



The Republic of the Union of Myanmar
Ministry of Agriculture, Livestock and Irrigation



THE NATIONAL SEED POLICY

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Foreword

The adoption of a National Seed Policy gives Myanmar a great opportunity to strengthen the agriculture of the nation and reinforce its contribution to the national economy and food security. Beyond our own efforts in seed development, the global seed industry is undergoing immense changes. While some of these changes can be of benefit to the Myanmar seed sector, others have the potential, if not adequately harnessed, of leading to frustration and wasted investments. Several issues relating to agricultural research, seed production, the private seed sector, seed legislation, plant variety protection, seed marketing, the informal sector, seed extension, seed industry oversight arrangements; international cooperating agencies and many more, pose difficult challenges for which answers must come from carefully formulated seed policies.

A National Seed Policy is a statement of the philosophy and intentions of Government and the required roles of all participating agencies and stakeholders regarding the desired structure, functions and development of the seed sector. Using this policy as a road map, the Ministry of Agriculture, Livestock and Irrigation will be able to obtain the necessary support and cooperation at all levels in its seed development activities. Further, farmers and the mass of the population will benefit from food security arising out of enhanced farm productivity.

The Ministry of Agriculture, Livestock and Irrigation has ensured the maximum participation of all stakeholders in the seed policy formulation process and this should ensure a wide sense of ownership and foster close collaboration among colleagues of the seed industry during implementation.

The Ministry of Agriculture, Livestock and Irrigation will shortly start consultation with all stakeholders to revitalize the National Seed-related Committee which will be given additional responsibility to oversee the National Seed Policy and be accorded a high degree of autonomy and freedom to carry out its functions.

It is my hope that all stakeholders in the seed sector will be guided in their work by this policy and gain from it. I thank all of you for your individual efforts in the formulation and adoption of the National Seed Policy and look forward to your cooperation in its implementation.

Aung Thu

Union Minister

Ministry of Agriculture, Livestock and Irrigation

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Centre
DAR	Department of Agricultural Research
DOA	Department of Agriculture
FAO	Food and Agriculture Organization of the United Nations
GMO	Genetically Modified Organism
IARCs	International Agricultural Research Centres
ICRISAT	International Crops Research Institute for Semi-arid Tropics
IPR	Intellectual Property Rights
IRRI	International Rice Research Institute
ISF	International Seed Federation
ISTA	International Seed Testing Association
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
JICA	Japan International Cooperation Agency
MOALI	Ministry of Agriculture, Livestock and Irrigation
NBF	National Bio safety Framework
NSC	National Seed-related Committee
NSP	National Seed Policy
PVP	Plant Variety Protection
PBR	Plant Breeders' Rights
PGRFA	Plant Genetic Resources for Food and Agriculture
TSC	Technical Seed Committee
UNDP	United Nations Development Programme
UPOV	International Union for the Protection of New Varieties of Plants
WB	World Bank

1. Introduction

Agriculture is the mainstay of Myanmar's economy and the foundation of food security of its people. Since seed is the most critical input in improving productivity of agriculture, there is an overriding need to position the seed sub-sector in the country's development framework in a way that would support adequate growth in the agriculture sector. In this context, the Republic of the Union of Myanmar realizes the need to develop a national seed programme that would support the economic and food security goals of Myanmar. It is aware that a vibrant seed industry should be in place to ensure that farmers have access to quality seeds on time at affordable prices. The Government acknowledges that a seed policy, as a blue print for development, would set the stage for complementing the complex set of technological and organizational structures to underpin an effective seed industry.

The Ministry of Agriculture, Livestock and Irrigation (MOALI) with the assistance of the Food and Agriculture Organization (FAO) of the UN formulated the National Seed Policy through a participatory process that started in October 2012 with holding of a two-day national consultative meeting on seed policy represented by all major public and private sector stakeholders of Myanmar's seed industry. A sixteen-member Seed Policy Drafting Taskforce was subsequently established to elaborate on the consultative meeting recommendations. The National Seed Policy was finalized having taken into account the wide range of views and recommendations drawn through this participatory process. It also took into account the existing seed sector legislations.

The National Seed Policy is the key document by which the Government would seek to utilize the relative strengths of both public and private sector seed industry stakeholders so that limited national resources can be effectively used to develop and deploy all available structures. This would assure all farmers of a continuous access to quality seeds and their use suited to their crop lands and their farming contexts.

2. Objectives of the National Seed Policy

2.1 Overall objective

To support the establishment of a sustainable seed industry through systematic and strategic approaches which would continuously create and supply new improved varieties and further, support successful seed production, certification and marketing systems in order to form the basis for an overall development of the agricultural sector.

2.2 Specific objectives

- To assure continuous access of all farmers to quality seeds of improved high yielding crop varieties and promote utilization of quality seeds suited to farmers' socio-economic contexts.
- To contribute to enhancing productivity in agriculture.
- To strengthen the food security of Myanmar.
- To improve both the quantitative and qualitative aspects of agricultural product exports.
- To obtain a marketing advantage in global trade.
- To improve the returns on public sector investments.

3. Scope of the National Seed Policy

The principles of this policy shall be applicable to all seeds (including both true seeds and vegetative planting materials) which are of economic importance in Myanmar. However, for practical purposes, programmes and actions derived from this policy shall focus on thirty one major crops, including cereals, legume, root and tuber, oilseed, fruit, vegetable crops and industrial crops, designated as priority crops, listed in Annexure 1. All stakeholders engaged in non-priority crops should be well guided by the principles enshrined in the policy.

4. Overall Strategy of the National Seed Policy

The following strategies, among others, shall be followed to achieve the objectives stated above:

1. Support and sponsor as public sector activities related to seed research, foundation seed production, seed quality assurance and seed extension.
2. Support through the Seed Division and Extension Division of the DOA the *Seed Village Scheme* by which organized seed growers at the village level produce certified seeds on commercial basis with the goal of further commercializing it. Toward that end, Government will initiate pilot activities involving selected seed centres operated by Seed Division of the DOA. In line with that, the Seed Division shall establish appropriate technologies and practices of out-grower schemes, seed processing and storage and seed marketing as add-ons to existing seed processing and storage centres.
3. Encourage the private sector, through various incentive schemes, to progressively expand its activities in certified seed production and marketing of the major crops, especially rice.
4. Support elevating private sector capacity in both research and foundation seed production at an acceptable level by making available to the private sector the publicly available foundation materials generated by DAR and DOA.
5. Undertake all steps and policy measures to gradually reduce the role of the public sector from commercial operations to mainly provision of services and facilitation in anticipation that the private seed sector would eventually dominate all aspects of the seed sector which lend themselves to commercial operations.
6. Boost the demand for quality seed, the key factor for expanding the size of the seed industry, through adoption of pluralistic extension approaches to support emergence of the private sector as partner of public extension organizations and undertaking farmers' training on the use of quality seeds and other seed promotional programmes.
7. Strengthen seed certification, quality control, and testing facilities.
8. Assist the private sector to progressively develop internal seed quality assurance structures that will aid seed companies to participate in licensed seed quality assurance in due course.
9. Since farmer-produced seeds remain the major source of seeds for planting, undertake efforts to improve on-farm seed management practices and link the formal and informal seed systems more closely together.
10. Authorize the establishment of a national seed reserve as part of a seed security scheme to safeguard against seed-related emergencies.
11. Adopt a wide range of strategies to develop the seed industry and allocate the needed national resources as the prime source of funding. However, Government will be open to assistance from donors and relevant international organizations with whom Government will endeavour to establish links during the implementation of this policy.

12. The criteria for assessing the seed policy and the national seed programme should be the net benefit of the overall seed industry to farmers, the contribution to overall national food security, the economic sustainability of public sector activities at minimum recurrent cost, the sustained profitability of the private sector-led business components and the absence of any adverse environmental impacts.

5. Responsibility and Administration of the National Seed Policy

The responsibility for the National Seed Policy shall rest with the Minister for the Ministry of Agriculture, Livestock and Irrigation under whose authority and oversight the policy has been formulated and eventually adopted by Government. The responsibility of the Minister, exercised through the National Seed-related Committee and the Seed Division, will cover the overall dissemination of the policy to the general public, especially seed industry stakeholders; public education and awareness creation; implementation of specific interventions arising out of a national plan which will be prepared to provide practical effect of the provisions of the seed policy; monitoring and evaluation of compliance and impact; as well as a process of updating, as provided for in the policy.

Although the National Seed Policy ideally should have preceded promulgation of the Seed Law, Myanmar has already passed the Seed Law. Moreover, the New Plant Variety Protection Law, the Law of Protection of the Farmer Rights and Enhancement of their Benefits and Regulations Relating to the Seed Law have already passed.

The enforcement of the National Seed Policy shall be the responsibility of the National Seed-related Committee (NSC). The NSC shall mandate the Seed Division to carry out field activities and other actions which will require sustained or continuous operations. With the coming into force of this policy, the membership of the current NSC will be revised to ensure that the private sector is well represented to reflect Government's desire of their expanded role in the seed industry and to establish a level playing field for all seed industry participants.

The NSC shall be charged with the overall responsibility of advising the Government on all matters relating to the National Seed Policy and all ensuing legislations and protocols as well as seed industry planning and implementation. The terms of reference of the NSC shall reflect its crucial role of serving as guide, counsel, arbiter and lobbyist on behalf of the seed industry. The NSC will meet periodically and will organize meetings to review progress of the national seed programme.

The NSC will be responsible for coordinating the review and updating of the seed policy to keep it current and applicable. In line with that, the NSC will, from time to time, make recommendations to the Union Minister for the Ministry of Agriculture, Livestock and Irrigation on issues relevant to the seed industry. The Union Minister for the Ministry of Agriculture, Livestock and Irrigation shall consider such recommendations, discuss them with stakeholders, and issue modifications in the National Seed Policy to improve its suitability and applicability to current conditions without changing its long-term intent and validity.

The NSC will also oversee a Technical Seed Committee responsible for variety release and registration as provided under the Myanmar Seed Law. With the coming into force of this policy, the NSC shall make recommendations to the Ministry of Agriculture, Livestock and Irrigation for the revision of the Technical Seed Committee, to incorporate private sector membership as appropriate.

6. Plant Genetic Resources, Research and Variety Development

Research and Variety Development form the basis for continuous supply of new improved varieties with high-yielding and other desired traits. The main raw materials for variety development are plant genetic resources that need to be properly collected, stored, and enhanced to ensure the availability of a wide genetic base. Maintenance of a broad genetic base of parent materials including indigenous germplasm as well as elite lines and advanced breeding materials developed elsewhere is vital for development of new varieties that are adapted to diverse agro-ecological zones of Myanmar.

The key policy objective is to develop national capacity to undertake both basic and adaptive research in collaboration with partners, both internal and external, in order to derive new varieties that are most suited to the country's diverse agro-ecologies. It is also important to ensure that the processes of variety testing, release and registration as well as the issues of ownership and other rights are adequately addressed as per international norms and standards. The government will pursue the following policy actions to address these issues:

a) Priority Crops

- The national plant variety development programme will direct focused efforts on development of improved varieties of priority crops (shown in Annexure 1) established on the basis of economic importance and potential impact on food and nutrition of the people of Myanmar.
- The Department of Agriculture (DOA) and the Department of Agricultural Research (DAR) will periodically review the prioritisation of crops that feature in research and the national seed programme to conform it to national needs.

b) Variety Adaptation and Acceptance

The Republic of the Union of Myanmar will provide support to collection, conservation and utilization of plant genetic resources to enable optimum use and preservation of Myanmar's rich germplasm.

- The rich diversity of indigenous plant genetic resources will be conserved and utilized for the breeding, improvement and selection of new varieties.
- Indigenous and exotic plant materials going out or coming into the country shall be covered by a Material Transfer Agreement (MTA) and will adhere to the provisions stated in the Plant Variety Protection regulations of Myanmar.
- Breeding Institutions in the country can accept plant genetic materials from other institutions outside the country for the purpose of improving local crop varieties, and for developing and breeding of new varieties.
- The national agricultural research organizations will be encouraged to enhance collaboration with the International Agricultural Research Centres (IARCs) and obtain advanced lines and improved breeding materials for testing and further breeding work.
- Furthermore, the DOA will take appropriate steps to facilitate participatory breeding through enhancing farmer's cooperation and participation in the conduct of variety trials and evaluations.
- All candidate varieties regardless of origin shall be entered into a system of national trials which will ascertain their productivity, stability and adaptation to the diverse ecologies and farming systems of Myanmar.
- In order to enhance the effectiveness of variety research, Government will aim at the following steps:

- Reduce the period of testing by increasing the test locations and by strengthening the facilities and resources of the breeding stations.
- Ensure that new varieties fully reflect the priorities of agriculture, by establishing annual coordination meetings, once a year, between DOA and DAR.
- Strengthen early generation seed (Foundation and Registered Seeds) production in cooperation with the private sector.
- The Government will accelerate research, testing and introduction programmes of the newly introduced hybrid technology in order to gain from its advantages.
- The Ministry of Agriculture, Livestock and Irrigation (MOALI) will undertake a rapid and well-planned national testing programme for assessment of suitability of crop lands for hybrid varieties and identification of potential areas where the seeds of the hybrids can be most successfully produced.
- The Government is committed to pursuing a sound hybrid rice policy, recognizing that the future of the hybrid technology rests on the ability of national research to develop suitable parental lines adapted to local conditions, identify the best locations and agro-ecological conditions for growing hybrid rice seed in the country.

c) *Variety Registration*

- The National Seed-related Committee (NSC), on the advice of the Technical Seed Committee (TSC), will be the sole body responsible for the registration of crop varieties in Myanmar.
- The responsibility for proving the uniqueness of a nominated variety will rest on the breeder or the sponsoring research agency.
- Records of all registered varieties will be kept at the Secretariat of the NSC.

d) *Genetically Modified Organisms (GMOs)*

- The Government will investigate, in collaboration with its development partners, the applicability of relevant aspects of GMO technology to Myanmar to derive desired benefits. However, it will remain alive to possible negative side effects of GMO technology and encourage the research institutions to acquire expertise and skills in practices of modern biotechnology, particularly with regard to bio-safety in the application of GMO technology. Only non-food GMO crops will be partially accepted.

7. Seed Production

The key prerequisite for rapid dissemination of new varieties is systematic multiplication of the limited quantities of nucleus seed to meet the requirements of farmers in all the areas that the new varieties are suited for cultivation. Seed multiplication is the step-wise controlled increase of initial seed of a higher class in order to achieve targeted volumes of a lower class without unduly compromising on the inherent quality values passed by quality assurance and originally selected by the breeder.

The seed industry of Myanmar follows a four generations system of seed and recognizes four seed classes, namely, breeder, foundation, registered and certified seed. Certified seed production is largely via a system by which ‘seed villages’ mass-produce the final class in seed multiplication of the allocated variety. Although this system possesses the potential to minimize the cost of seed provision at the national level, several constraints have caused the system to remain the weak link in the seed chain in Myanmar.

The main policy objective is to ensure that the Seed Division is strengthened to enhance its production of the early generation seed (foundation and registered seed) and further, to strongly support the private sector to take up responsibility for the production of the certified seed class. In order to be able to do this, private sector operators will be assisted with foundation seeds from the public sector under reasonable terms. This would help them to progressively develop their capability for production of their own breeder and foundation seeds as soon as possible. To achieve this, the government will undertake the following actions:

a) *Early Generation Seed Maintenance and Supply*

- The originator research agency, whether public or private, will be responsible for maintenance and supply of breeder seed of improved varieties. DAR and the Seed Division of DOA will continue to bear the responsibility for production of foundation seed from publicly developed varieties.
- The Government will provide adequate staff, facilities and budgets to concerned agencies to ensure timely supply of the required amounts of breeder and foundation seed. To the extent possible, it will explore options for commercialization of some aspects of these operations. Government-produced foundation and other early generation seed, depending on availability, shall be allocated at reasonable cost to qualified private-sector agencies upon request in conformity with the procedures under the Seed Law and in compliance with the New Plant Variety Protection Law which has been recently promulgated. The private sector will be free to produce foundation seed from their own breeder seed in line with the provisions of the Seed Law.

b) *Certified Seed Production*

- The Seed Division of DOA will take steps to establish pilot seed multiplication stations. These stations will organize seed growers in the village on the basis of contract for seed production, procurement of harvested material, conditioning the raw seeds and holding the cleaned seed in the warehouses until the next production season for sale to rice growers. This will help promote seed marketing as well as attract the private sector into contract seed grower schemes, the main strategy used in private sector seed production.
- The pilot stations will be allocated a revolving fund to finance their operations. The main objective of the pilot stations is to educate and raise awareness to boost the interest and capacity of village seed growers who are expected in due course to expand the pilot operations on their own.

8. Seed Conditioning and Storage

Newly harvested seeds potentially have very short life as viable, healthy and manageable products. To prolong their qualities, they require to be safely and rapidly transformed from their perishable state into dry, clean, treated and graded material to survive the long period of storage until they are used. Modern seed conditioning equipment and appropriate storage systems are necessary to safely prepare and hold the large quantities of certified seed that are produced as end products of the seed chain. Myanmar already has considerable investments in this area as represented by several modern seed conditioning plants operated by DAR and Seed Division in several locations in the country.

The main policy objective is first to ensure that past investments in seed conditioning and storage are adequately protected, maintained and efficiently deployed to meet the needs of existing public sector agencies involved in breeder and foundation seed production. Secondly, the objective would be to

utilize the spare capacity of existing seed plants to service the needs of the emerging private sector, work towards privatizing any redundant seed plants and encourage the private sector to invest in this area to meet their own specific needs. To achieve this, the following measures will be taken:

- The Government will make adequate annual budgetary allocations to ensure the proper upkeep and operations of all current public seed processing and storage facilities at both research and seed production levels.
- The Government will encourage and assist all relevant agencies in both public and private seed sectors to develop and maintain their own up-to-date and efficient seed conditioning facilities.
- The public and private sector seed agencies shall be encouraged to provide seed conditioning services to small or new seed operations on a fee basis, to assist in developing the seed industry.

9. Seed Regulatory Framework

9.1 Seed Quality Assurance

The use of good quality seeds leads to high yields and safeguards against proliferation of diseases and pests. A system of quality monitoring, adherence to standards and their enforcement, referred to as quality assurance, is a basic feature of an effective seed industry. Quality assurance permeates the entire spectrum of the seed programme from field production, processing, packaging, storage to marketing. Seed quality assurance lends credibility to the seed as a specialized commodity since it instills confidence in farmers in getting the expected results from using the product.

Seed quality assurance entails, among others, inspection and evaluation in field and stores, representative seed sampling, and laboratory seed testing according to prescribed standards. The ultimate aim of seed quality assurance is to ensure that the seed industry produces only quality seeds that have high varietal and physical purity, high germination ability and vigor, that meet the minimum requirement of seed moisture content and have a sound health. The Seed Law and its related Seed Regulations are aimed at ensuring that seeds generated in the formal seed sector possess the above attributes. In order for the newly enacted seed legislation to have the desired impact particularly in terms of improvement of seed quality, the entire seed industry must respect and adhere to the provision of the seed legislation. Seed quality assurance in Myanmar is under the mandate of the Seed Division which operates a central and regional seed laboratories strategically located around the country.

The objective of the policy is to enhance the maintenance of high quality of seeds of crop varieties at the points of production, handling and also moving in commerce. The following actions will be taken to implement this policy:

- The Government will improve the institutional arrangements for seed quality assurance so that seed legislation and other quality assurance activities achieve the desired impact in the field.
- For this purpose, steps will be taken to increase the number of seed laboratories and recruit additional field inspectors and suitably locate them in strategic production areas in order to achieve sufficient seed quality control coverage.
- Greater operational autonomy will be provided to the present Seed Quality Control Unit with the goal of transforming it into a unified Seed Certification Unit (SCU), as a specialized agency under the overall responsibility of the Seed Division. The proposed SCU will bring all the seed laboratories and field inspectors under one coordinated national seed certification

system, which shall also have responsibility for Variety Registration but also have adequate flexibility to enable rapid regional and local responsiveness.

- The Government will encourage the private sector to develop their own internal seed laboratories and other seed quality operations. Support to private sector capacity building will be designed to help achieve acceptable levels of expertise and facilities so that the public seed certification agency can partner with the private sector operators in carrying out licensed seed quality testing under its general supervision.
- The seed quality control operations by the public seed quality agency will remain a public service. However, in view of the high cost of operating seed quality processes, when the seed industry has advanced appropriately, Government will periodically review seed inspection and testing charges in order to raise revenue to complement the required national budgetary support.

9.2 Plant Protection and Quarantine

The role of plant protection and quarantine is to conduct inspections at ports of entry to prevent seeds and planting materials as well as soil contaminated with exotic insect pests and diseases, mites and extraneous materials from entering Myanmar and causing harm to the nation's agriculture. An effective plant protection and quarantine service can also help to assess and quantify crop losses, monitor and provide pests and disease forecasting information, and develop and disseminate pest control practices to farming communities through collaborative research and training.

Myanmar's Plant Pest Quarantine Law and the existing Regulations are in line with international norms and national requirements. The eleven active plant quarantine stations of the Plant Protection Division are charged with responsibility to enforce the provisions of the concerned existing regulations in cooperation with Myanmar's Customs Departments. The objective of this policy is to ensure adequate plant quarantine checks are in place at all entry points in order to safeguard against introduction of pests and diseases. The following measure will be put in place to achieve this:

- The Government will continue to provide the required resources, both human and material, to the Plant Protection Division, so that adequate safeguards are developed at the country's borders and entry points to prevent introduction of contaminated seeds as well as new plant pests and diseases which would affect crop production.

9.3 Variety Release

The purpose of Varietal Release is to regulate the entry into the seed programme of newly developed varieties and ensure that such varieties consistently demonstrate their superiority in performance and characteristics as compared with existing varieties. Variety Release can also prevent the use of varieties that might have a negative impact on agriculture such as those susceptible to major diseases that could create the risk of significant production loss. The Seed Law of Myanmar provides for a Technical Seed Committee which is answerable to the National Seed-related Committee for the oversight of the variety release processes.

The policy objective is to ensure that elite breeding lines proposed as candidate varieties are sufficiently screened following the standard procedures. For this purpose it is also important to ensure that adequate capacity and resources are provided to mandated institutions to conduct the variety testing and release processes efficiently and effectively. The following actions will be taken to achieve this:

- The Government will provide adequate resources to public sector scientists and institutions undertaking variety development to enable adequate testing of new varieties.

- Institutional mechanisms will be developed for scientists, institutions and farmers to interact regularly in order to avoid wasteful duplication of efforts and direct resource investment on need-based research and other interventions.
- The unified Seed Certification Unit, to be formed out of the existing seed quality control laboratories, will have responsibility for certification of Foundation, Registered and Certified Seeds, among others.
- Externally developed crop varieties intended for introduction and commercial cultivation in Myanmar will be subjected to laid-down validation and registration processes by the National Seed-related Committee.
- DAR, in cooperation with DOA, will be authorized to test, purify, characterize and release local landraces as official varieties for which there is substantial and steady demand.

9.4 Intellectual Property Rights (IPRs) (Plant Breeders' Rights and Farmers' Rights)

Intellectual Property Rights (IPRs) for plant varieties provide a means for plant breeders (either from the public or private sector) to obtain a return on investment made in the development of new varieties. Farmers' rights are "rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources, particularly those in the centres of origin/diversity". These rights are laid out in the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) as follows: "Farmers have the right to save, exchange, sell their seed with neighbours and at local markets, to participate in national decision making process, to share the benefits from commercial use of their traditional varieties and to protect their traditional knowledge".

In providing incentives for plant breeders on one hand and farmers on the other, there is a need to balance the rights of the two groups. This can be achieved through differentiated systems of variety protection, which reflect the actual situation and needs in different crops. Commercial varieties require robust protection measures while traditional varieties and landraces need more farmers' rights provisions.

Several generations of farmers in Myanmar have traditionally saved their own seed through selection of superior material from their fields. That practice still continues under the informal seed sector whereby farmers still save their own seed and contribute at least 80% of rice seeds planted in Myanmar. By this practice farmers have contributed immensely in the development, maintenance and preservation of plant genetic resources in Myanmar.

The policy objective is to support the development and implementation of a well structured and targeted IPR legislation (PBR and Farmers' Rights) which will encourage breeders and farmers in their work to rapidly develop and release improved varieties, enhance seed accessibility and protect plant genetic products. Where variety development is a public activity, with breeders and breeding being fully funded by Government, breeders rights may not be as critical an issue as it is when there is private sector involvement in breeding. The following actions will be undertaken to implement this policy:

- In recognition of the efforts of farmers and as a reward for their role in variety development, farmers will maintain their right to use, exchange, share or sell their farm-saved seed between themselves without any restriction and will have the right to continue using any varieties of their choice without being hampered by the system of compulsory registration provided they do not commercialise production emanating from proprietary varieties.

- The Government will shortly develop innovative ways to provide incentives to all public sector breeders to motivate them in their work. Modalities for fully-fledged breeders' compensations will be entrenched in future Variety Protection Legislation to ensure that the rights of breeders are adequately protected, and to serve the private sector into research and variety development.

10. Seed Marketing and Distribution

Seed marketing forms the very core of a successful seed industry. Marketing links up producers with the users of the seed through a continuum of intermediaries. Formal seed marketing is relatively underdeveloped in Myanmar, leaving the informal sector as the main source of seeds for farmers. Seed demand is critical in establishing a formal seed industry. Efforts must therefore be made to ensure that a viable seed demand environment is created as a basis for the establishment and growth of the private sector and these efforts must involve all stakeholders.

The policy objective is to develop adequate marketing systems that will create satisfactory seed demand and adequate and timely supply of the required range of varieties of desired quality, at reasonable prices and at locations accessible to farmers. To achieve this, the following actions will be undertaken:

a) General

- The Government recognizes seed marketing as the main driver of growth of the seed industry and, therefore, will take necessary measures to strengthen this component.
- The Government will pursue the development of a private sector-led seed marketing and distribution system taking into account the presence of the drive and skills in this sector to lead in seed marketing.
- The MOALI will work with other agencies to ensure that public sector infrastructure projects take into account building transportation and communication links to support efficient and safe delivery of seeds to all parts of the country.
- The Government will work with financial institutions to ensure that necessary financing is available to the private sector to enable it to develop necessary seed marketing structures.
- The Government will promote, through public-private partnerships, the establishment of adequate marketing facilities such as safe seed storages, encourage the establishment of marketing outlets near production centers and improve trust features such as seed packet labeling.
- Overall, the Government will ensure that the seed industry achieves a good balance between seed production and seed supply of the right varieties, at the right locations, when they are actually needed and at the right prices from the view point of both the producer and consumer.

b) Extension and Promotion

- The Government will assist the private sector marketing effort with appropriate extension and promotional programmes which will be aimed at enhancing farmers' seed utilization.
- The Government will allocate adequate resources to develop and maintain the national extension service, a vital link for expansion of the seed industry.
- The DOA will undertake appropriate measures to ascertain the real and effective seed replacement frequency in efforts to support the production of seed in quantities matching the real seed demand levels.

c) *Seed Industry Data*

- The office of the National Seed-related Committee will be charged with the responsibility of assembling relevant seed industry data including seed marketing data such as seed demand, agro-ecological data, sources of needed facilities and other inputs required to guide in the planning of seed industry activities

d) *Subsidies*

- Except under emergency situations when affected farmers have to be assisted, Government will not consider the institution of any seed subsidy scheme.

e) *National Seed Reserve*

- DOA and DAR will be required to establish a National Seed Reserve stock for emergency distribution of quality seeds when natural disasters occur and seed supplies in disaster-hit areas are lost. This will help reduce dependence on externally sourced seeds for post-disaster rehabilitation of crop production.
- The reserve stock will have breeder, foundation, registered and certified seed components which shall be managed differently with regard to responsibility, facilities and modalities. The size of the reserve will be based on the quantity of seeds required to meet the estimated minimum requirement for sustaining the seed industry and meeting the immediate need of certified seeds.
- The Government will seek the assistance of development partners in building specialized storage and other facilities for operation of the National Seed Reserve.
- The cost of operating the National Seed Reserve will be minimized through the institution of a revolving fund for the operations. Government will seek cost-effectiveness of the seed reserve operations through contracts with the private sector agencies, which will operate the certified seed stocks alongside their own commercial seed stocks.

11. Seed Imports

Although seed imports are minimal in Myanmar, there are two areas where seed import is important. The first is the periodic stock seed that must be imported for research and development purposes. The second is the importation of seeds of some exotic crops such as temperate vegetables that is necessary to feed the fruit and vegetables market.

The policy objective is to minimize seed imports through the strengthening of national seed production, marketing and regulatory capacities while ensuring that materials needed to be imported to support national research and seed production and for the exotic vegetable market are efficiently sourced. The following actions will be taken to implement this policy.

- All possible Government assistance shall be provided to any Government or private-sector agency which requests import clearance for research and exotic vegetable seed.
- All import seeds for production, except for research purpose, without regarding the amount of seed lot should enter to the Variety Registration under NSC as for a new variety to Myanmar before its commercial production and distribution.

12. Seed Exports

Seed export assumes importance when it becomes an avenue for the sale of surpluses. Even when surpluses do not exist, seed companies can exploit niche markets for exporting seeds that do not pose problems for the local industry. Due to the high levels of regulations in the international seed market, export successes invariably imply a good level of creditability in the local seed industry. While seed exports are not significant at this time, Myanmar's rich agro-ecological diversity places the country in an advantageous position to develop a seed export capability in the near future. The following action will be taken to promote seed exports:

- The Government will support any private sector initiative that seeks to exploit the seed export potential provided the effort does not conflict with the local availability and affordability of improved seeds.

13. Seed Sector Development

Despite considerable successes achieved in the past, the seed sector needs more investment and more focused efforts that would upgrade it to a level to adequately support sustained development of the country's agriculture sector.

While the public sector is poised to play the key role through research, extension and regulatory services, more efforts are needed to support private sector development to enable it to play a complementary role, concentrating particularly on those areas that have potential for commercialization. Additionally, a properly developed private sector can partner government in the provision of some of the services, notably research and extension.

The policy objective is to build adequate administrative oversight and institutional structure for directing the development of the seed sector through facilitation, promotion and provision of incentives. The expected outcome is mass utilization of quality seeds towards enhancing the status of the private seed sector as the main conduit for commercial seed business. In order to achieve this policy objective, the government will undertake the following measures:

a) The Role of the National Seed-related Committee

- The Government recognizes the crucial importance of continuous public sector assistance for private sector seed enterprise development. Such assistance will be provided through the National Seed-related Committee and the Seed Division of DOA.

b) Private Sector Promotional Benefits

- The Government will encourage the private sector to take a leadership role in seed production and supply, and will provide all possible support to it, as specified in this policy or established in ensuing supportive protocols, upon the advice of the National Seed-related Committee.
- The Government will provide adequate incentives to expedite private sector entry into the seed business. Incentives may include provision of low-interest credit to establish seed processing facilities, consideration of tax holidays and reduced taxes on imported seed processing and handling machineries and equipment, etc.
- The Agricultural Extension Division of DOA will be provided with adequate resources for training farmers on the use of quality seeds of improved varieties and conducting other seed use promotional programmes that will boost the seed demand and help expand the seed industry through attracting private sector investment.

c) *The Informal Seed Sector*

- The Government recognizes that the informal sector continues to supply the bulk of the seeds that farmers use for planting. Government's assistance will be directed to helping relevant informal sector participants to progress into the formal sector domain to contribute to the expansion of the formal sector seed industry, in terms of both seed utilization and supply.

d) *Prices of Farm Outputs*

- The Government realizes that farmers will opt for purchased inputs including quality seeds only when they see their net incomes increasing from investment in farming. Government will, therefore, undertake appropriate measures to ensure that farmers get reasonable returns when they sell their produce.

e) *Availability of Related Farm Inputs*

- The Government will continue to provide various incentives and concessions to increase the availability of fertilizers and other farm inputs that help maximize achievable yields and thus enhance farm productivity.

14. Capacity Building

Institutional capacity building including trained human resources and development of physical facilities are critical for the development of the seed industry. It remains important throughout the seed value chain from variety development and release, seed production and seed quality assurance to seed marketing, seed extension and seed security management.

The presence of a stable cadre of subject matter expertise is critical and, therefore, there is the need to train scientists, breeders, technical and field staff. Inadequate facilities exist in Myanmar for the training of scientists in some special skills and therefore such trainings have to be arranged externally.

The policy objective is to identify the infrastructural, institutional and human resource development that will be necessary to implement a comprehensive seed industry and to act in concert with all stakeholders to ensure that the required capacities exist throughout the seed industry for orderly and balanced growth of the industry. The following actions will be taken to pursue this objective:

- The Government will continue to invest in strengthening institutional capability of public sector institutions engaged in the seed industry. Such investment will be directed at upgrading infrastructure (vehicles, buildings, laboratory and seed plant equipment, supplies) and training human resources.
- The Government will require that agricultural educational institutions, both academic and vocational, take appropriate measures for including important seed industry modules into their curricula to provide the graduates with a clearer understanding of seeds in the context of plant breeding, seed technology, input supply and agribusiness.
- The Government will place particular emphasis on the training of extension staff and input dealers in the proper means of communication with farmers to ensure proper technology transfer and awareness on quality seed.

15. Funding Mechanisms

Mobilization of adequate funding resources will be needed to orchestrate balanced development of the seed industry. Myanmar has already made significant investments in development of the basic

infrastructure. Therefore, further investments will largely have to do with development of the public sector capacity for efficient service provision and supporting the emerging private sector. A strong commitment to provide the needed funding from domestic resources will signal a strong sense of national ownership of development programmes in the seed sector, boost enthusiasm of stakeholders, and provide a strong impetus for development partners to commit development assistance.

The following avenues will be explored to amass the resources needed for seed sector development:

- The Government will continue to allocate a share of the national revenue through the annual budget and other fiscal actions including possibilities under existing agriculture-related schemes to generate the funding required to developing the national seed industry.
- Appropriate fees shall be charged for services such as variety registration, field inspection, seed testing and certification.
- The Government will initially support the private sector to properly develop and attain the anticipated status as the industry leader in the commercial components but with the expectation that eventually the private sector will emerge as partner with Government in providing the necessary resources required for the further growth of the seed industry.
- External funding through development assistance will be sought in implementation of capacity building projects.

16. International Cooperation

Many international development partners including research organizations have played a vital role in developing the country's seed sector through capital investment, technical assistance and capacity building. This assistance has put in place the systems for variety introduction and trial, commercial seed production, and quality control forming a sound basis for the seed sector. The main agencies in this context are as follows:

- International Agricultural Research Centres (IARCs) such as IRRI, ICRISAT, CIMMYT, CIP, etc.
- United Nations agencies such as Food and Agriculture Organization (FAO), United Nations Development Programme (UNDP)
- International Development Financing Institutions such as World Bank, ADB.
- Aid agencies of major donors such as ACIAR, JICA, KOICA, EU, etc.
- International Professional Organizations such as International Seed Federation (ISF), International Seed Testing Association (ISTA) and International Union for the Protection of New Varieties of Plants (UPOV).

The Government will take the following steps to expand the scope of international collaboration to support seed industry development:

- The Government will discuss the eventual implementation of specific segments of the seed plan with relevant associations with a view to benefitting from their specialized knowledge.
- The Government will expedite establishment of cooperation with the International Seed Testing Association (ISTA), in the expectation that ISTA can make a significant contribution to upgrading of facilities and human resources for seed certification in Myanmar. Further, when the current system has been sufficiently upgraded government will seek official accreditation to ISTA.
- The Government will aim at achieving accreditation and membership of other relevant international seed related associations at the appropriate stages in consonance with the degree

of development of the local industry, in order to derive the benefits from the contributions that these agencies can make.

17. Effective Date

The National Seed Policy shall come into effect as of August 12, 2016. The tenets of the policy shall have long-term application, and shall continue in force indefinitely, until specifically modified under provisions of this Policy. However, any such modifications shall not change the intent or philosophy of this National Seed Policy.

ISSUED this on August 12, 2016

Aung Thu
Union Minister for the Ministry of Agriculture, Livestock and Irrigation
The Republic of the Union of Myanmar

List of Priority Crops

Cereals	Food Legumes	Root and Tuber crops	Oil Seed Crops	Horticultural Crops (Fruits)	Horticultural Crops (Vegetables)	Industrial Crops
Rice	Black gram	Cassava	Groundnut	Mango	Hot pepper	Cotton
Maize	Green gram	Sweet potato	Sunflower	Banana	Tomato	Sugarcane
	Chick pea	Yam	Sesame	Papaya	Onion	Rubber
	Pigeon pea	Taro		Pineapple	Cucumber	Oil Palm
		Potato		Watermelon		Coffee
				Musk melon		Jute
						Kenaf