

Seed System Institutionalization for Pulses: A Must in the Philippines¹

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Abstract

The Green Revolution (GR) program has influenced seed system in the 70's in vegetables and cereals but not in pulses. Seed is the fundamental life-blood of agriculture and the foundation of a successful farming for smallholder farmers in the dryland tropics. The farmer does make arrangements for many farm inputs but the seed is the primary input. Good quality seeds, which have genetic and physical purity; health standards; high germination and moisture percentage, can increase farmer's production by about 20-30%. The procedures, through which a cultivar is bred, produced, certified, stored, marketed and used which includes all the channels through which farmers acquire genetic materials and in interaction with the commercial seed industry is known as seed system. In the Philippines, the flow of planting materials is more on the farming community as farmer seed exchanges and barter is preferred than acquiring seeds by cash. Most often the cultivars promoted are the registered seeds or good seeds, limiting the diversity in farmers' fields. Farmers have traditionally relied on seed saving as their primary method of seed access. For pigeonpea, farmers cultivate local varieties and would trade seed amongst themselves or between villages when their seed became unviable after 2-4 years or more of successive cultivation. The trade between farmers first and then with neighboring villages helped to give new exposure to existing cultivars in the village.

1.0 Introduction

Seeds is the lifeblood and foundation of a successful farming and a crucial element in the lives of agricultural communities (Mula et al 2013). Though seed plays a significant role in crop productivity, its availability often affects farmer's ability to sow the crop timely (Cromwell 1996). The farmer prepares for all the inputs, one of which is the seed that is the most critical. Quality seeds are those which have genetic purity, physical purity, health standards, germination and moisture percentage. With these, the farmer can increase his production by 20% (Mula, 2012). If the seed is of bad or low quality, then all the investments of the farmer such as labor and other inputs turn to waste.

Seed systems include various institutions that are involved in production (i.e. collection and breeding), multiplication, processing and marketing of seeds. Strong policy advocacy at the national level plays an important role in research, crop improvement and varietal release, seed production and certification, procurement and sale/distribution. Development of a strong seed sector requires a coordinated effort of both public and private sectors with different but complementary and well-defined roles and activities (variety development, seed production and marketing). The degree of involvement of either public or private sector depends on the advancement of seed system in the region/country. Since large quantity of seeds comes from the informal sector (Setimela et al 2004; Buruchara et al. 2011), there is now greater interest in understanding and learning from it, including attempts to combine the strengths of the formal and informal seed sectors.

In the Philippines, the green revolution program in the 70's concentrated on cereals seed supply chain thus reasonable quantities of these legumes are imported to meet domestic requirements. Legume production has been marginalised by undue importance given for staple cereal production and that is acting as a deterrent for farmers to make investment in improved legume technologies (Byerlee and White 2000). Diversity of legumes coupled with strong consumer preferences for specific quality traits (like high grain

¹ A paper presented during the '1st Philippine Pigeonpea Congress', 16-18 December 2014, Mariano Marcos State University (MMSU), Batac, Ilocos Norte, Philippines

protein content) complicate the crop breeding and seed delivery processes. Relatively limited importance is accorded to legume seed supply system compared to cereals (Aw-Hassan et al 2003). Thus, quality seed of improved varieties is not adequately available to the farmers where most farmers in these regions are either smallholder or marginal.

Awareness on the importance of a stable seed supply system in farming communities need to be increased. Farmers' role in the seed supply system need to be strengthened, as they are the key players in agricultural production, especially in widening and maintaining genetic diversity in their own fields as they become involved not just in seed exchange but also in the improvement and use of their seeds. A cost-effective system of seed production and distribution is required to ensure that seed is available to farmers timely and at reasonable price. Likewise, the system of free access and exchange should be strengthened to give the farmers full rein in the local seed supply system.

2.0 Seed Delivery System in the Philippines

Seed system in the Philippines consists of the informal, formal and the integrated seed sector. The **informal seed sector** dominates the seed production system. Approximately 80–90% of all planting material used is largely sourced from farmers' own-saved seed or the informal seed sector which involves saving seed from own harvest, and using seed for re-sowing, sharing, exchanging, bartering and selling. Although, the private sector is increasing its share of the market, it is the farmers sector (farmer-saved seed and exchange systems), which produces 70% of the quality seed. Farmers save seed of local varieties that are used continuously for about 2-4 years or more (Figure 1) with low seed replacement ratio of 2-3%. In addition, the proportion of quality seed available is less than 12% of the total seed used for sowing each year (Ravinder Reddy et al., 2007). The varieties used are often local landraces because of inadequate awareness about improved varieties and seed availability including access.

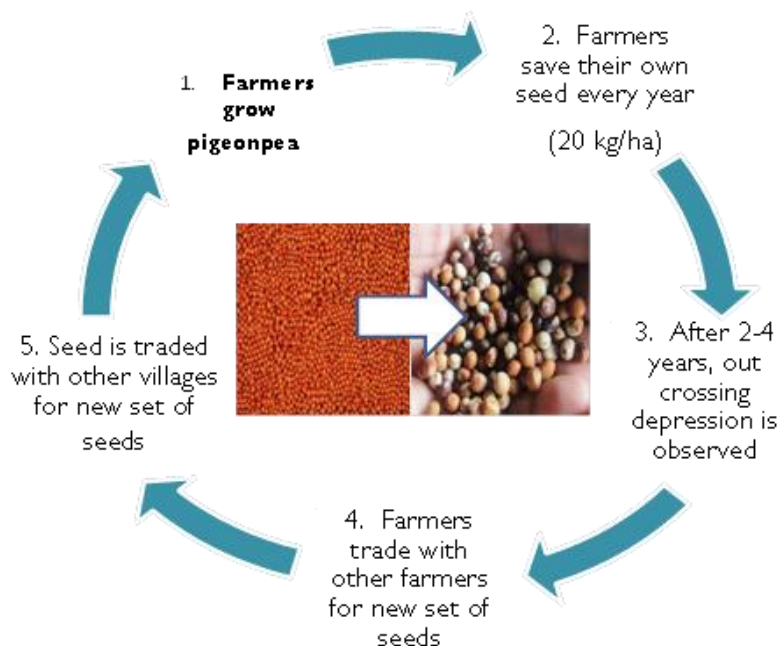


Figure 1. Existing pigeonpea smallholder farmers seed system model

Seed is procured off-farm only when necessary just like when own seeds is not available due to drought, poverty or seed pests/diseases. The main sources of off-farm seeds are local markets, relatives, other farmers and government relief agencies. However, the statement about the predominance of the informal sector depends upon the type of crops, villages, farmer groups and their socioeconomic conditions. Traditional seed systems are location-specific and vary greatly within farmer communities.

In the **formal seed sector**, private companies respond to commercial incentives on hybrids of high-value seeds. However, the existence of developed formal seed sector at the national level cannot guarantee small-farmer seed security at the community and household levels.

The **integrated seed system** is an approach that has elements of both the formal and informal seed sector in breeding, seed production and distribution. This has shown to have promising potential for improving seed supply to smallholder farmers.

However, any seed system, for that matter, requires a regulatory framework as well as a seed policy that considers regulations of an expanding (including diversification) seed sector for the benefit of the farmers engaged in seed production system. However, the following constraints have to be addressed in order to have an effective seed delivery system: Limited access to seed of new farmers' preferred varieties; Missing or poorly functional national variety release committee; Rigid government policies and regulations hampers the development of informal seed systems; Lack of integration between input and product markets; Lack of enabling policies and other institutional interventions; Lack of interest from commercial seed companies to multiply seeds due to low profit margins; and Difficulty in maintaining genetic purity of foundation and certified seeds due to its open pollinated nature.

3.0 Dynamics of Seed Production in the Philippines

The seed production process consists of a sequence of stages in which seed of a new variety is multiplied to obtain sufficient quantities of commercial seed. Source seed production in many national seed systems is beset by several constraints. The seed programme largely adheres to a limited generations' system for seed multiplication in a phased manner. The system recognizes four types of seed namely nucleus, breeder, foundation and certified seeds that provides adequate safeguards for quality assurance in the seed multiplication chain to maintain the purity of the variety as it flows from the breeder to the farmer. However, in most cases, progressive seed growers produce and sell farmers preferred varieties (FPVs) classified as 'Registered' and/or 'Good' seeds but not certified.

Formal seed supply system consists of seed production conducted by agencies like (a) State government agencies; (b) Government-assisted and other cooperatives; (c) Multinational corporations (MNCs) or transnational corporations (TNCs); (d) Domestic private sector companies with their own research and development (R&D) or without their own R&D agenda; and (e) Joint venture companies between MNC and domestic private company or between two domestic companies, etc.

The formal seed sector, through its involvement in variety development characterized by planned production, evaluation and release, offers only a limited range of varieties and operates within specified quality standards. This poses a constraint in meeting the diverse needs of farmers. In response to this situation, smallholder farmers must participate in seed production activities in which they have a competitive advantage. This would require access to well-organized marketing, distribution and post-harvest systems; effective market information; and technologies that provide the farmers higher price and of seeds that are of competitive quality.

To sustain the production of quality seeds in pigeonpea (*kadyos*), partners need to concert their efforts by specifically defining their roles in the seed production program of the said crops. Table 1 presents the different types of seeds that need to be produced and who among the partners should be responsible. This is critical in order to ensure the quality of seeds that determines a functional seed system.

Table 1. Responsibility of partners in the seed production program

Type of seed produced	Responsible institute
Nucleus and Breeder seeds	ICRISAT, SCUs, IPB
Breeder and Foundation seeds	SCUs, Research Outreach Stations (DA), Institute of Plant Breeding, BPI
Certified, Registered and Good seeds	Registered farmer seed growers

4.0 Strategies for an Effective and Efficient Seed System in the Philippines

4.1 Farmer Participatory Seed Production. In order for this strategy to be effective and functional, the following must be improved: develop strategies to produce, test, & market; back up institutional support & crop insurance; agreements between farmers & seed agencies; help farmers in adoption of new technology; develop specific models based on geographic and ethnic considerations; implement self-reliance seed programs to decentralize seed business; identify and promote farmer preferred cultivars; encourage seed companies to involve in pulses; encourage Corporate Houses to support pulses seed programs; strengthen capacity of cooperatives; incentives to participating farmers; and develop a quality seed backup program.

- **'One Variety One Barangay' Model** where seeds are made available at the local level through which quality seeds of farmer preferred varieties (FPVs) of pigeonpea and sorghum are produced by progressive farmers, farmers cooperatives and even NGOs (Figure 2). This model will prohibit outcrossing in order to maintain the purity, yield and disease resistance of cultivars. This is very important in the case of pigeonpea.

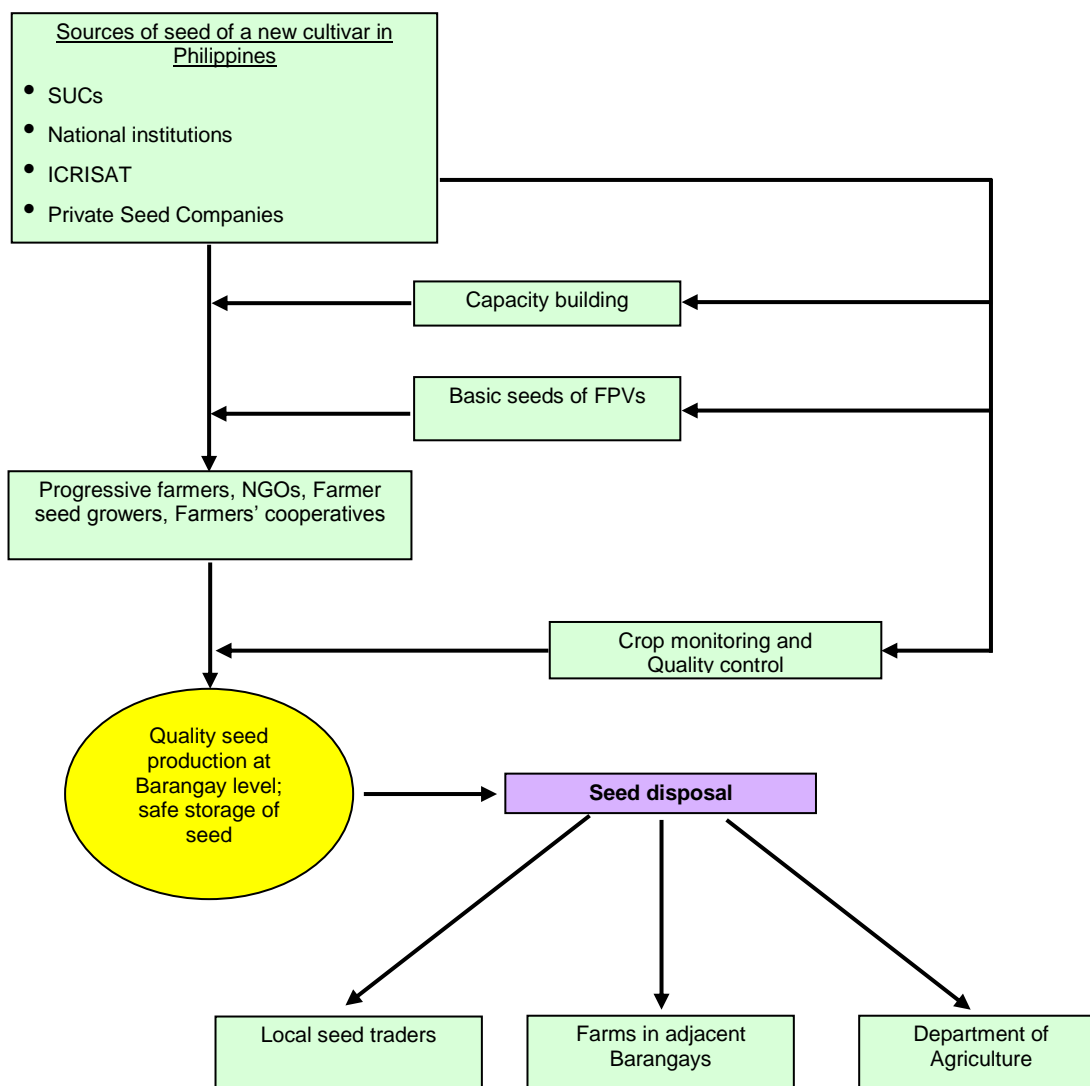


Figure 2. 'One Variety One Barangay' seed production system model.

4.2 Integrated Seed Supply System combine the methods of both the formal and informal sectors. This model will give an opportunity for farmers to be involved in variety use and development; seed production and storage; and seed exchange mechanisms under local conditions (Figure 3).

Research and Development

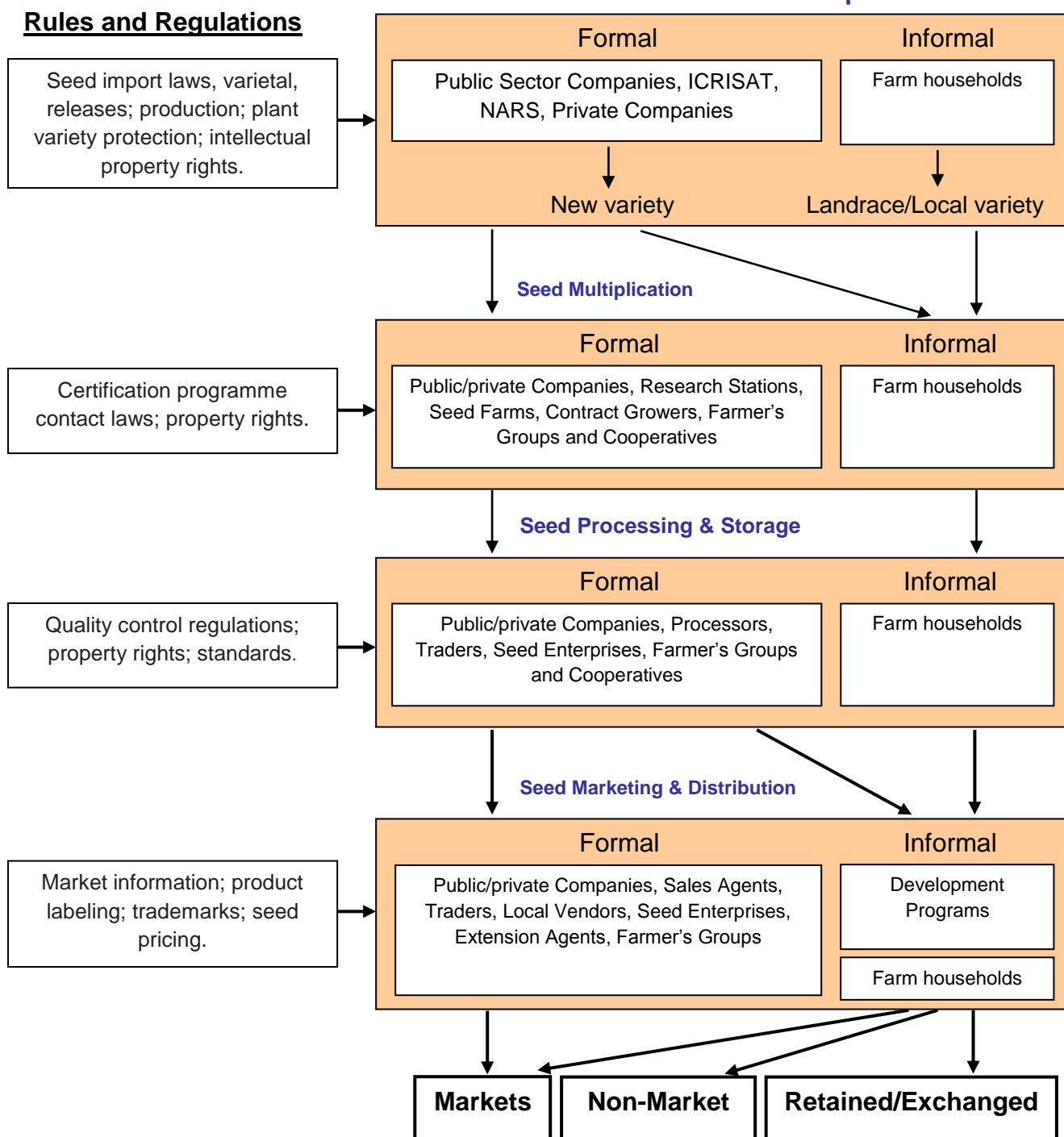


Figure 3. Integrated seed system organizational and institutional schema.

5.0 Way Forward for a Sustainable Pigeonpea Seed System

The following issues need to be addressed for strengthening the seed production, multiplication and delivery systems in the Philippines:

- Sensitization of policy makers about the importance of legumes in agricultural production systems will aid in getting their support in seed production and delivery systems.
- Establishing a seed road map to ensure sustainability and upscaling of pigeonpea.
- Sustainable seed production and delivery by smallholder farmers will succeed if complimented by assured markets (functional seed and product markets) through the establishment of linkages

between farmer groups and traders, agro-dealers, companies and others dealing with markets and the distribution.

- 'Community Seed Producer Associations' should be promoted or enhanced, and provided accessibility to seed processing, storage facilities and marketing.
- Formal seed certification should be implemented to maintain the seed quality for seed grower, farmers and farmers' groups and associations.
- Larger networks and forging partnerships at different levels will finally help in better production, processing and marketing of the product.
- Strict implementation of seed laws is necessary for effective seed delivery system.
- In addition to yield, resistance to biotic and abiotic stresses, maturity duration, and market-preferred traits are also important for adoption and scaling out of improved varieties.
- Capacity building measures (trainings/workshops) and participatory varietal selection, field days and seed fairs are very effective in creating awareness among farmers about new varieties and improved technologies.
- Farmer's participatory varietal selection trials (FPVST) reduces the varietal testing time and increases the adoption rate of improved varieties.
- For project completion, Interventions should focus mostly on smallholder farmer-based seed production and delivery systems that have a better chance of survival

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