of husbandry produce high multiplication rates, and the intention is that visiting farmers should adopt many of the same practices when they return to their own farms to conduct the same stage of the multiplication process.

TABLE 4 NUMBERS OF SEED SAMPLES TESTED BY STU

Year samples	Cereal	Legume	Total
1985/86	97	61	158
1986/87	26	267	293
1987/88	90	402	492
1988/89	141	525	666*

* Abnormal year due to large scale sampling at village store level to assess the quality of groundnut and other seed for the following year in view of the poor climatic conditions under which it was grown.

NGOs handle approximately the same volume of seed as private farms in contracting with the STU to multiply seed from registered to certified stages. A particular advantage of working with NGOs is their geographical spread into areas which government services find difficult to reach. Regular meetings have been instituted between NGOs and the STU to review progress on seed production activities and to allow wider-ranging exchanges on agricultural issues.

TABLE 5: THE AREA OF REGISTERED SEED FROM STU MULTIPLIED UP BY DIFFERENT TYPES OF AGENCY, 1989-90 (ha.)

	NGOs	Private farms	FAO projects
Rice	60	41	3
Maize	36	46	50
Groundnuts	-	-	270

Note: Little groundnut seed was available through STU for this season (owing to poor growing conditions in the previous season).

The functions of the STU/NGO Coordination Meetings are:

- To discuss the introduction of new varieties
- to review the past seasons and attempt to get some idea of the current seed stream
- to determine NGOs' seed requirements for at least one year ahead and to discuss likely seed prices

- to discuss any problems that NGOs might have with seed sampling, implementation of STU laboratory results, seed storage and preservation

- to note any reactions by the individual NGOs to the seed already in stream and to note their preferences for future multiplication levels

- To identify any further training requirements

- to identify any simple seed sampling aids that the NGOs can purchase from their own internal finance so that they can check to a limited extent seed to be sent to STU for certification; eg. moisture meters, probes for sampling out of bags, sample bags and labels etc.

Information flows from NGOs to the STU reflect farmers' preferences for particular varieties. In certain cases, eg. where locally selected types of rice have adapted to highly specific environments and cannot be improved upon by anything available from the research services, NGOs (eg. Freedom from Hunger Campaign) have been selecting high-performing types from individual farms in order to multiply them up and make them available to other farms or villages facing similar conditions. As part of this process, a check is made with STU on the seed properties of the material. Farmers' preferences have been particularly strongly expressed in certain cases. For instance, the rice variety Peking was introduced several years ago in a now-defunct project. Foundation seed is still being produced, however, since the demand from farmers (and from the NGOs that represent them) is still high. It is a short duration (80-90 days) crop, allowing flexibility in time of planting. It is also moderately resistant to blast, has a good yield average of 5.2 t/ha and is reasonably tolerant to drought.

3. ETHIOPIA - THE SEED ENTERPRISE DEVELOPMENT PROJECT (SEED)

Background

An associate of a UK-based NGO - ActionAid - in Ethiopia is a qualified agriculturist having worked as a research officer in Nepal, and with considerable experience of seed supply systems in East and West Africa. Awareness of the inadequacies of seed supply to small farmers in Ethiopia encouraged him to obtain funding from an NGO (Band Aid) and official (UK Joint Funding Scheme) sources for SEED. Technical support is provided from the Edinburgh School of Agriculture.

The model for a seed enterprise better able to serve village-level requirements that was developed by SEED (Figure 1) is an adaptation of experience gained elsewhere to suit local agro-ecological, socio-economic and institutional conditions. The main instrument in identifying these local conditions was a topical rapid rural appraisal at household, peasant association and Service Cooperative levels which was carried out in 6 areas of Bale, Southern Shewa and Northern Omo Regions. This indicated the following features of the local seed system:

a) There are recurrent shortages of seeds of various kinds at the household level. These shortages occur consistently in the households of poorer farmers. When crop failures result from natural disaster the occurrence of seed shortages is widespread. Subjective estimates by the members of Service Co-operative and Peasant Association Executive Committees (who are normally among seed surplus households) indicate that between 25-50% of the households in the peasant associations have to borrow or buy seeds of one kind or other every year.

b) This shortage of seed at household level may be attributed to three main reasons: (i) insufficient land (ii) lack of draught animals for ploughing and cultivating enough land, and (iii) insufficient crop yields - all leading to the fact that seed takes second priority at the time of food shortages.

c) In some peasant associations most seed transactions take place between neighbours and relatives as the "borrowers" have confidence in seeds from a crop stand which they have seen. Apart from this, the extent of borrowing also depends greatly

on the size and frequency of the local weekly markets nearby. Almost invariably the seed borrowing is reported to be interest free and payable in a variety of ways. At times it was felt that the interest free transaction was emphasised because the local official system discourages informal loans with interest.

d) In other peasant associations most of the demand for seeds in the deficit households is satisfied by local weekly markets. It was evident that the nearness of a good local market actually discourages farmer to farmer borrowing within a small geographical area such as a peasant association or village.

e) In each peasant association or village, most farmers are able to identify others who consistently maintain good standards of husbandry and who are evidently also among the seed surplus households. In contrast, the seed sellers in the market places were not necessarily identifiable by the buyers.

f) With one exception, none of the Service Co-operatives has been involved in seed trading other than relief supply of seeds given free by indigenous or external organisations in recent years. The co-operatives attribute this to the fact that they do not have sufficient capital to take on such ventures. Alternatively, this can be explained by a lack of business initiative or motivation on the part of members of the Executive Committee who often are the people involved in the local private seed trade.

g) The one service co-operative which has been involved in a kind of seed trade has been doing this for the last 8 years. Their procedure is as follows: The Service Co-operative surveys the demand for seeds from member households and forwards this estimate to the local MoA office which in turn decides on the most suitable variety (but not always on the basis of the field testing within the particular geographical area). MoA, through its Agricultural Input Supply Corporation receives the seeds from the Ethiopian Seed Corporation and delivers them to the Service Co-operative for distribution. The cash for seed purchase in the first instance is released by the Agricultural and Industrial Development Bank at the estimated interest rate of about 20% per annum for a short period of less than 3 months. Seeds are sold by the Service Co-

operative to farmers on cash payment at the buying rate including the interest of the bank: the price of this, for example in case of maize, was twice the price of seed in local markets at the time! On one or two occasions in the last 8 years, seeds so received have been found to be of poor quality, with broken and insect damage seeds resulting in poor germination.

h) The price of seeds at the time of planting is between 30% and 100% higher than the grain price at harvest but this difference narrows as the planting season approaches to between 0% and 15%. In the case of maize the difference can go up to 30% as it is relatively difficult to store seeds of this crop.

i) Farmers in each peasant association generally cultivate up to 5 varieties of the main crops and individual farm households often grow up to 4 varieties. This positive "diversification" is explained either in terms of insurance against unpredictable rainfall or in terms of different utilisation. The decision as to what variety to grow is often dictated by the availability of seeds. Invariably, farmers are able to distinguish one variety of crop from others particularly by observation of seeds.

j) There appears to be a tradition of seed replacement in the varieties of major crops. Households report a decline in the yield of a particular variety after 5 years or so. There is variation in opinion within and between the peasant associations as to whether this decline is attributable to "variety deterioration" or to some soil fertility factors. Accordingly, either seeds are replaced from the neighbourhood or from the market or crop rotation that is practised.

k) Farmers are aware of the quality attributes of seeds and normally go through some logical selection process. For example, they buy seeds:

- from farmers but not grain merchants
- which are not damaged by insects
- which are free of weed seeds, particularly wild oats

- with colours indicating that the grain was stored under "smoked" conditions - and therefore likely to be free of pests

- grown in the same locality and ecological range

- which are of full-size and not shrivelled.

Seed transfer within villages has the added advantage that the seed crop can be observed in the field. However, the socio-economic interaction patterns in the community do not necessarily allow the seed borrowers to shop around on the basis of field performance of the standing crops. Consequently, there is not a true "seed market" within the community.

Proposed Model of a Seed Enterprise

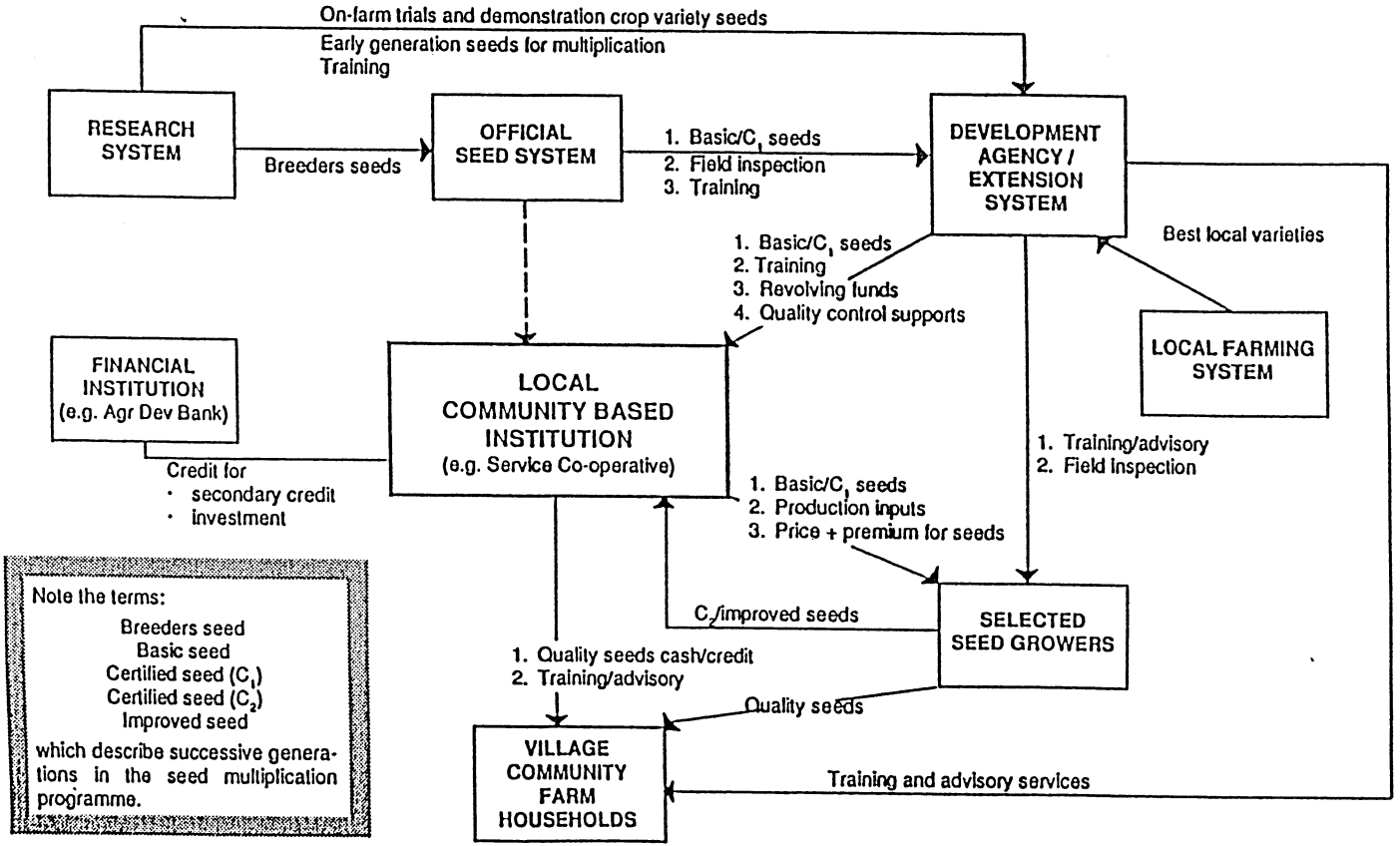
The appraisal helped to elucidate the nature of the seed problems in the pilot site areas but the suggestions of the Service Co-operatives and field extension staff also greatly influenced the design of the model. The model also borrows concepts and practices from the seed programmes and activities of Pakhribas Agricultural Centre, Nepal, an ODA funded research and development project, from ActionAid and SCF-USA in The Gambia and from the On-Farm Seed Project of Winrock International in "SeneGambia". Ideas have also been incorporated from the Karamoja Seed Scheme in Uganda.

A diagrammatic representation of the model is shown in Figure 1 and its main features may be summarised as follows:

a) At each site the proposed seed enterprise will be institutionalised at the Service Co-operative level because the Service Co-operative is the only truly local operational and development entity and also because each of them have related experience, ability and desire to be involved in seed trading.

b) Varieties of most crops are available from the research system but their field testing is very limited or non-existent. Therefore, on-farm variety testing will be an integral part of the model but the major role in this will be played by the

Figure 1: Diagrammatic representation of the proposed model for a seed enterprise.



extension system while the Service Co-operatives will participate in farmer selection. Seeds will not be multiplied without at least one year of testing in the area.

c) Seeds of the 2-3 most important crops will be handled by the SCs in the first two years. All seeds to be sold by the SCs will be produced within the geographical boundaries of their catchment areas.

d) Early generation seeds for multiplication will be bought if possible from the Ethiopian Seed Corporation (ESC) but alternatively from the Institute of Agriculture Research (IAR). Attempts will be made to acquire Basic or C1 generation seeds but alternatively C2 seeds can be multiplied to produce an "improved" grade of seeds for commercial production.

e) Initially, the participating NGOs will assume the main responsibility for acquiring and providing early generation seeds to Service Co-operatives at cost price including transport but with the expectation that in due course this will be done by the MoA extension system.

f) Service Co-operatives will identify, with the help of extension agents, contract growers in their Peasant Associations and provide seeds, fertilisers (if available) and any other specific production inputs required for seed multiplication. The formal contract agreement with the seed growers will specifically mention the proportion of seeds to be sold to the cooperatives at a fixed market price with an added premium if the seed quality exceeds a stated standard. The agreement should also mention that the cost of inputs provided to growers on credit will be deducted when payments are made for the seeds bought back from growers.

g) All inputs for production, processing, storage and marketing to Service Co-operatives will be provided from a specific account on a revolving fund basis fully managed by them. All technical assistance, extension services and capital costs such as seed storage and cleaning equipment will be provided on grant. Once the revolving fund reaches a size where it is self-sufficient, grants will cease.

h) In terms of institutional linkages and roles, the **Ethiopian Seed Corporation** will provide early generation seeds, train extension workers in field inspection and seed quality procedures and will test seed samples for the project pilot sites. A formal agreement with ESC has still to be finalised. The **Institute of Agricultural Research** will provide seeds and technical back-up for on-farm variety testing and will also be an alternative source for seeds when ESC is unable to supply the required type, variety and quantity for multiplication. It has been found that IAR are rather more willing and flexible in supplying seeds for multiplication while ESC is naturally more interested in selling seeds for commercial cropping. The **extension network**, particularly of the collaborating NGOs at this stage but ultimately of MoA, will have the function of providing training and advisory services, technical back-stopping, varietal testing, seed crop inspection and seed sampling for laboratory testing. **The Service Co-operatives** will have the sole responsibility for running the seed enterprise as a profitable venture in terms of seed production, seed purchasing, storage and marketing. Seeds of good quality will be available to the peasant farmers at a reasonable price either for cash payment or on credit.

Workshop

During the period when negotiations with NGOs for collaboration in the project were being held, it was felt that it would be helpful for NGOs and the relevant government agencies to come together at a forum in order to review past seed activities and clarify various issues with the aim of identifying a relevant role and activities for NGOs in the field.

A proposal was put to CRDA for a jointly sponsored workshop which would have resource support from the International Livestock Centre for Africa (ILCA). CRDA were pleased to incorporate the workshop in their regular programme from their own funding but required technical support in planning and running the workshop, and this was provided by the ActionAid Field Officer.

The workshop was attended by a number of NGOs, the Ethiopian Seed Corporation, Plant Genetic Resource Centre, Institute of Agricultural

Research and ILCA. Despite a high level of initial interest and written acceptance the actual attendance of NGOs was somewhat disappointing.

However, the workshop was beneficial as it helped all the participants and the Field Officer to:

- understand national seeds policies, programmes and institutional linkages;

- discuss the role and scope of NGO interventions in seed-related activities at grass roots level and the various technical supports available from government institutions;

- clarify the scope of and distinction between genebank, seed bank, strategic seed reserve and seed enterprise at the community level

- an area in which considerable confusion exists particularly with regard to terminology;

- discuss past experience of various community seed programmes of NGOs notably of Oxfam UK and CPAR;

- understand basic technicalities involved in organising and developing seed programmes in the field;

- discuss some guidelines for future seed programme development among which were the following three important points:

    a) as far as possible, seeds should be produced locally so as to avoid logistical and technical problems arising from the transport of seeds from outside the area;

    b) strengthen the capacity of Service Co-operatives to undertake seed supply to peasant sector;

    c) proper training and networking should be emphasised in the seed programmes.

Since it is beyond the present scope and funding capacity of the SEED Project, the Ethiopian Seed Corporation (ESC) made an initial proposal

to hold a series of training workshops on seed technology for the field staff of NGOs involved in seed activities. Further discussions and sources of funds for this are being investigated with the ESC.

Collaboration Agreements

In late 1989 it was decided that, in view of the political situation, attempts would not be made to locate any of the pilot project sites north of Addis Ababa. As a result the list of candidate collaborators was considerably reduced. As the general situation in the north deteriorated, efforts were made to find sites in Harargeh and Northern Omo Regions. It was a disappointment that two interested NGOs - Catholic Relief Services and Concern - expressed their inability to collaborate. The decision appears to have come not from the technical levels but more from the management which was perhaps concerned about the research component of the project or suffered the common territorial attitude resulting in reluctance to collaborate with "external" projects. Initial discussions with technical staff had been positive and fully optimistic, signalling a keen interest in seeds.

Despite this setback, contacts were pursued actively with Agri-Service Ethiopia (ASE), an Ethiopian NGO with an excellent track record of development work for the last 17 years in various parts of the country. At the same time the Ethiopian Orthodox Church approached the project for collaboration in one of their target areas. Agri-Service Ethiopia expressed their interest in having pilot sites in Bale and Northern Omo Regions while Ethiopian Orthodox Church (EOC) were interested in a seed enterprise in another part of Northern Omo Region. Further discussions with technical field staff and initial field visits showed that:

- both agencies had strong agricultural development programmes in the field;

- both agencies had recorded in their need assessment survey that farmers regarded seed as one of their main constraints particularly in terms of quality, price, absolute availability and timely delivery;

- the agencies had already been involved in seed distribution and/or seed bank activities; and

- the SEED Project would complement their overall development programmes in their target areas.

Against this background, separate agreements with these two NGOs were signed and formalised. This opportunity for collaboration with indigenous NGOs is seen as a positive gain since they may have better staff continuity. Altogether the project now has 3 NGO collaborators including the ActionAid (AAE) site in the Southern Shewa Region.

Identification of Pilot Sites

In identifying pilot sites within the target areas of the collaborating NGOs, appraisal discussions were conducted with the field extension staff of the agencies, local Ministry of Agriculture staff, executive members of the Peasant Association and service Co-operatives and a number of farmers in each Peasant Association. The following criteria were taken into consideration in identifying potential project sites.

- each pilot site and the peasant associations included within the target Service Co-operative should be fully covered by the collaborating agencies;

- the area should have extension services available from the collaborating agencies;

- the Service Co-operatives must have previous experience of seed transactions and have the managerial ability and desire to undertake the seed enterprise;

- the nature and extent of seed and related problems within the target areas should be broadly similar.

On the basis of these criteria, the Service Co-operatives and their catchments indicated in Table 6 were selected.

Conclusions

The major activities of the SEED project up to March 1990 included continued contacts and negotiations with the potential collaborators, identification of pilot project sites, initial appraisal of the rural seed system in these sites, training and the organisation of a workshop and finally

TABLE 6: NON-GOVERNMENTAL AGENCIES IN THE SEED PROJECT

SERVICE CO-OP	AGENCY	REGION	NO OF PAs	MAIN CROPS
1. Ebot Gogora	AAE	South Shewa	10	Teff, maize, wheat sorghum, haricot beans
2. Gulgula	EOC	North Omo	4	Teff, haricot beans, sorghum, wheat, chickpea, faba beans
3. Chileshe	ASE	North Omo	4	Barley, wheat, beans, sorghum, maize, teff
4. Zephano	ASE	North Omo	4	Maize, teff, sorghum, haricot beans, chickpea
5. Chiffaro	ASE	Bale	4	Wheat, barley, pea, faba beans, teff
6. Maliyi Burka	ASE	Bale	4	Barley, wheat, oats, peas, faba beans, teff

KEY: AAE - ActionAid (Ethiopia)
EOC - Ethiopian Orthodox Church
ASE - Agri-Service Ethiopia
PA - Peasant Association

developing a model seed enterprise to be tested in the pilot project sites. Despite the initial slow pace of progress the project has achieved its targets as set out in the original plan of work.

While Ethiopia continues to suffer from war in the north and recurrent famine, major political and economic changes were announced by the President in late March 1990. Apart from a broadening of the political base of the Government (by changing the party name and inviting other factions to join), economic policies have also taken a turn towards free enterprise and a market economy. For example, the AMC quota requirement from rural households has been abolished, people can own land and transfer ownership to their families or to others and, equally significantly, they are allowed to withdraw from producer co-operatives. The Government appears to remain as secure as ever. In the relative peace of southern Ethiopia where all the SEED Project sites are located, the situation has never been too bad, except during the time of conscription, but the recent policy changes should create a more favourable environment for the project.

4. CONCLUSIONS[2]

Problems and Prospects in The Gambian Case Study

Although the STU has made a start in providing seed quality control services to NGOs, to private growers and to others, and in managing the stream of activities from foundation through registration to certification, there remain a number of difficulties which have limited its effectiveness. These, and the prospects of overcoming them, are discussed here.

(i) **STU resources:** The STU in recent years has been plagued by shortage of resources. Two of its three vehicles were damaged in accidents, and it has proven extremely difficult to recruit the full complement of Gambian staff. Those recruited have been absent on training courses for lengthy periods. Additionally, the head of the STU has been required to act as overall manager of the Sapu research station. Whilst the STU has managed to maintain a high throughput of seed samples, these resource

[2] This section has been prepared by the Editor and draws on material provided by a number of NGOs in The Gambia through Joan Robertson of the USAID/DARE GARD Project. It also draws on material provided by Peter Henderson.

constraints have made it difficult to make adequate field visits to check on eg. the results of spacing recommendations made in the light of expected germination. They have also contributed to low STU representation at meetings such as the bi-monthly National Advisory Committee on the On-Farm Seed Storage Project, and have limited the opportunity for informal contact between STU and NGOs.

(ii) **Availability of foundation seed:** The national research service has the responsibility of providing foundation seed to STU. Given its limited resources, some crops are inevitably of low priority to researchers (see Gilbert, 1990), such as sesame, which consequently attracted the attention of CRS (see Annex 1). Resource constraints similarly limit the extent to which research services can help in the selection of local material for highly specific ecosystems such as rice grown on flood recession. Again, NGOs have begun to fill this gap. The problem, though, is not entirely one of resource constraints: researchers inevitably feel more secure in work conducted under close supervision on-station and, as in many other countries, have historically been reluctant to subject themselves to the uncertainties of on-farm work in difficult environments. A further set of difficulties lies in the cumbersome procedures of official "release" of new varieties, and what appears to be an excessive amount of prior research before new material is released. One result is that official procedures (to which the STU is bound) are, in some instances, outstripped by the informal import of seeds by NGOs and by farmers themselves.

(iii) **Personalities:** As in other countries, NGOs in The Gambia tend to be staffed by strong personalities, as is the STU. Some clashes and misunderstandings have therefore been inevitable. NGOs' ability to import seed informally contrasts with the STU's mandate to work with officially-released varieties, leading to unjustified allegations from one NGO that it "pushes pet varieties". At the informal level, given more open attitudes and less pressure on limited staff resources, the STU would have more time and inclination to meet NGOs in the field to gain a better understanding of the rationale for working with varieties other than those officially released. This would also allow wider field examination to be made of the germination levels of seed that had passed through the STU, and therefore provide useful feedback on its laboratory testing. At the formal level, some change in the STU mandate, in parallel with the provision of

additional resources, appears necessary if it is to serve NGOs and farmers working with crops for which research services cannot provide adequate foundation seed.

Problems and prospects in the Ethiopian case study

Perhaps the major challenge in the Ethiopian case has been for the SEED Project to demonstrate to NGOs the advantages of participating in an integrated approach to seed production and supply. The need for on-farm testing of varieties produced by government - which the Project aims to fill - has implications of "research" and long-term commitment which at least two NGOs have found unacceptable. This raises a wider dilemma for the NGO community: agricultural change, even where it relies on apparently simply technologies, often raises complex questions which demand specific skills. It is therefore fallacious to suppose that ideas successfully introduced elsewhere can be introduced into new situations without careful modification, or that NGO work involving agricultural technology can produce quick developmental impact and does not require sustained effort. Many NGOs apparently fear that their donor constituencies will respond negatively to anything that smacks of "research", regarding this as an issue within the domain of government. Yet, as the two case studies presented here demonstrate, the capacity of government to conduct research relevant to small farmers is limited, especially if the agro-ecological conditions under which they operate differ from those to which government's attention is mainly directed. Appeals by NGOs to their supporters now frequently highlight work in community development and empowerment of the rural poor. To explain to supporters the importance of sustained attention to agricultural technology development may not, therefore, be as difficult a step as many suppose, especially if, as in the Ethiopian case, it involves efforts to create sustainable institutional structures by bringing together government services and local NGOs.

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ANNEX 1: NGOs and seed production without links to the public sector - the case of Catholic Relief Services and sesame in The Gambia[1]

The limited resources of official bodies such as the Seed Technology Unit, and the limited range and quantity of foundation seed that agricultural research services are able to supply, makes it impossible for the public sector to cover the full range of requirements in a country such as The Gambia. The efforts of CRS to introduce sesame illustrate what NGOs can achieve from their own resources.

In 1978-79, CRS began joint trials on sesame and sunflower with government research services at Yundum and Sapu in response to nationwide shortages of oils having high protein and calorific value. Both production and processing were integrated in their approach, 3 diesel-powered oil presses being installed in villages in 1980. In 1982, CRS offered sesame to farmers in one village to permit comparisons with the longer-established sunflower. Although sunflower had performed better than sesame on-station under high management levels, the reverse was true on farmers' fields, and the drought-resistant properties of sesame enhanced its popularity. Sesame gained a reputation of performing well when other crops were badly affected by drought. By 1984, approximately 1,000 ha were planted, rising to 5,000 ha in 1985 and 8,000 ha in 1986. Although the number of presses has risen to 16, problems with processing and marketing appear now to be slowing its adoption.

CRS, through its contacts in Latin America, is experimenting with a number of 90-day varieties alongside the widely-adopted 120-day variety. Seed for the latter is produced both by CRS (approximately 500 kg/yr) and by farmers who have been encouraged to set up their own seed production. In 1989 successful farmer multiplication took place at 14 centres.

The maintenance of varietal purity has been a major issue in sesame seed production. The preferred white varieties are frequently cross-pollinated by black, giving a bitter flavour. CRS would prefer the STU to offer a selection service if it had the resources. STU has conducted some germination testing but this has proven difficult and time-consuming, given that sesame requires critical amounts of moisture for germination.

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[1] This section draws heavily on material supplied by Solomon Owens, Coordinator of Agricultural Projects for CRS, and Glen Knapp, Regional CRS' Agricultural Adviser, and conveyed through Elon Gilbert and Joan Robertson of the USAID/Department of Agricultural Research Gambia Agricultural Research and Development Project. The Editor, who is responsible for this section, is indebted to all of these.

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