

Role of Seed in Transforming of Agriculture in Myanmar

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INTRODUCTION

Agriculture, including fisheries and forestry, accounted for 36.4 percent of Myanmar's GDP in 2010-2011. Approximately 69 percent of the total population of 59.78 million (2010-2011) lives in rural areas and 61.2 percent of the total labor force is employed by the agriculture sector (MOAI 2012). The government has designated the agriculture sector as a main pillar of the economy and is dedicating various efforts and investments to achieve greater progress in the sector. Rice is the primary crop, followed by maize, pulses, and oil seeds. Over 90 percent of the total rice sown in Myanmar¹ is done so by farmers' reusing their seeds. Hybrid varieties of maize are grown more widely in part due to domestic hybrid production and imports. In recent years, there has also been an increase in the production of fruits and vegetables due to demand from China as well as the emergence of supermarkets in the country which has also increased the utilization of quality seeds and seedlings.

POLICY LANDSCAPE

The Seed Law stipulates the rules governing seed breeding, registration, production, and quality control and was enacted in January 2011. The Seed Law encourages the participation of private sector and non-government organizations in the development and production of seed as well as sets goals for cooperation with international organizations, such as the International Rice Research Institute (IRRI). The implementation framework of the Seed Law has been drafted, but is still under the approval process despite the two year grace period between the time of the law passing and its recent enactment. Registration and certification processes are therefore not fully functional at present.

There are several other laws that impact the seed sector that have recently been drafted or enacted in Myanmar. The Plant Pest Quarantine law and regulation was enacted in 1993 to prevent the movement of pests and diseases from imported seed and seedlings. The recently developed Farm Land Law allows farmers greater control over land use rights and decision making. Farmers can now engage in the seed market through the production of seed by contract farming, starting businesses, or renting land to other businesses.

Table 1—Legislations related to development of seed industry

| Title of Law | Scope of Law | Responsible Agency | Status |
|-------------------------------|---|--------------------|-----------------|
| Plant Pest Quarantine Law | Prevent pests from entering the country | DOA, MOAI | Enacted in 1993 |
| The Seed Law | To produce crop with quality seed and to carry out seed business systematically | DOA, MOAI | Enacted in 2011 |
| Farm Land Law | Liberalization of land usage rights | SLRD, MOAI | Enacted in 2012 |
| Law on Bio Safety | To manage safety of seeds and plant parts | MOAI | Drafted |
| Plant Varietal Protection Law | To protect breeder's rights | DAR, MOAI | Drafted |

Source: Department of Agriculture (DOA)

The protection of new plant varieties as a form of intellectual property is an important stimulus to private investment in plant breeding and is requisite to convince multinational seed companies to introduce their varieties to the market. In Myanmar the Plant Varietal Protection Law has only recently been drafted in accordance with obligations under the Trade Related Aspects of Intellectual

¹ Distribution of certified seed by DoA covers only less than 10 percent of seed requirement for rice. Based on that, it is estimated that 90 percent of rice sown area is covered by farmers' own seed.

Property Rights (TRIPs) and is under the process of national approval. In addition, Myanmar has been party to the Convention on Biological Diversity since 1994 and became a member of WTO in 1995. Myanmar is still not a member of International Union for the Protection of New Varieties of Plants (UPOV) which provides and promotes plant variety protection with the aim of encouraging the development of new varieties of plants. However, since 2004, Myanmar has participated in the UPOV-INGER² workshops and continues to cooperate and seek advice on the development of national seed regulations.

KEY PLAYERS

The National Seed Committee (NSC) was established in 2004 and is the body responsible for seed quality assurance and the supply of seeds and planting materials to farmers throughout the country. It is chaired by the Deputy Minister of Agriculture and Irrigation (MOAI) and is comprised of representatives from relevant government departments, experts, and representatives from organizations. The Director General of the Department of Agriculture (DoA) acts as secretary. Any person who desires to establish a seed testing laboratory must apply to the NSC to obtain a registration certificate.

The roles and responsibilities for seed research, production, and distribution have undergone changes in the last decade. Until 2000, DOA was responsible for multiplication, procurement, storage, and distribution of seed. The Agricultural Extension Division of DoA multiplied certified seed through contracting farming arrangements, provided support for rouging to manage seed purity and oversaw other quality control processes. The Procurement Division of DoA purchased the certified seeds produced by contract farmers and stored the seeds prior to distribution.

In 2000, the Department of Agricultural Research (DAR) under the MOAI took over responsibilities for testing new varieties in research stations in order to confirm the potential yield, quality, genetic stability, local adaptability, and pest and disease resistance. The DAR is also responsible for the production of breeder and foundation seed and the Seed Division of the DoA uses these pure seed lines to produce both foundation and registered seed. The Seed Division of DOA is also responsible for seed certification but there are still no specific procedures established under the Seed Law to govern its implementation. The Seed Division also lacks manpower and facilities to undertake field inspection and laboratory testing.

DAR has a total of 450 technical people including 20 Ph.D and 60 M.Sc. and has 24 research stations. Over a 40 year period DAR has developed 211 crop varieties including 99 rice varieties. DAR has also maintained 12,000 samples of local landraces and wild rice relatives in a long-term genetic seed bank. This collection is actively used in local breeding programs and exchange programs with other bilateral and international research institutes.

SEED PRODUCTION

Prior to 1977, farmers grew mostly indigenous crop varieties with seeds that were locally available through exchange while small amounts of quality seed was produced by research farms under the Applied Research Division and distributed to contract farmers through extension staff. Agriculture grew at a modest rate of 1.6 percent per annum during the 1960s and early 1970s, but was below the population growth rate of 2.2 percent which resulted in decreased rice surpluses (FAO, 1986).

In an effort to boost yields the Government launched the Whole Township Paddy Production Program in 1977-1978 initiating the large-scale introduction of improved technologies including HYVs adapted from the International Rice Research Institute (IRRI-8 and IRRI-5), proper tillage, chemical fertilizers, pesticides and modern cultivation practices covering a total of 2.5 million ha. As a result, paddy area covered by HYV increased from 4 percent in 1970-71 to nearly 50 percent ten years later, resulting in a near doubling of production during this time. The breadth of the program increased demand for a steady supply of quality seeds, leading to intensified research.

In 1992 the Ministry of Agriculture and Irrigation launched a second program to increase summer paddy production built on short duration, high-yielding varieties of paddy. As a result total paddy production increased by 4.98 million MT in a single year and boosted exports to 1 million MT, the largest amount in the 30 years prior. However, since this time, most increases in rice production have been a result of harvested area expansion rather than productivity growth due to increased HYV usage (Table 2).

² International Network for the Genetic Improvement of Rice

Figure 1—Summer paddy area and total production

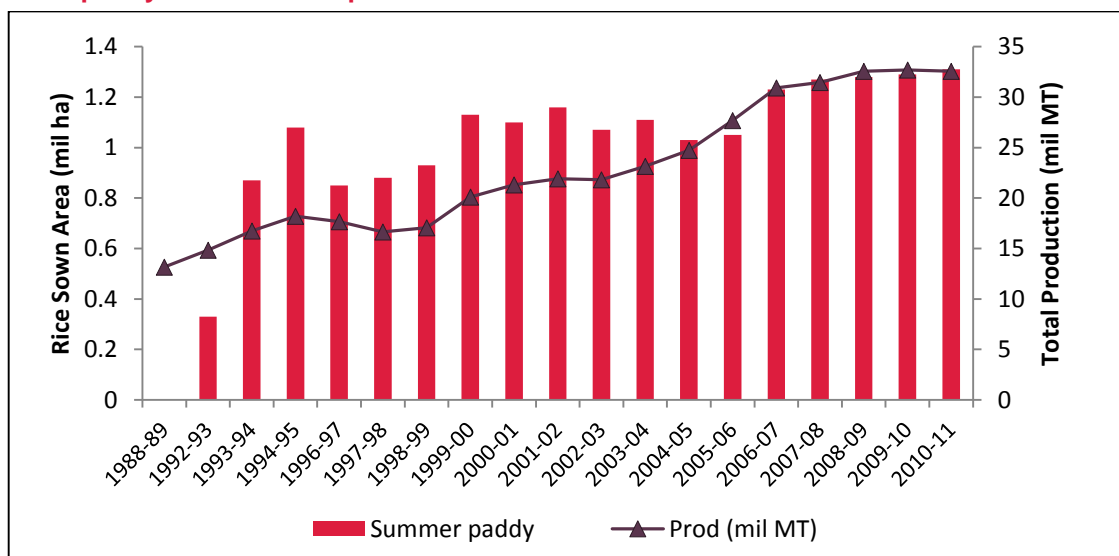


Table 2—High yielding varieties (HYV) in total paddy sown area and production trend in Myanmar

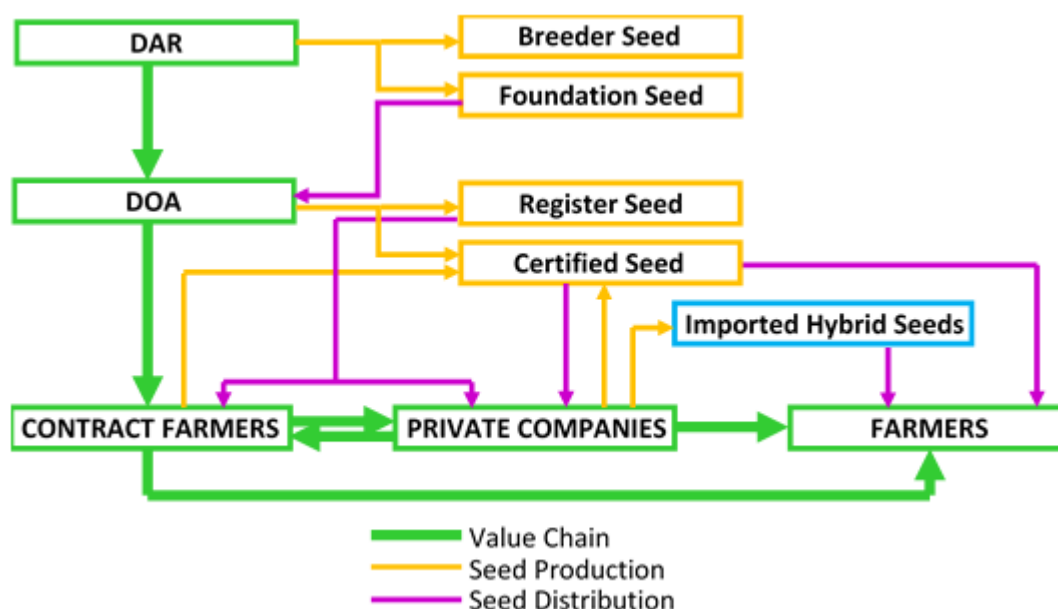
| Year | Sown Area (mil. hectare) | | HYV Area (%) | Production (mil mt) |
|-----------|--------------------------|------|--------------|---------------------|
| | Total | HYV | | |
| 1970-1971 | 4.98 | 0.18 | 4 | 8.2 |
| 1980-1981 | 5.13 | 2.32 | 45 | 13.3 |
| 1985-1986 | 4.90 | 2.39 | 49 | 14.3 |
| 1992-1993 | 5.13 | 2.68 | 52 | 14.8 |
| 1995-1996 | 6.14 | 3.20 | 54 | 18.6 |
| 2000-2001 | 6.36 | 3.45 | 54 | 21.3 |
| 2005-2006 | 7.39 | 3.40 | 46 | 27.6 |
| 2010-2011 | 8.05 | 3.66 | 45 | 32.6 |

Source: DoA, MOAI

There are 56 research and seed farms in Myanmar; 32 seed farms are under the supervision of Seed Division of DoA and 24 research farms are under the DAR. The DAR continues its efforts to develop hybrids of rice, sunflower, and maize but funding in addition to capacity constraints remains a challenge as agricultural research activities accounted for only 1 percent of total budget of MOAI in 2012-2013.

With greater liberalization in 2000, the volume of seed distributed by the public sector decreased and a system of contract farmers and public-private partnerships called Rice Specialized Companies (RSCs) was created. In this system registered seed produced by DoA research farms are transferred through extension agents to 4,900 RSCs in 530 villages for certified seed production aided by the Agriculture Extension Division (AED) (Figure 1). In 2011-2012 DoA produced 2400 tons of registered rice seeds from their 32 seed farms which was grown into 15,000 MT of certified seed by the RSCs. RSCs are then able to sell to local farmers or to contract farmers that produce grain. However, it has been estimated that 200,000 MT of certified seed are needed to cover 4 million ha of high potential land, which is about half of the total rice growing area. Based on this data, the current certified seed distribution system covers less than 10 percent of the estimated requirement. Although the government has recently tried to promote the development of private seed companies by providing tax exemption for the importation of agricultural inputs, including seed, there are still few other private sector rice seed companies that produce in sufficient volumes to fill this gap.

Figure 2—Value chain of seed industry in Myanmar



SEED MARKETING

The private sector began to engage in the commercial rice seed business with the formation of Myanmar Rice Industry Association (MRIA) in 2009, which was transformed into the Myanmar Rice Federation (MRF) in 2011. The MRF consists of 47 private rice companies, of which 10 private companies were producing 2000 MT of certified seeds or more in 2012 (Aung and Goletti 2013).

The C.P Yangon Seed Co. Ltd, one of the largest private sector seed companies in Myanmar, introduced hybrid corn seed production in 1996. The total demand for hybrid corn seeds is about 10,000 MT; and DoA and C.P Yangon Seed Company produce 7,000-8,000 MT annually through contract farming arrangements, providing parental lines, inputs, technical support, and a guaranteed price. The varieties used for hybrid seed production are CP 801, CP 888, and CP 301 which are sourced from Thai varieties. C.P Seed Company provides extension services, education activities such as field demonstrations, and seminars to farmers to encourage adoption maize hybrid. The rest of the demand (20-30 percent) for hybrid corn seed is imported annually from China, Thailand, and Vietnam through border trade. Asia seed, Pacific seed, Red Dot seed, and other Chinese hybrid corn seed companies produced about 300 MT each in similar contract farming arrangements.

The volume of vegetable seeds and fruit seedlings distributed by the Vegetable and Fruit Research and Development Centre (VFRDC) under DoA are minimal compared with the country's fruit and vegetable growing areas. It is estimated that of 450,000 ha where fruit and vegetables are grown, the area under hybrids accounts for 30-40 percent of the total. While hybrid vegetable seeds are produced locally the majority are imported from China, Thailand, Korea and Japan though interest in domestic production by local and foreign companies is growing. Seed export is minimal with the exception of some hybrid vegetable seeds such as bitter melon, tomato, chili, and melon. Seedlings of quality mango are distributed by the orchard farms of DoA and private seedling nursery farms that are mostly located in Mandalay Region.

CHALLENGES

Myanmar is undergoing a shift from a controlled economy to one which is market orientated. The seed sector has undergone some reforms, but many of these have not gone far enough to create an environment that is conducive to private sector involvement and investment. In addition, implementation of regulations stipulated in the Seed Law have been slow even after two years of its enactment. Many companies still remain unaware of the rules and regulation. However, as the country continues on its path of greater liberalization there are still important roles for the public sector to improve agriculture and to support a private sector led seed system.

At present, almost all seed production and distribution is handled by DAR and DoA with a limited amount of private sector involvement. However, the official seed system struggles to produce seeds in sufficient quality and quantity and many in rural areas are underserved. The extension service, responsible for seed distribution, lacks capacity and their numbers are simply not sufficient to

reach all farmers. This is exacerbated by poor infrastructure making transportation costly. The public sector has been successful in generating new varieties in part because of collaboration with international partners. The public sector must maintain this important role as research is the foundation for a strong seed sector.

The public sector must also establish a seed certification system and valid quality control mechanisms. There currently are not sufficient processing facilities to clean seeds, thus rendering policies that mandate high quality mute. Those processing plants which were established with assistance projects in 1980s, are poorly functioning due to a lack of maintenance and operational funds. Control should be given to the private sector so that they can invest and renovate these facilities. Government investment should focus on quality control to upgrade seed testing facilities to enable them to enforce the standards set out in the Seed Law.

The shortage of good quality seed is frequently identified as a major constraint to increasing crop production in Myanmar. A more harmonized public and private partnership is required that is capable of generating and delivering improved seed varieties to farmers and doing so cost-effectively. Such a system would be an important step toward ensuring a successful seed industry.

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