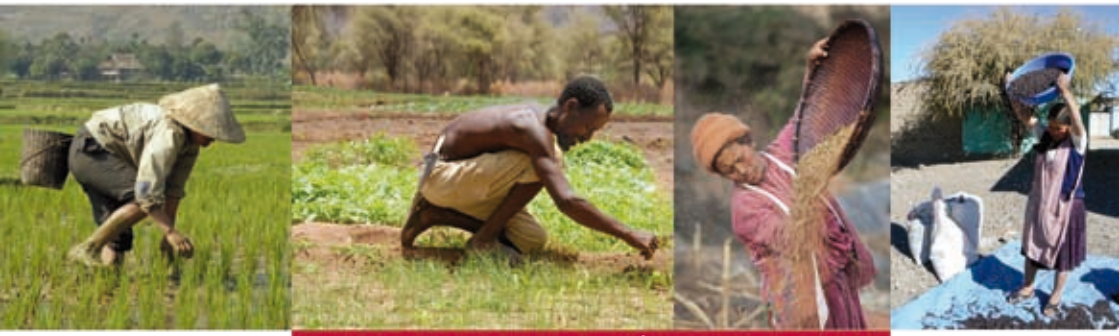
Promoting the Growth and Development of Smallholder Seed Enterprises for Food Security Crops



Best practices and options for decision making

Promoting the Growth and Development of Smallholder Seed Enterprises for Food Security Crops

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Paul J.H. Neate
Science writer

Robert G. Guei
Agricultural officer seed production and processing
Plant production and protection division

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Foreword

In recent years, many governments in the developing world curtailed public-sector investment in the seed sector, hoping that the private sector would take over. However, the private sector has generally not taken up the challenge as expected. As a result, farmers are left without access to seeds of new and improved varieties. This is especially critical for self-pollinated and open-pollinated crops and vegetatively propagated crops that are not attractive to private investment.

This is a major problem constraining agricultural development, particularly in the face of climate change when access to new and genetically diverse varieties is critical. Countries often request the Food and Agriculture Organization of the United Nations (FAO) for policy or technical advice on how to sustainably increase the supply of quality seeds of crops, which is so important to food security.

The present Guide is in response to the request by governments and decision-makers in developing countries for guidelines on options to build efficient seed delivery systems adapted to the level of their agricultural development. Though it is not and should not be considered as a panacea to all seed issues facing different countries, FAO hopes that it will help to better understand the problems in this sector in order to better cope with them and will therefore contribute to the development of vibrant national seed industries in developing countries in support of food security.

Shivaji Pandey
Director, Plant production and Protection Division
Food and Agriculture Organization of the United Nations

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1. Introduction

1. Introduction

Farmers everywhere depend on access to good quality seed as the foundation to their crop production system. At the same time, easy access to quality seed can be achieved and guaranteed only if there is a viable seed supply system to multiply and distribute seeds that have been produced or preserved.

Over 90 percent of the crops in developing countries are still planted with farmers' varieties and farm-saved seeds. Private seed companies tend to concentrate on production of hybrid seed, especially of high-value crops grown by larger farmers in more favourable areas, i.e. targeting those who are best able to pay for the seed. They tend to avoid self-pollinating crops, including many of those grown by smallholder farmers and on which they depend for their food security. Also for these crops, opportunities for commercial seed production are very limited because the biology makes it easy for farmers to save their own seeds for planting.

In the past, the public sector, universities, governmental organizations and international research organizations, was the major source of new varieties and quality seeds of food crops for the smallholder farming sector, especially self-pollinating crops. However, in recent years many countries, donors and international organizations have encouraged privatization of the seed sector. This, combined with cut-backs in international agricultural research organizations, has led to reduced investment in public-sector plant breeding and seed production. This has very seriously constrained progress towards food security in many developing countries.

In view of the little interest of medium to large seed companies, the most effective alternative is to create effective and efficient smallholder seed enterprises with lower capital investment needs and reduced overheads. These enterprises, often made up of farmer organizations, are often close to smallholder farmers and located in farming communities, and should be able to distribute quality seeds of improved and local varieties of major food security crops effectively and efficiently. They are vital in linking the formal and informal seed sectors.

This Guide is based on the accumulated experience of the Food and Agriculture Organization of the United Nations (FAO in the seed sector) and lays out the necessary conditions and key requirements for the development of such smallholder seed enterprises in developing countries and how such processes can be supported. It also describes the necessary capacity development aspects involved in the establishment of smallholder seed enterprises (Table 3).

2. Tailoring policies to seed industry's developmental stages

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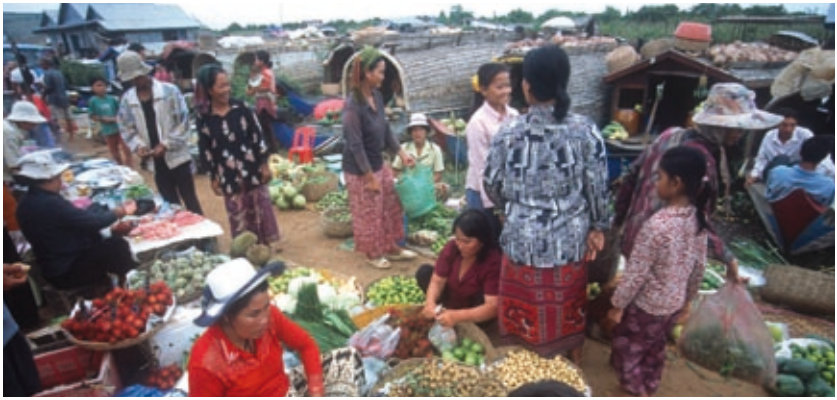

Stages of development of the seed sector

The stage of development of the seed sector as described by many authors (Pray and Ramaswami, 1991; Morris, ***et al.***, 1998; Maredia, ***et al.***, 1999; Tripp, 2003; Kosarek, ***et al.***, 1999) is a primary consideration for any planned interventions. The following section describes each stage of the evolution of the seed sector and the possible interventions which may be needed. Basically, there is a general transition from a strong public sector which takes the lead in seed production and control to a situation whereby the private sector in the form of local smallholders takes over these roles. National policies and legislation need to support the transition by encouraging linkages between research, extension, quality control and smallholders and by building systems of credit, tax breaks and/or subsidies as required. Tables 1 and 2 provide an overview of major characteristics and **main policy support priority activities** at each stage.

Table 1: The stages of development of the seed sector and their main characteristics

Stage	Main Characteristics
Pre-industrial	Subsistence agriculture, traditional varieties or landraces grown from farm- saved seed or seed obtained through exchange with other farmers.
	Varietal improvement is in the hands of farmers.
	No formal varietal registration or quality control standards.
	No seed legislation, seed policies or intellectual property laws applying to seed.
Emergence	Farming is still primarily subsistence, but surpluses may be sold on fledgling markets.
	Some farmers adopt improved self- and open-pollinated varieties, fewer still experiment with hybrids.
	Public sector organizations begin plant breeding and producing seed. Most seed is still farm-saved, but increasing numbers of farmers buy commercial seeds.
	Public extension services play a key role in informing farmers of characteristics and benefits of new varieties and connecting farmers to sources of seed.
	Legal framework for control of seed industry begins to take shape, often by adopting standards from more developed countries and international organizations.
	Need for Intellectual Property Rights is still weak, as primary source of seed is still in the hands of the public sector.
Expansion	Increasingly commercial crop production, with more of the crop sold rather than for home consumption.
	Many farmers have adopted hybrid seeds of major crops, with very little farm-saved seed of these crops.

Stage	Main Characteristics
Expansion	Open-pollinated varieties (OPVs) still dominate less commercial crops and 'orphan' crops, and farm-saved seed continues to dominate for these varieties.
	Private sector becomes involved in plant breeding and seed production, and increasingly involved in providing technical information and 'extension'.
	Quality control strengthens, but plant variety protection is still weak
Maturity	Agriculture is largely commercial, with hybrids dominating in high-value crops.
	Most farmers purchase seed annually.
	Plant breeding increasingly in the private sector, although low-value, high-volume OPVs are still largely the domain of public sector breeding and small- to medium-scale seed enterprises.
	Seed production is entirely in the private sector, and the private sector is increasingly the source of technical information for farmers.
	Quality control standards are strongly enforced, and plant variety protection is in place and effectively implemented.

Table 2: Adaptation of policy support to the respective stages of development of the seed sector

Stage	Best practices
Pre-industrial	Raise awareness of improved agricultural practices, and the importance of improved cultivars and the quality of seeds.
	Support the production and supply of quality seed by promoting the best landraces or improved varieties available from elsewhere that is suited to local agroclimatic conditions.
	Link farmer seed producers with sources of seed of improved varieties.
	Make seed available through extension agents and key farmers, and support appropriate systems for marketing farmer-produced seed.
	Develop farmers' participatory evaluation of cultivars and landraces, and invest in collecting and characterizing traditional landraces and potentially suitable modern cultivars, and in training in all aspects of seed production, health and storage.
	Develop a national seed policy, seed plan and flexible seed legislation to provide the framework of institutional mechanisms for seed production, quality control and trade.
	Develop policies based on own circumstances and interests, and avoid importing non-adapted policies from mature seed industries.
Emergence	Focus is on strengthening the foundations established during the pre-industrial phase.
	Promote demand for improved seed including multilocational variety testing and demonstration trials.
	Strengthen extension services to ensure that farmers are aware of new varieties and their characteristics.
	Establish public-sector seed production, certification and quality-control agencies and seed-testing laboratories to provide the foundations of the fledgling seed sector.

Stage	Best practices
Emergence	Support low rate credit schemes to establish seed-processing and quality-control facilities, to facilitate the establishment of small-scale seed enterprises.
	Support agricultural universities and public-sector research centres for plant breeding, seed research and business management for seed enterprises.
	Strengthen informal seed systems through village seed banks
	Train in seed production, quality control and seed certification.
	The policy environment should be supportive of the smallholder seed producers and the informal seed sector.
	Plant breeders' rights may need to be introduced as a foundation for private-sector involvement in the seed sector, but policy should provide for 'farmers' privilege'.
Expansion	Continue to build demand for seed, and to provide a policy environment that encourages private-sector involvement in seed production and marketing.
	Public sector may reduce its direct involvement in such activities as seed production, quality control and certification and seed supply systems, allowing these to be taken up by the private sector, albeit with continued public-sector oversight.
	Public sector will still be the primary locus for breeding and improvement of open- and self-pollinated crops.
	Support infrastructure development for seed production (processing and storage), distribution (transport network) and marketing.
	Policy should aim to ensure availability of low rate credit both to seed enterprises (and contract growers) and to farmers to purchase seed.
Maturity	Provide a policy environment that encourages a balance of public and private investments in the seed sector.
	IPRs will need to be provided to stimulate private-sector investment in plant breeding and extension activity.

Stage	Best practices
Maturity	Continued need for public-sector involvement in low-value open- or self-pollinated crops which do not offer adequate returns for private sector investment.
	Seed certification and variety registration policies can be more strictly applied at this stage, with many associated activities privatized, albeit with standards set and monitored by government agencies.
	Government should continue its investment in fundamental research and education, but training in technical skills in seed production and processing can increasingly be taken on by the private sector.

3. What are some of the key requirements for successful smallholder seed enterprise development?

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Most developing countries' seed sectors fall in the aforementioned first two stages (pre-industrial and emergence). These two stages are mainly characterized by subsistence farming and the adoption of improved self- and open-pollinated varieties. The public sector organizations begin with plant breeding and producing seed. Although most seeds are still farm-saved, increasing numbers of farmers buy commercial seeds of their food crops from nascent smallholder seed enterprises. Therefore, their development and efficiency should be of utmost importance to governments as they better handle self- and open-pollinated crop seed not profitable enough to larger companies.

Many factors influence the development of effective smallholder seed enterprises. The following are some of the specific key requirements for their establishment and sustainable operation.

Conducive policy environment

Comprehensive national seed policies are crucial to the development of seed enterprises of any scale. Key elements of a national seed policy include:

- plant improvement and variety development; variety evaluation, registration and release; national seed production and commercialization plan; seed production including early generation seeds;
- quality control and certification, storage and marketing; farm and community seed production;
- promotion of production and marketing of high-quality seed;
- plant variety rights; flexible seed legislation; and incentives, including taxes and credit.

Overall, the policy environment must be supportive of the nature and scale of seed enterprise envisaged. This includes the recognition of farmers' privilege (the right to save, exchange and sell seed even of commercial varieties) for farmer-based seed enterprises, the support for privatization and commercialization of agricultural services, and also the recognition of the plant breeders' rights.

There is an argument for limiting emphasis on formal regulation in early stages of development of the seed sector. It is thought that policy should instead allocate more resources to increase the quality-control capacities of seed producers and thereby helping farmers to recognize the varieties that best meet their needs and appreciate the value of quality seed.

Existence of sustained demand for quality seed

The first issue for development of seed enterprises is whether there is a demand that will ensure the long-term commercial survival of the enterprise. The existence of sustained demand is widely recognized as a success factor while the weakness of demand for seed is known to constrain development of seed enterprises.

Development of markets for smallholders' produce is possibly the single most effective measure to stimulate development of seed enterprises. However, major efforts are still required to raise the awareness of farmers of the benefits of using high-quality seed. Lack of information and poor extension services are known to constrain uptake of improved varieties in developing countries. Governments may need to provide incentives to encourage development of seed marketing channels in less-favourable areas.

Where the seed sector is at the 'pre-industrial' stage of development, a better approach may be to strengthen local seed systems, particularly through promoting new varieties, linking farmer seed producers with sources of seed of improved varieties, making seed available through extension agents and key farmers, and supporting appropriate systems for marketing farmer-produced seed. This will stimulate uptake of improved varieties and provide the foundation for future demand.

Availability of improved varieties and source seed

Availability of improved varieties from public sector breeding programmes is one of the key success factors for the growth of smallholder seed enterprises in many countries. It is common for small- and medium-scale enterprises to depend on the public sector, government institutes and universities, for new varieties and even source seed (breeder and foundation seeds), and continuing public sector

investment in these activities is required for self-pollinated, open-pollinated and vegetatively propagated crops.

An efficient system of distributing source seed is also essential, those interested in commercializing varieties must have easy access to sufficient quantities of source seed. However, public-sector seed production and distribution are often expensive and ineffective, and government should provide incentives to stimulate the involvement of the private-sector.

Increasingly, participatory breeding and on-farm testing programmes are being recommended for generating new varieties of low-value crops and enhancing their adoption by smallholder farmers. These activities need to be developed in public-sector breeding and extension programmes together with proper linkages to smallholder seed production systems to ensure success and availability of new seeds.

Entrepreneurship, technical skills and capacity

Developing a national seed sector will require that capacities are in place at individual, institutional and policy enabling environment levels. For various actors, producing quality seed requires a range of skills and capacities at various levels, from planning and management of seed production to skilled farm operations. This requires cadres of skilled and knowledgeable people at all levels of the seed 'chain', and therefore training at all levels, from farmers to scientists and policy-makers (Table 3). Technical support for seed production from extension services is essential during early stages of development of seed enterprises. Improving farmers' skills and knowledge in seed storage, seed quality management, marketing, accounting and accessing new varieties could enhance uptake and spread of new varieties and improved practices. It will keep the smallholder seed enterprise commercially viable.

Table 3: Overview of the capacity development dimensions in the seed sector

Dimension	Key Actors	Primary capacities which need strengthening
Individual	Farmers, technical staff in seed enterprises, technical staff in research institutes and national seed services of the ministries	Technical capacities regarding seed production, conditioning, quality control and certification
Institutions	Seed enterprises, farmer organizations, research institutes, seed services	Technical capacities regarding seed production and conditioning
		Planning and management
		Business skills; accounting
		Best practices on seed distribution
		Best practices on subsidies and credit
		Knowledge-sharing between research, extension and farmers
Policy enabling environment	Ministries	How to better develop and implement policies and legislation on: ■ variety release and seed production and commercialization; ■ seed quality control, quality testing and certification; ■ financing and incentives; ■ plant variety protection.

Access to low interest rate credit

Access to low interest rate credit is vital to the development of seed enterprises, especially small-scale enterprises. Low interest-rate credit is crucial for purchase of inputs, field equipment and seed-handling equipment. Dealers also need access to credit to finance purchase of new and improved seeds until they have generated sufficient profits to finance their own operations. Availability of credit, particularly at government-subsidized interest rates, is considered to be a key success factor, while the lack of credit is a key constraint to a successful seed enterprise development.

Enterprise ownership and profitability

Seed enterprises must be based on local ownership and profitability (in monetary terms or other socio-economic determinants) to ensure their sustainable development and growth. Many small-seed enterprises have been developed with external support, either from donor agencies or from non-governmental organizations (NGOs). While these have proved successful in delivering improved seeds to subsistence farmers and those in remote areas, this approach is not always sustainable and very often lead to continuous dependency on aid.

Infrastructure

Costs of infrastructure, particularly processing and storage facilities, can be a major constraint, although in some countries, policies are in place to subsidize such costs. Governments should consider providing subsidies or other related support and services for establishing seed enterprise infrastructure, especially in early stages of development of the seed sector.

Linkages between formal and informal seed sectors

Functional linkages between the formal and informal seed sectors enhance efficiency in the operation of both sectors and promote evolution of the seed sector in general. The formal seed sector is the primary source of new crop varieties, and is home to most of the capacity in 'scientific' plant breeding, extension services and credit. The informal sector is the primary link to farmers' and traditional knowledge, especially requirements for new varieties, inputs and services. Strong smallholder seed enterprises can play a key role in linking the two sectors if they have continuous access to improved varieties from public crop breeding programmes.

Communications Strategy, branding and marketing

An effective communications strategy is essential for smallholder seed enterprises to thrive in a competitive world and to ensure a sustained market for their produces. A coherent strategy which, for example, announces new variety registration together with a branding of that variety, should be at the centre of the operation of the smallholder seed enterprise. Mass communication strategies, including the use of rural radios, may be utilized depending on the specific country, but information should be packaged around improved seeds, in such a way as to generate transparency and trust in the sector and create enough space for innovation and creativity for all actors.

4. Conclusion

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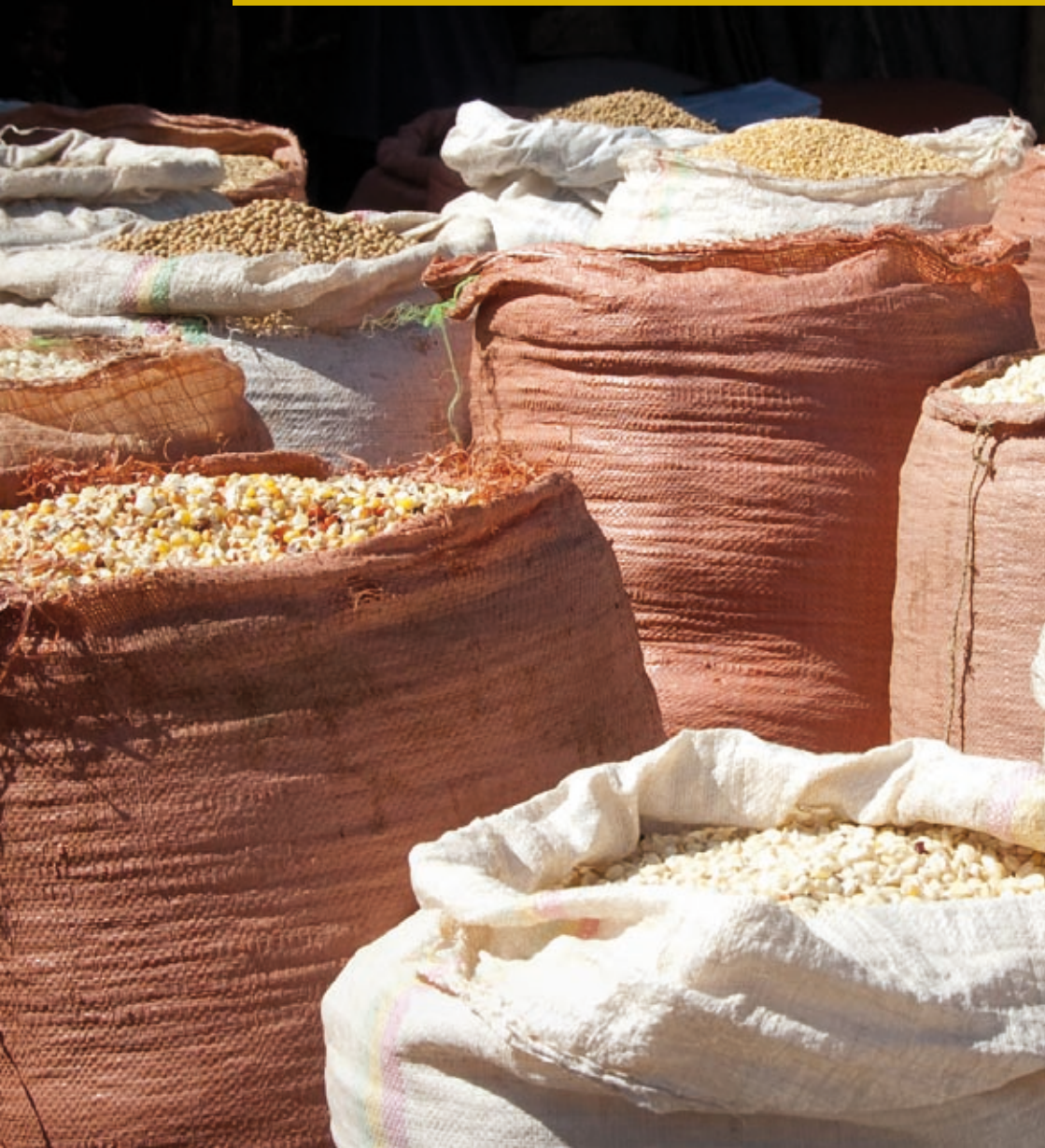
Farmers everywhere need easy access to high-quality seed of well-adapted, productive crops to allow them to produce the best possible crops. But efforts to encourage the private sector to play a role in ensuring efficient production and distribution of seed in the developing world have yielded mixed results. The problems are complex as they combine both the reproductive mode of the major food security crops (mostly self-pollinated, open-pollinated and vegetatively propagated crops), and the stage of agricultural development of the country.

This Policy Guide shows clearly that the best approach to ensuring production and distribution of quality seed in developing countries may be to support smallholder seed enterprises with lower capital investment needs and less overhead costs. However, the fact still remains that these smallholder enterprises can only prosper if the policy environment is conducive and if the needed capacities are in place.

5. References



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Agriculture is the mainstay of the economies of developing countries and the source of livelihood for the majority of their populations. In view of this, it is considered crucial that the performance of agriculture should ensure food security and provide a strong economic base.

Towards this aim, improved seeds have been widely recognized as a key ingredient for enhancing farm productivity and overall crop production and thereby attaining the goal of food security.

However, medium to large private companies, so far, do not effectively produce and distribute seeds of most major non-hybrid food security crops in developing countries. Case studies undertaken in Africa, Asia and Latin America indicate that smallholder seed enterprises could provide a valid alternative if supported.

This publication aims at raising the awareness of decision makers and provides guidelines of best practices and policy options for promoting and supporting the growth and development of smallholder seed enterprises.