

# Making seed of improved groundnut varieties more accessible to smallholder farmers: Lessons and alternative approaches in Malawi

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## Abstract

This paper details the seed supply experiences of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Malawi. ICRISAT has developed about five high yielding, market-preferred and well-adapted improved groundnut varieties in Malawi, but no seed companies have shown any interest in producing and marketing of seed of these varieties due to low profit margins. ICRISAT, under Irish Aid funded Malawi Seed Industry Development (MSID) project initiated two seed production and distribution models in Malawi. First, certified seed of five improved groundnut varieties was produced by use of contracted farmers of NASFAM under a “buy back” scheme facilitated by ICRISAT. At the same time, the project also facilitated certified seed production by some seed companies for marketing through available agro-dealer networks. Much of the seed from this model was channeled through the agro-dealer networks under the Government’s Farm Input Subsidy Program (FISP). In three years, from 2010–2012, about 400 t of certified seed of the most preferred improved variety, CG7, was produced and distributed each year to resource-poor households in Malawi. In remote areas with poor road infrastructure, a second model of seed banks was initiated to deliver seed of improved groundnut varieties to farmers. These two seed delivery channels enhanced adoption of CG7 from 20% to about 90%. Although the MSID project established formal and informal seed production structures in Malawi, the success of the seed delivery model was mainly attributed to FISP that was able to overcome the inaccessibility constraints of seed unavailability and unaffordability. One of the main lessons learnt is that a suitable seed delivery model is location specific, and is best determined by undertaking a situational analysis to determine the constraints. Further, a public-private sector partnership, even under FISP, is important for the success of any seed delivery model in use. Continuous funding of breeder’s seed production remains critical for the success of both CSP and certified seed production models.

## 1. Background Information and Rationale

Malawi has an estimated population of 16.5 million, with 51% of them living below the poverty level (EC Country Strategy Paper 2013). Agriculture is the mainstay of the country’s economy; it contributes about 34% of economic growth, 39% of the GDP, employs 85% of the economically active population and generates nearly 90% of the foreign exchange-earning (Mucavele 2010). Agriculture in Malawi is broadly divided into large-scale farming and small-scale farming. The former comprises mostly cash and industrial crops such as tea, tobacco and sugar cane whereas the latter is for most food crops such as cereals and legumes.

Groundnut is the most widely cultivated legume in Malawi and accounts for 25% of household’s agricultural income (Diop *et al.*, 2003). In addition to income generation, groundnut is also an important food security crop for the rural and urban populace. Furthermore, it improves soil fertility by fixing atmospheric nitrogen. While research yield potential is 3000 kg ha<sup>-1</sup>, the average smallholder farmer’s yield is less than 800 kg ha<sup>-1</sup>.

The yield difference between researchers’ and farmers’ fields was attributed to three main reasons. First, there was a lack of improved varieties; farmers grew mixtures of traditional varieties. Second, seed production and distribution networks were underdeveloped to disseminate quality seed and most farmers relied on recycled seed. Third, there was poor extension to disseminate information

on best practices for groundnut production. ICRISAT has groundnut as one of its mandate crops in Malawi and had to adopt a multi-prong approach to address the productivity constraints.

To address variety development constraints, ICRISAT, in collaboration with partners, developed and test-adapted on farmers' fields five high-yielding and market-preferred improved varieties of groundnuts<sup>12</sup>. After developing these varieties, wide adoption by farmers was still hampered by inaccessibility of the improved seed to resource-poor farmers due to a number of production and supply constraints, including lack of interest by seed companies citing low profit margins in groundnut seed business. It is against this background that ICRISAT undertook groundnut seed supply initiatives in Malawi with the following key objectives:

1. Deliver improved groundnut technologies (varieties and management practices) to smallholder farmers
2. Initiate and develop public and private sector partnerships in the marketing and distribution of improved groundnut seed
3. Widen the use and impact of ICRISAT's available technologies

This report details the work that ICRISAT and strategic partners have done in Malawi to improve accessibility of seed of improved groundnut varieties. It describes the existing models of seed supply, the Malawi Seed Industry Development Project and ends with lessons learnt and future prospects.

## 2. ICRISAT's seed supply model in Malawi

A 'seed system' is "an interrelated set of components including breeding, management, replacement and distribution of seed" (Thiele 1999). Two broad types are recognized: formal seed systems that produce and distribute certified seed and local, informal or farmer-to-farmer seed systems that produce non-certified seed, often in the process of producing grain. In the recent past, a semi-formal category of seed system has evolved to meet farmers' demand for affordable high quality seed of improved varieties. The three systems often co-exist and are integrated as components of one seed "system". The decision to use one or more components to supply seed to farmers is guided by relative component strength, is usually location specific and often depends on supply constraints. The key supply constraints faced by ICRISAT for groundnuts seed supply in Malawi were:

1. Inadequate number of variety options with preferred household use and market attributes available to farmers
2. Unavailability of Breeders' and Foundation seed of improved groundnut varieties
3. Lack of production and distribution system for high quality seed of improved varieties developed by ICRISAT.
4. Poor adoption of seed of improved groundnut varieties due to high poverty levels among smallholder farmers.

Therefore, ICRISAT initiated production and distribution of formal or certified seed of the five released improved groundnut varieties. Breeder's seed of released improved varieties was produced under the supervision of ICRISAT scientists followed by production of Foundation and Certified seed by contracted individual farmers and farmer associations with a "buy back system" facilitated by ICRISAT and quality certified by Seed Certification and Quality Control Services Unit (SCQSU) of Malawi (Figure 1). This model has been largely used in the MSID project described below. However, in very remote areas with poor road infrastructure Seed Banks were initiated to fill the gap unmet by the formal seed system and the FISP. Under the Seed Bank model, producer groups, extension (for training) and agricultural village committees collaborated in selection of seed beneficiaries who received seed through a "pass on system" with a seed 'recharge' every 4 years.

<sup>12</sup> Improved groundnut varieties released in Malawi are CG7 (ICGV-SM 83708), Chitala (ICGV-SM 99568), Nsinjiro (ICGV- SM 90704, Kakoma (JL 24) and Baka (ICG 12991).

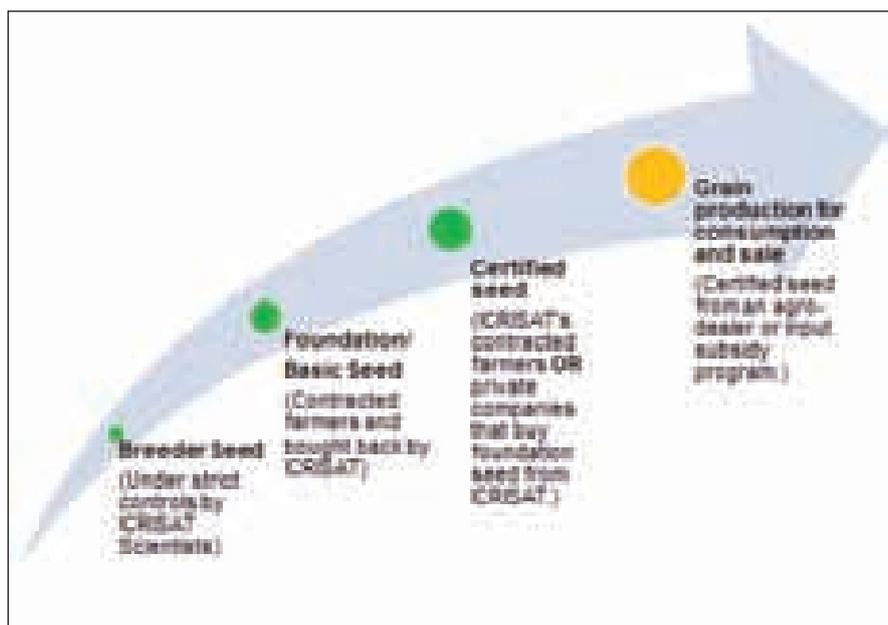


Figure 1. ICRISAT's Certified Seed Production model in Malawi.

### 3. Malawi Seed Industry Development Project

ICRISAT's certified seed production and distribution model was supported by Irish Aid and the Government of Malawi under the MSID project. The MSID project was designed to support the work of the Eastern and Southern Africa Seed Alliance (ESASA) in Malawi. The goal of ESASA is to increase smallholder yields and incomes through the competitive and reliable provision of high quality affordable seed to smallholder farmers. The three primary objectives of ESASA targeting the development of the seed industry are:

- Develop capacity of existing and potential local seed companies;
- Improve the policy environment for seed trade;
- Strengthen the commercial distribution network for improved seeds, complementary inputs, and resulting crop outputs.

Therefore, to meet these broad objectives and ICRISAT's specific objective of widening the use and impact of its available technologies, the project undertook the following activities in collaboration with contracted individual farmers and members of National Smallholder Farmers Association of Malawi (NASFAM), Government of Malawi, selected seed companies and their agro-dealer network, SCQS Unit, Chitedze Research Centre Scientists, extension staff, Citizen's Network for Foreign Affairs (CNFA), Seed Trade Association of Malawi (STAM), Interactive Arts, USA and Community Based Organizations(CBOs):

- Production of breeders and foundation seed of improved varieties
- Facilitation of the production of certified seed by NASFAM and channeling this seed through FISP<sup>13</sup>
- Identification and support for selected seed companies and their agro-dealer networks interested in marketing improved high-quality seed.
- Creation of demand for improved seed through on-farm demonstrations and field days
- Facilitate and strengthen the work of SCQS unit
- Establish linkage with FISP for distribution of seed to needy farmers

<sup>13</sup> Identified seed needy farmers were facilitated to access (by use of seed vouchers) subsidized certified seed produced by ICRISAT and Seed companies from a network of agro-dealers under the FISP.

### 3.1. Contracting farmers for certified groundnut seed production

Under the MSID project, contracting of individual and NASFAM farmers has been central in production of certified improved groundnut seed in Malawi. Hence, some requirements to be met by participating farmers were set by the project:

- Above average in farm resource endowment
- Participation in seed production training course
- Purchase of Breeders' seed or Foundation seed on cash basis
- Agreement and adherence to a seed production contract
- Registration by Seed Regulatory Services as a seed producer
- Verification of status of farms for suitability to produce seed
- Inspection of seed fields by the SCQS during the growing season
- Delivery of harvested seed to ICRISAT at Chitedze Research Centre, Lilongwe
- Compulsory purity tests done by Seed Services Unit
- Payment for seed only after certification is received

### 3.2. Achievements of MSID project

Some commendable achievements were made by MSID project:

- Certified seed of four improved groundnut varieties was produced by contracted farmers and selected companies and distributed through agro-dealer networks and FISP
- In the three years from 2010 to 2012 about 400 tons of certified seed of CG7 (the most market-preferred improved groundnut variety in Malawi) was produced and distributed annually – reaching an estimated 200, 000 households annually.
- Four private seed companies were facilitated to produce and market certified seed of improved groundnuts through agro-dealer networks
- Before this seed supply intervention, the adoption of CG7 was about 20%, but improved to about 90% after the seed supply intervention.

Nevertheless, despite the progress made in the delivery of certified seed of improved groundnuts through FISP and/or the agro-dealer networks, the use of farmer to farmer seed sources remained high at 70% in 2012 (Table 1) and therefore improving the quality of recycled seed needed strengthening. Furthermore, it was not possible for agro-dealers and FISP to deliver seed of groundnuts to all groundnut production areas, especially the remote areas of Malawi. Therefore, an alternative seed delivery model was undertaken to fill the gap.

**Table 1. Sources of improved seed of maize, groundnuts and soybeans for smallholder farmers in Malawi**

| Source of seed     | Maize (%) | Groundnuts (%) | Soybeans (%) |
|--------------------|-----------|----------------|--------------|
| Own stock/recycled | 64        | 54             | 40           |
| Local farmers      | 9         | 16             | 25           |
| Agro-dealers       | 27        | 26             | 30           |
| Other retail shops | 6         | 4              | 6            |
| NASFAM             | -         | 3              | 2            |
| ICRISAT            | -         | 5              | 2            |
| NGOs               | 1         | 2              | 1            |

Source: Farm survey ICRISAT, May 2012.

## 4. Seed Banks

The objective of the seed banks model was to fill the gap in the certified seed production model in which the seed was channeled to farmers through the FISP and agro-dealer networks. Therefore, seed banks model was initiated in remote areas unreached by the formal seed model. The key aspects of the seed bank model were:

- Suitable farmer groups were identified and used as producers
- Extension was used in training of farmer groups
- Village agricultural committees chose “beneficiaries” who received seed through a “pass-on” system
- Recharge seed is provided after four seasons
- Farmers were encouraged to sell or exchange seed informally within the community

### Advantages of seed banks

- Suited to areas with poor road infrastructure which makes certified seed more expensive or inaccessible by resource-poor farmers
- Rapid dissemination of improved varieties within the community
- Groups gained skills in seed production techniques
- Groups have been empowered and are capable to be used as seed growers by private seed companies or contracted individual growers

## 5. Sustainability of ICRISAT Seed delivery models

ICRISAT has spearheaded both formal and informal seed supply models in Malawi mainly to increase adoption and impact of available groundnut technologies, especially high yielding and adapted varieties. This was necessitated by lack of interest by private seed companies to produce and market seed of improved groundnuts because of unattractive profit margins. Therefore, ICRISAT considers the sustainability of seed supply models and their profitability as necessary but not sufficient (the only) criteria for determining the type of seed model to be used to deliver seed to resource-poor farmers. However, there were some aspects of sustainability realized by using ICRISAT seed models in Malawi.

- Partnership structures and capacity for seed production have been established
- Demand for high quality groundnut seed was created
- Complementary links between formal and farmer to farmer groundnut seed models have been initiated

## 6. Lessons Learnt

There were important lessons learnt from ICRISAT’s seed work and MSID project in Malawi, of which key were:

- Subsidized seed distribution facilitated quick adoption of improved groundnut varieties and best practices.
- Community seed production through ‘seed banks’ ensured timely availability of seed and spread of improved varieties in areas usually neglected by the formal seed system. Thus, it can be adopted to ensure availability of seed despite the low profit margins that discourage seed business.

- Despite the emphasis on formal channel of seed distribution, the farmer to farmer seed system remains dominant, but needs strengthening.
- Public-private sector partnerships are critical in whatever seed model one chooses. Channeling certified seed produced by public sector facilitation through the local agro-dealer networks strengthened local seed distribution and marketing networks for future benefits.
- Linkage between formal and informal seed models are important due complementarity and are not mutually exclusive.

## 7. Conclusion and recommendations

A suitable seed model to be used in accessing seed of improved varieties depends on underlying seed accessibility constraints. If the constraints are of emergency nature such as drought or floods in a situation where private seed companies have an interest or are already producing seed of the improved varieties in question, then short-term strategies such as direct seed distribution through public-private sector partnerships could be used. However, if the underlying constraints are of chronic nature such as poverty, unaffordability and unavailability of quality seed due to lack of interest by seed companies to produce and market seed (as in the case of improved groundnut varieties in Malawi), then public sector intervention is justified as in the ICRISAT model in Malawi. That is, where the private sector has failed to avail seed due to lack of incentives it is necessary for the public sector to intervene in the production of seed. However, to reach remote areas and to further overcome poverty and un-affordability constraints community seed production models such as the Seed Bank model practiced in Malawi is appropriate.

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