

History, growth and implications of formal seed system in Nepal

Kamalesh Adhikari

This Working Paper is an investigation of the history of the formal seed system and its implications for the customary seed system in Nepal. Analyzing the policy and institutional initiatives taken by the government between 1921 and 2013, the paper shows that the sole focus of the country's seed vision has been on a formal seed system that promotes the import and use of modern crops, including hybrids. The government assumes that such a formal model of seed policy is vital for public and private seed entities to address food security goals. However, the government's formal model of seed policy fails to address the needs of the customary or farmers' seed system. If corrective measures are not taken well in time, it may create further challenges for the conservation and development of native and local plant varieties that farmers have been using and exchanging within the customary seed system for seed and food security.

Customary seed systems—also known as local, traditional or farmers' seed systems—have their roots in the origin of agriculture, that is, long before formal seed systems appeared on the global agriculture scene. Irrespective of the presence of formal seed systems and though referred to as being informal, customary seed systems continue to play a crucial role in many developing and developed countries. These seed systems enable farmers to domesticate, select, plant, produce and exchange seeds of their preferences for seed and food security. As farmers in these seed systems depend largely on regular saving and farmer-to-farmer sharing of seeds of native and local plant varieties, customary seed systems also contribute to conserve native and local plant genetic diversity.

In contrast to customary seed systems, formal seed systems originated after plant breeding got its foothold as a profession in developed countries. As an important advancement in the early Nineteenth Century or so, the new plant breeding sector separated the profession of farming from seed production, creating a number of breeding communities and seed entities for formal breeding and commercial production of modern plant varieties. In the initial phase, formal seed systems generally relied on public sector-led plant breeding for variety development and seed production. In the case of developing and least-developed countries, the transfer of improved (modern) varieties through the Consortium of International Agricultural Research Centers (CGIAR) and movements such as the Green Revolution in the 1960s played a major role in creating public institutions to establish formal seed systems. Mainly since the 1980s, private sector participation in formal seed systems has been increasing for expanding the market of formal seeds. Such participation is generally supported by private sector-supportive seed and intellectual property laws that focus on a linear model of formal seed systems. Such a linear model involves a seed regulatory system that promotes the breeding, multiplication, certification, release, registration and marketing of high-yielding modern varieties, including hybrid and genetically modified varieties.

As in many other developing and least-developed countries of Africa, Asia and other regions, Nepal's seed sector is also divided into formal and informal seed systems. The government's "National Seed Vision 2013-2025: Seed Sector Development Strategy" (hereafter Seed Vision) recognizes the presence of formal and informal seed systems in the country as it states that:

"...The informal seed system is characterized by farmers producing and preserving their own seeds for subsequent planting. Often, they exchange this small amount of seeds with other farmers as gift, and for both monetary and non monetary value. Most traditional and local landraces are product of such selection and maintenance process. In addition, these landraces are important genetic resources for modern plant breeding. The formal seed systems are characterised by a vertically organised production and distribution of tested and released/registered varieties by public and private organisations using agreed quality control mechanism. It comprises different phases of seed cycle: Breeder, Foundation, Certified and Improved Seeds".

However, it is surprising that the long-term Seed Vision is only focussed on creating a supportive policy

environment for the formal seed system. There is no section dealing with the needs of the informal or customary seed system. The government's sole focus is on introducing strategic plans and measures for expanding the use of formal seeds of high-yielding varieties, including hybrids. Such an expansion is generally made possible by designing seed extension programmes to increase the replacement rates of formal seeds of both cereal and vegetable crops (see the table). It is despite of the fact that the Seed Vision itself recognizes that "there are limited number of farmer-preferred improved varieties developed, released and maintained" through the formal seed system and that the formal seed system contributes less than the informal seed system to address farmers' requirements of crop seeds in Nepal (see the table).

Against this backdrop, this working paper presents a historical analysis of the creation and expansion of the formal seed system in Nepal. It shows that Nepal's formal seed system supportive Seed Vision is not a recently conceptualized idea. It has a history of several decades of institutional efforts made by a number of government institutions, seed entities and external organizations. Building on the historical information and facts gathered for the period 1921-2013, the paper identifies some issues that policymakers, development practitioners and external organizations should consider for improving food security, plant genetic diversity and seed systems in Nepal.

Creation of formal seed system (1921-1955)

Nepal's initiative towards creating a formal seed system can be traced back to the 1920s, though formal seed production and distribution by the public sector started only after the country pursued development planning in the 1950s. As a major institutional step of the government in promoting agriculture development, *Krishi Adda* (Agriculture Office) was established in 1921. Then in 1925, this office was converted into Agriculture Department and an agriculture demonstration farm was established by the Department in Kathmandu, the capital city. In 1947, to promote agriculture research and experimentation on exotic crop varieties, an agriculture farm was established in Parwanipur of the Terai (plain, low land) region, and another one in Kakani of the hill region.

The country was not open to the outside world until the end of 1940s and was being ruled by the Shahs (kings), though the political power was effectively in the hands of the Rana family. After the collapse of the 104-years

Table	Seed replacement rates of cereal and vegetable crops of the formal seed system	
	Status in 2009	Projection by 2025
Cereal crops (rice, wheat and maize)	< 9%	25%
Vegetable crops	66%	100%

Source: MOAD. 2013. *National seed vision 2013-2025*. Lalitpur: Seed Quality Control Centre, Ministry of Agricultural Development, Government of Nepal.

of Rana oligarchy in 1951, the country witnessed the first parliamentary democracy with an alliance with the monarch of the Shah dynasty. This led to some initiatives to open up the country and obtain bilateral aid for development activities from several developed countries and the United Nations agencies. With the support from the United States (US), more experimental farms were established and different plants were imported for experimentation in government farms. Importing an US-designed community development approach from neighbouring India, the first development assistance received from the US in 1952 was used for agricultural development, including for the creation of the Agriculture Extension Service in 1953.

Expansion of public sector-led formal seed system (1956-1984)

A few years after the fall of the Rana regime, Nepal's First Five-Year Development Plan (1956-61) was introduced and implemented with much enthusiasm by the first democratic government. In this Plan, the government seemed committed to promote formal seed production and distribution by making available more efficient agricultural crops through selection, cross breeding and introduction from other countries; disseminating information about new crops; and educating farmers about the advantages of growing improved crops.¹

A School of Agriculture was created in 1957 to train agriculture extension workers such as junior technical assistants. Through this Plan, the government also supported the establishment of demonstration farms and a central breeding station linked with research stations in other zones for trial plantings, plant selection and breeding of varieties. It also established five agriculture extension centres, which expanded to nine during the Second Three-Year Development Plan (1962-65).

Since the early 1960s, new varieties of cereal crops (mainly rice, wheat and maize) were gradually introduced in different government farms and made available to farmers through extension services. For

instance, the first high-yielding variety of wheat called Larma 52, brought from Columbia, was introduced in 1960 for mid hills. As a trickle-down approach, the government initially mobilized village development workers (to distribute improved agricultural inputs to the farmers) and junior technical assistants (to disseminate information on improved agricultural practices). It was assumed that after a few innovative farmers benefitted from the adoption of improved agricultural innovations, their fellow farmers would be motivated to follow suit.

In 1960, political parties were banned and power was centralized by the royal palace of the Shahs under the *Panchayat* Regime, which lasted until the end of 1989. Notwithstanding this shift in the political regime, the government's seed policy did not change but expanded to focus more on the promotion of the formal seed system through the public sector.

In the Second Three-Year Development Plan (1962-65), which was also the first monarchy-led Plan, major emphasis was given on the provisioning of agriculture extension. Eleven agronomy farms were established to produce seeds for distribution to farmers.² A central seed testing laboratory under the Agronomy Division of the Department of Agriculture³ was established in 1962. The laboratory provided seed testing services to agriculture farms for ensuring quality seed production and distribution, and in 1964, was able to obtain a designated membership of the International Seed Testing Laboratory.

The Third Five-Year Development Plan (1965-70) aimed at "introducing modern techniques to replace the existing primitive practices of local farmers".⁴ An Agricultural Supply Corporation was established in 1965 to promote the use of fertilizers, insecticides, agricultural implements, and importantly, improved seeds. The strategy was to mobilize the Corporation for producing, collecting, procuring and distributing improved seeds; testing for purity of seeds; protecting seeds from insects; and grading the seeds.

By the end of this Plan, out of 1,845,000 hectares of the country's cultivated land, improved seeds were being used in 102,630 hectares of land. For the distribution of improved seeds, the Third Plan aimed to establish additional agronomy farms. It emphasized the production of nucleus seeds in government farms and their distribution among the registered seed producers, who would grow seeds under the guidance of technical advisors provided by the government.

Arun 2 of CIMMYT, and in 1984, Makalu 2, a locally originated variety, were released. For wheat, three improved varieties were released, of which one was introduced from Mexico and two others from India.

Rise of private sector as a formal seed actor (1985-2013)

The decade of the 1980s witnessed the intensification of globalization, liberalization and privatization throughout the world. For developing countries, structural adjustment programmes were prescribed as a major set of regulatory reforms in the overall development sector, including agriculture. Nepal was not an exception. Since the mid-1980s, Nepal gradually embarked on the path of liberalization and globalization. The open and liberal economic measures were designed under the Structural Adjustment Programme and the Enhanced Structural Adjustment Facility due to pressures for economic reforms from the Bretton Woods Institutions.

One important feature of the Seventh Five-Year Development Plan (1985-1990) was that the government gradually shifted from the state-led development strategy and started to call for private sector participation for the economic good of the country.¹¹ Hence, while the public sector was a major actor in supporting the growth of the formal seed sector until the 1980s, a number of significant changes took place thereafter. Economic and development policies were revised or introduced to strengthen the role of the private sector. In 1988, with technical support from external agencies such as GTZ and USAID, the Seed Act came into being to regulate seed production and marketing in the country. The Act also created a legal space for the promotion of the private sector in seed business. In order to capitalize on such an opportunity, in 1989, Seed Entrepreneurs Association of Nepal came to the forefront as the first national association of seed entrepreneurs engaged in the sale as well as import of improved (including hybrid) seeds.

Then, following the people's movement of 1990, multi-party democracy was restored with a minimal power to monarchy, that is, constitutional monarchy. Such a major political shift and some institutional reforms made thereafter did not, however, make any change to the government's approach towards the seed sector. The formal seed system continued to receive policy and institutional support for promoting the use of improved seeds and fertilizers through the public as well as the private sector.

In 1990, the second National Seed Seminar was organized to discuss strategies to promote the formal seed system. Since the private sector in Nepal was only operating as seed traders and not as agents of variety development and breeding, the Nepal Agricultural Research Council was established in 1991 as an autonomous public sector organization to conduct agricultural research in the country and as the main agency to supply breeder and foundation seeds.¹²

During this Plan's period, 12 rice varieties were released, most of which were introduced from IRRI, Sri Lanka, Indonesia and India. In the case of wheat, reliance on external agencies and other countries continued as four maize varieties were released by bringing the parental lines from CIMMYT and India. One important development in variety release and registration was the start of the registration of improved seeds of a range of imported vegetable crops since 1990.

In the Eighth Five-Year Development Plan (1992-97), which was the first plan formulated after the restoration of democracy, the newly formed government pursued the approach of leading "development through the market-oriented, open and liberalized economy".¹³ Following the implementation of Nepal's Structural Adjustment Programme and consequent liberalization initiatives undertaken during this Plan's period, privatization of public enterprises and the involvement of the private sector in economic and agriculture activities featured in the government's policies.

Such policies led to reforms in agriculture research and extension services. The Plan undertook the strategy of gradually involving the private sector in the production, import and sale of improved seeds, emphasizing that efforts would be made to enable the private sector to fully undertake these functions by the end of the Eighth Plan. Specifically, the Plan aimed at increasing the area of paddy fields covered by improved seeds from 55 percent to 75 percent, the area of wheat fields from 80 percent to 100 percent, and the area of maize fields from 40 percent to 60 percent. In the case of millet and barley too, it set the target of using 60 and 56 metric tons of improved seeds, respectively, by the end of the Plan period, which was 20 metric tons and 10 metric tons, respectively, in the first year of the Plan.

In the Ninth Plan (1997-2002), the government aimed to develop the agriculture sector through the implementation of the Agriculture Perspective Plan, which was an ambitious 20-year plan implemented since 1997 to direct Nepal's agriculture into a

commercial track of production and productivity.¹⁴ Both of these plans had the strategy of making Green Revolution-based improved technology the basis of speedy economic development. These plans thus focussed more on the availability of chemical fertilizers and agriculture loans, by committing to support private, public and non-government sectors for the supply of such inputs under a market-oriented mechanism, for example, by removing subsidies on the supply of chemical fertilizers. The Plan encouraged imports of hybrids although it called for the tracking of such imports. It stated:

“Some private traders sometimes import hybrid crop seeds from the neighbouring country. Such information should be recorded by the Nepal Agriculture Research Council and be ready to solve the problems of hybrid seed availability. It should also collect information related to hybrid seeds from the international agency and disseminate such information to extension workers and farmers.”

In 1999, a National Seed Policy was introduced to create an enabling policy environment for public and private sectors to develop crop varieties, multiply different classes of seeds, and market and trade improved seeds. In the same year, subsidies on chemical fertilizers were completely abolished¹⁵, except for transportation to make fertilizers available in 26 remote districts. In 2001, Nepal also introduced the National Fertilizer Policy to encourage the private sector for making chemical fertilizers available for increased agriculture production and productivity.

The Tenth Plan (2002-2007) emphasized the role of the government as being “that of catalytic, facilitator, and regulator to strengthen the liberal and open market-oriented economic activities” and aimed to enhance the role of the private sector in agriculture.¹⁶ Some important reforms were undertaken during this Plan’s period to strengthen the formal seed system. In 2002, a National Seed Quality Control Centre came into being for quality control of improved seeds. In the same year, under the Company Act of 1997, the Agriculture Inputs Corporation was split into two different entities, namely Agriculture Inputs Company Limited and National Seed Company Limited, to handle fertilizers and seeds separately.

In 2005, the then king took over the political power, which frustrated the political parties, including the Maoists.¹⁷ Yet, the government’s thrust to strengthen the formal seed system continued as in the past. While

a number of rice varieties were released by importing the parental lines from other countries, there was an important development in the case of maize varieties. The first hybrid maize variety called Gaurav was introduced from CIMMYT for release and dissemination among farmers. Then, in 2006, Shitala from Mexico and Deuti from Zimbabwe were released as improved maize varieties. In the case of wheat, in 2004, a locally originated variety called Gautam, and in 2007, WK 1204, introduced from Mexico, were released.

The people’s movement of 2006 led to the complete collapse of monarchy from Nepal. A Comprehensive Peace Agreement between the Maoists and the new democratic government was signed and negotiations under a newly formed Constituent Assembly started for a new Constitution. Following this, the Interim Constitution of Nepal, 2007 was introduced.¹⁸ It recognized food sovereignty as a basic human right. In the same year, Nepal also ratified the ILO 169 (Indigenous and Tribal Peoples Convention), recognizing various rights of indigenous and tribal peoples, including the rights in relation to food and natural resources.

These developments had a direct impact on development planning too. For the first-time ever in the history of development planning, the Eleventh Plan (2007/08-2009/10) included a separate section on “food security” aiming to establish the right to food in Nepal. The Plan had an objective to increase national self-reliance in basic food products and a mission to bring into force a Food Sovereignty Act.¹⁹ Such a vision could be a reason for the Plan’s introduction of a Targeted District Priority Production Programme so that each district of the country becomes self-sufficient in one or more than one type of crop seeds.

The government, however, did not seem to have put a different vision as far as the formal seed system was concerned. For example, in another separate section on agriculture, as in the previous plans, the Eleventh Plan set the priority to produce, multiply and supply improved seeds to farmers and to facilitate the accreditation of the Central Seed Testing Laboratory with the International Seed Testing Organization.

By mobilizing local government bodies, it aimed at making the monitoring and regulatory activities more effective to ensure “the sale and distribution of seeds of known quality”. For the purpose of facilitating the supply of quality seeds and chemical inputs, the Plan called for the establishment of community and

of local farmers and people. Another strategy would be to develop a clear-cut plan for the use of hybrids in Nepal. For example, it is essential to identify in which regions and crops there is a need to promote hybrids, and in which other regions and crops, there is a need to promote non-hybrids or native and local plant varieties. As Nepal prepares to introduce a separate law on plant variety protection as part of its intellectual property commitments at the World Trade Organization, there is also a need to develop a proactive plan to minimize the effects of the intellectual property system on the country's agriculture and seed systems, including the local seed system. ■

Notes

- ¹ http://www.npc.gov.np/images/download/FirrstPlan_Eng1.pdf (last accessed 12 March 2015).
- ² http://www.npc.gov.np/images/download/Second_Nep.pdf (last accessed 12 March 2015).
- ³ After the fall of the Rana regime in 1951, the new government had terminated the Agriculture Council and Agriculture Development Committee, and formed the Department of Agriculture.
- ⁴ http://www.npc.gov.np/images/download/Thirs_ENG.pdf (last accessed 12 March 2015).
- ⁵ http://www.npc.gov.np/images/download/fourth_eng.pdf (last accessed 12 March 2015).
- ⁶ In 1972, the Agriculture Supply Corporation was merged with the Food Management Committee for a new institutional set up called Agriculture Marketing Corporation. This Corporation dealt with both agricultural inputs and food grains. In 1974, the government, however, decided to split the Agriculture Marketing Corporation into two corporations. As a result, the Nepal Food Corporation came into being for the marketing of agricultural produce, and the Agriculture Inputs Corporation for agricultural inputs, including seeds and fertilizers.
- ⁷ http://www.moad.gov.np/downloadfile/combibed_1374486353_1423039234.pdf (last accessed 12 March 2015).
- ⁸ http://www.npc.gov.np/images/download/fifth_eng.pdf (last accessed 12 March 2015).
- ⁹ A Tuki referred to an enlightened farmer who was supplied with improved inputs in order to practice in his/her own farmland so that he/she would also motivate other fellow farmers to follow suit.
- ¹⁰ http://www.npc.gov.np/images/download/sixth_eng.pdf (last accessed 12 March 2015).
- ¹¹ http://www.npc.gov.np/images/download/seventh_eng.pdf (last accessed 12 March 2015).
- ¹² <http://narc.gov.np/narc/index.php> (last accessed 15 March 2015).
- ¹³ http://www.npc.gov.np/images/download/eighth_eng.pdf (last accessed 15 March 2015).
- ¹⁴ http://www.npc.gov.np/images/download/ninth_eng_2.pdf (last accessed 15 March 2015).
- ¹⁵ In 1997, a decision was made to allow the private sector to import and market chemical fertilizers, and to gradually reduce government subsidies on them.
- ¹⁶ http://www.npc.gov.np/images/download/10th_eng.pdf (last accessed 15 March 2015).
- ¹⁷ The Maoists had started an armed conflict in the country in 1996, with severe implications for rural livelihoods and agriculture across all regions.
- ¹⁸ <http://www.dor.gov.np/documents/Interim.Constitution.Bilingual.UNDP.pdf> (last accessed 15 March 2015).
- ¹⁹ http://www.npc.gov.np/images/download/11tyip_eng.pdf (last accessed 15 March 2015).
- ²⁰ http://www.npc.gov.np/images/download/TYP_2012.pdf (last accessed 15 March 2015).
- ²¹ Unlike the seeds of open-pollinated plant varieties, "the biggest disadvantage of hybrid seeds is that they don't "reproduce true" in the second generation. That means that if you save the seeds produced by F1 hybrid plants and plant them, the plant variety that will grow from those seeds (known as the second generation) may or may not share the desired traits you selected for when creating the first generation hybrid seed" (extracted from <http://www.foodrenegade.com/hybrid-seeds-vs-gmos/>).



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