



Prospects for Scaling Up Crop Breeding Capacities of Seed Clubs in Vietnam

Dr. Huynh Quang Tin • Normita G. Ignacio • Norminda P. Naluz • Cid Ryan P. Manalo



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*"Our dream is to
continue contributing to
the food and livelihood
security in Vietnam"*

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Ultimately, foundational to this publication and all our activities is the tireless work of our farmer partners. Our continuous, long-term partnership built on mutual trust and respect, through the cooperation of various stakeholders – from the academe, the government institutions and CSOs, is a testament that sustainable and resilient seed systems is possible. May we all continue to put the needs of farmers

and the most vulnerable populations at the driving seat of all our future undertakings.

Our dream is to continue contributing to the food and livelihood security in Vietnam, putting emphasis on conservation of agricultural biodiversity, climate change adaptation, respect of traditions and practices of our smallholder farmers, through empowering and participative mechanisms.

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It implements projects in partnership with government agencies, civil society organizations, academic institutions, and local government units in Bhutan, Cambodia, Lao PDR, Myanmar, the Philippines, Thailand, Viet Nam, and Timor Leste. SEARICE is registered with the Philippines' Securities and Exchange Commission (SEC) as a non-stock and non-profit organization based in the Philippines.

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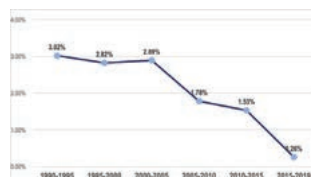
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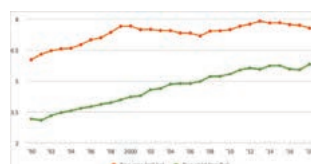
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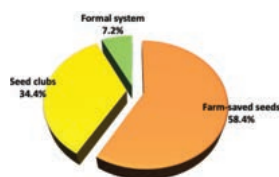
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Cost of plant variety protection in Vietnam

| | VND | USD |
|---------------------------------|----------------|--------|
| Application Fee | | |
| a. First Application | 2,000,000 | 87 |
| b. Re-application | 1,000,000 | 43.5 |
| Technical Testing Fee | | |
| a. DUS test for seasonal crops | 8,300,000 | 360.9 |
| b. DUS test for yearly crops | 11,000,000 | 478.3 |
| c. DUS test for perennial crops | 24,000,000 | 1043.5 |
| d. Breeder conducts DUS test | 50% of the fee | |

List of Acronyms

| | |
|------------|---|
| AGI | Agricultural Genetics Institute |
| CBDC-BUCAP | Community Biodiversity Development and Conservation - Biodiversity Use and Conservation in Asia Program |
| CLRRI | Cuu Long Rice Research Institute |
| DARD | Department of Agriculture and Rural Development |
| DUS | Distinctness, Uniformity and Stability |
| EDV | Essentially Derived Varieties |
| FAO | Food and Agriculture Organization |
| FCRI | Food Crops Research Institute |
| FFS | Farmer Field School |
| FGD | Focus Group Discussion |
| IAS | Institute of Agricultural Sciences |
| KII | Key Informant Interview |
| MARD | Ministry of Agriculture and Rural Development |
| MDI-CTU | Mekong Delta Development Research Institute- Can Tho University |
| MRI | Maize Research Institute |
| NCVESC | National Centre for Seed Evaluation and Seed Certification |
| NIPP | National Institute for Plant Protection |
| NISF | National Institute for Soils and Fertilizers |
| PBR | Plant Breeders' Rights |
| PGR-CDU | Plant Genetic Resource Conservation, Development, and Utilization |
| PGRCI | Plant Genetic Resources Conservation Initiative |
| PGRFA | Plant Genetic Resources for Food and Agriculture |
| PPB | Participatory Plant Breeding |
| PRC | Plant Resources Center |
| PVP | Plant Variety Protection |
| PVPO | Plant Variety Protection Office |
| RDI | Research and Development Institute |
| SEARICE | Southeast Asia Regional Initiatives for Community Empowerment |
| SSC | Southern Seed Company |
| UNDROP | United Nations Declaration on the Rights of Peasants |
| UPOV | Union for the Protection of New Varieties of Plants |
| VCU | Value for Cultivation and Use |
| VNUA | Vietnam National University of Agriculture |

Executive Summary

The rise of Vietnam from a very poor nation into a lower middle-income country is credited to the opening of its economy in the 1980s. The Doi Moi policy (economic rejuvenation), launched in 1986, transformed the country's command economy to a socialist-oriented market economy where the private sector began to play a more significant role. Doi Moi introduced free-market economic reforms that spurred the growth of key sectors such as agriculture. Among the reforms introduced were on decollectivised agricultural lands, enhancement in science and technology, investments in infrastructure such as irrigation and roads, strong push for mechanized farming, and crop improvement and breeding.

Particular to crop improvement and breeding, there are several major actors involved in the seed sector which has two systems: formal and informal. The formal seed system is comprised of government institutions (gene banks, research institutions, academic institutions, and seed centres) and private entities (large private seed companies, farmers' cooperatives, and farmers' seed companies). Under the informal or farmers' seed system are farmers who practice the traditional way of using farm-saved materials, sharing, exchanging, and selling of seeds with other farmers. The farmers' seed system in Vietnam also includes seed clubs.

This paper examines how seed clubs can contribute in the further development of the seed sector and in enhancing agricultural productivity in the country. Seed clubs were borne out of SEARICE's work on participatory plant breeding with the Mekong Delta Development Research Institute-Can Tho University (MDI-CTU) in the Mekong Delta. These seed clubs, currently numbering 325, operate in 13 provinces where they provide good quality, locally adapted seeds that are affordably priced. Farmer-breeders in these seed clubs have developed over 360 rice varieties, demonstrating their capacity in seed breeding and production.

However, the current nature of Vietnam's agriculture is more favorable to the private sector which dominates production and distribution activities and fulfills Vietnam's market-oriented initiatives. Farmers are faced with policies and laws that limit their full participation in seed breeding and production activities. Among the impediments is the Seed Ordinance which prohibits the selling of uncertified seeds. The seed registration and certification process that farmers must go through to be able to sell their seeds on a large scale is unnecessarily rigid, even in the view of the public plant breeders that were interviewed for this study. Another legislation which was meant to encourage innovation among plant breeders is the Plant Variety Protection

(PVP) Law. In reality, it gives plant breeders (who can afford the cost of varietal protection) more monopoly rights over the varieties they develop and unduly restricts the farmers' seed system and farmers' rights. The intention of the law is good, but the impact is damaging especially to smallholder farmers because they cannot multiply and sell seeds of protected varieties. This restriction also impedes their capacities on selection breeding and seed production.

Seed clubs and their farmer-breeders have huge potential to fill the gap in the seed supply and cutting them off from the system is proving to be counterproductive. In addition to loss of income opportunities, the potential contribution of seed clubs to agricultural biodiversity, as well as provision of diverse choices of locally adapted and affordable seeds to other farmers are curtailed. The formal and farmers' seed systems are complementary and should co-exist for the country's seed systems to function most effectively and efficiently.

A more inclusive seed sector in Vietnam where seed clubs and farmers can fully participate will significantly contribute in the country's agricultural development. To help create this enabling environment, the authors recommend the following: 1) the farmers' seed system needs to be supported with policies that will allow it a fair opportunity to contribute to the needs especially of smallholder farmers with minimal resources, which includes a different, streamlined registration and certification process appropriate to their

situation and farmer-bred varieties; 2) small enterprises and farmers' networks need to be given support for them to continue with their operations and adequately serve their members and clients; 3) create a system of rewards and incentives more suited for public researches and breeders – other than financial incentives, they have to be given proper recognition for their efforts and accomplishments (e.g., opportunities for advanced training or studying abroad, conducive environment to engage in collaborative R&D/breeding projects with international and other local organizations); and 4) amend several provisions of the PVP Law for them to be better suited to the prevailing conditions in Vietnam (e.g., make accommodations for farmers' traditional practices and inherent rights in saving/exchanging/selling seeds, measures to avoid misappropriation of farmer-bred varieties, among others).

Ultimately, research and breeding activities by smallholder farmers should be supported for the development of varieties that will not be cuffed with plant breeder's rights. These varieties should remain unprotected such that they can be multiplied and distributed much more freely by seed clubs, seed centres, and small seed companies. A sui generis PVP law should be supportive of farmers' rights, including the right to save, exchange and sell seeds. Measures to avoid misappropriation of farmer-bred varieties should be put in place.

RUỘNG NHÂN GIỐNG

NV1

I. Introduction

*“farmers became
more involved in
SEARICE’s
project implementation
in order to enhance
their crop breeding skills.”*

In the Mekong Delta where half of the country’s rice production is concentrated, most seed breeding is done by small farmers.¹ SEARICE has been assisting smallholder farmers in Vietnam since its first collaboration with MDI-CTU on a program called Plant Genetic Resources Conservation Initiative (PGRCI) from 1991-1995. The program focused on the collection of varieties of rice and root crops in an attempt to conserve valuable plant genetic resources; on-farm trials for varietal evaluation were conducted to promote the utilisation of promising, locally preferred varieties. In succeeding years, farmers became more involved in SEARICE’s project implementation in order to enhance their crop breeding skills. The organization implemented initiatives that enabled farmers to develop rice varieties that suit their own needs for their local conditions. These efforts have given birth to 325 seed clubs – farmer-managed groups that breed and select varieties for local communities which are operating in 13 provinces in the Mekong Delta (SEARICE 2019).

These seed clubs have an integral function in the farmers’ seed system in the delta and even beyond the region by providing much needed good quality and locally adapted seeds at affordable costs. In a study done on the socio-economic

¹ GRAIN, “Asia under threat of UPOV 91”, 3 December 2019. <https://www.grain.org/en/article/6372-asia-under-threat-of-upov-91>

impacts of participatory plant breeding, farmers ranked community seed clubs the highest when it came to seed quality (De 2005). Because of increasing production, some seed clubs such as the Vin Trach Seed Club in An Giang, My Lam Seed Club in Kien Giang, and Long An Seed Club in Vinh Long have established networks with seed clubs in other provinces to supply quality seeds in communities where demand is high.²

Farmer-breeders belonging to these seed clubs are also contributing to varietal development. They have developed more than 360 varieties, five of which are already nationally certified while four others are undergoing various stages in the registration and certification process.³ These farmers' varieties are not only a major

contribution to the seed supply in the Mekong Delta, but also to the country's agricultural biodiversity.

Seed clubs have untapped capacities to contribute to Vietnam's agricultural productivity especially in the face of increasing threats of disasters and risks in livelihood and food security. They serve a special market niche – smallholder farmers who cannot afford to access seeds from the formal sector, especially the large seed companies. Seed clubs would be better able to do this if they could scale up their operations in communities outside their own provinces and expand their crop breeding and production activities in crops other than rice.

² Tin, Huynh Quang, et al., *Securing the Local Seed Systems: The Journey of Farmers' Seed Clubs in Vietnam* (Philippines, SEARICE, 2019).

³ *Ibid.*, pp 20-21

Objectives

This paper examines how seed clubs can contribute in the further development of the seed sector and in the productivity of agriculture in Vietnam. In particular, it looks into the current landscape of agriculture, the major actors in the seed sector, and the constraints faced by seed clubs in scaling up their capacities on crop improvement, plant breeding, and seed production. Finally, the paper provides recommendations for an inclusive system where seed clubs can fully participate in the country's seed sector.

Methodology

Data used for this study were derived from primary and secondary sources. Primary data were collected from 15-27 September 2019. With the assistance of SEARICE provincial partners, data were collected through key informant interviews (KIIs) and focus group discussions (FGDs) with a total of 42 participants from government agencies which included the Plant Variety Protection Office (PVPO) and Provincial Seed Centres and Extension Centres; formal plant breeding institutions from national and sub-national agricultural research centres, academic institutions; private seed companies (large and small scale); and farmer-partners of SEARICE (members of seed clubs and seed cooperatives).

Secondary data were derived from a review of literature on Vietnam's agricultural policies and ordinances, including studies done on the country's agricultural productivity, especially on the rice sector.



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Chúc Mừng Năm Mới



II. Agricultural development and the seed sector

Contributing factors in the economic growth of Vietnam

“The shift to multiple cropping within the rice production system further boosted Vietnam’s agricultural development.”

The impressive economic growth of Vietnam can be traced to the period when it opened its doors to the private sector’s

were also granted to individual households and gave farmers control to develop and manage their own farms.⁵ More rights were granted under Decree No. 64-CP, dated 27 September 1993, which allocated land to households and individuals for stable and long term use for agricultural purposes.⁶

Breeders from the Food Crops Research Institute (FCRI) recalled that the land used for farming greatly increased from only four million (M) hectares (ha) in 2000 to about 7.5 M ha after 20 years. Land consolidation was also allowed by combining farms to increase farm yield. Farmers can do this by buying land or entering into an arrangement with another family to consolidate their farms. Under the 2014 Decree No.43/2014/ND-CP on land consolidation policy, farmers were further allowed to exchange land with other farmers (even if the plots are not adjacent) or sell their land in order to be able to buy adjacent plots. Farmers can seek the government’s assistance in the negotiations.

Dr. Nguyen Tri Hoan of FCRI commented that this policy on land consolidation has increased and improved the quality and quantity of farmers’ yield. However, Dr. Pham Hung Cuong of the Plant Resources Center (PRC) shared that one factor that contributed to land consolidation is the increasing industrialization which drives the

greater participation in developing the country’s economy. The launching of the Doi Moi in 1986 introduced free-market economic reforms that catalysed the growth of key sectors such as agriculture. Doi Moi shifted the agricultural production system from a centralised, collective model to private ownership of land. Reforms that were enshrined in the 1993 land law guaranteed individual farmers with five crucial rights over their lands: exchange, mortgage, transfer, rent, and inheritance. Along with giving households greater security of tenure over their farmlands, spelling out their rights have been credited with increasing agricultural production.

Beginning with the passing of Resolution 10 NQ/TW which decollectivised agricultural land in 1988,⁴ land use rights

⁴ Do, Quy-Toan & Iyer, Lakshmi. (2008). *Land Titling and Rural Transition in Vietnam. Economic Development and Cultural Change*. 56. 531-579. 10.1086/533549.

⁵ Based on FGD with Vietnam National University of Agriculture (VNUA)

⁶ <https://vanbanphapluat.co/64-cp>

younger generation to seek work in other sectors. With less able-bodied family members to work in the farm, some households are renting out or selling off portions of their land to their neighbors.

Enhancement in science and technology greatly benefitted research and development institutions (RDIs). An increase in international collaboration with other institutions and researchers led to scientific development, knowledge building, and upgraded the technical skills of breeders and researchers. With the decentralisation of control to the scientists, RDIs and other relevant organizations enabled them to draft their own plans, conduct monitoring and evaluation, and make decisions based on their expertise; these changes were likewise considered as having contributed to the development of agricultural research.⁷ The growth in scientific knowledge and capacities, coupled with strong government support for the agricultural sector significantly contributed to the advancement of the country's R&D programs. Where information and research used to focus only on a handful of crops, now the number of crops under study is growing such that new divisions for each crop are being created.

The increased investments on infrastructure greatly enhanced irrigation systems, roads, farm machinery, and other facilities that are essential in crop production. Improvements in irrigation benefitted not only rice but all other food crops. The FGD participants from FCRI estimated that about 80% to 90% of agricultural fields in the country are now

irrigated. For all of Vietnam, resources were also poured in farm mechanization, in the North and South alike.

Mr. Nguyen Van Thang from FCRI recalled that in the 1980s, Vietnam lacked food and many people went hungry, thus they worked on increasing rice production for domestic use. When food security was attained by 2005,⁸ the government then realized the importance of market expansion and thus made it the focus of crop improvement and plant breeding. Researchers began exploring development of other crops like mango and banana, even flowers.

The shift to multiple cropping within the rice production system further boosted Vietnam's agricultural development. In the northern regions, the number of crops per year increased from two crops (winter-spring rice and autumn rice) to three crops (winter-spring rice, autumn rice, and a winter crop). In the south, the traditional single rice crop per year was replaced by three rice crops, or two rice crops plus a winter crop. In both instances, increased cropping has rapidly expanded production.⁹ When the significant improvement in yield was achieved, other characteristics which are desired by the market (i.e., consumers) were developed using both local and foreign plant materials to create new varieties. Technological innovation played an important role such as the development of cropping systems, crop rotation, intercropping, better safety in the whole production process (especially as it pertains to chemical use), and plant breeding.¹⁰

⁷ Based on FGD with Agricultural Genetics Institute (AGI)

⁸ Based on FGD with VNUA

⁹ Dung, Nguyen Mau. 2014. *The seed industry in Vietnam*. ReSAKSS Policy Note 17. Washington, D.C.: International Food Policy Research Institute (IFPRI). <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/128883>

¹⁰ Based on FGD with FCRI

Increased yields with crop improvement and plant breeding

“the steady improvement in rice yields has been quite impressive.”

Crop improvement through plant breeding is one area where Vietnam has heavily invested resources to achieve food security and eventually become competitive in the global market. The country has 18 research institutions and six universities conducting seed research, including breeding. In Southern Vietnam, the steady improvement in rice yields has been quite impressive. An analysis made by the Australian Center for International Agricultural Research (ACIAR) shows that rice yields in Southern Vietnam increased by 28% between 1985 and 2009 as a result of rice varietal improvement. Most of those yield gains were achieved by 2003 when the increase had reached a high 24% as seen in Figure 1.

During the 1980s, the varieties released had yields of 3.5–4.5 tons/hectare (t/ha); in the 1990s, 4.0–5.0 t/ha; while since 2000, rice yields have plateaued between 4.5 and 5.0 t/ha. Although some varieties grown for their special characteristics have lower yields than the earlier releases (where the main concern was high yield), these gains nevertheless clearly demonstrate the progress made by the rice breeders.¹¹ This was supported by data from the Ministry of Agriculture and Rural Development (MARD) which shows that the huge yield improvements were observed from 1995 to 2015 (Figure 2), with a sharp increase observed during the 1995–2000 period. However, Figure 1 also shows a decreasing trend in the rate of yield growth during the periods 2001–2005 and 2011–2015 which was reportedly due to the low levels of investments in rice research.¹² And as previously mentioned, researchers shifted some of their focus to breeding for other desired traits after they attained record yield increases with the new varieties that they developed.

¹¹ Brennan, J.P and Arlene Malabayabas. 2011. *International Rice Research Institute's contribution to rice variety yield improvement in Southeast Asia*. ACIAR Impact Assessment Series 74.
<https://aciar.gov.au/publication/technical-publications/international-rice-research-institutes-contribution-rice-varietal-yield-improvement>

¹² Nguyen Tri Hoan. 2017. *Vietnam's sixty-year experience in rice production. Paper presented at the special session of the "Asian Rice Economics: Country Experiences and Challenges Ahead" as part of the Centenary Annual Conference of India Economic Association*

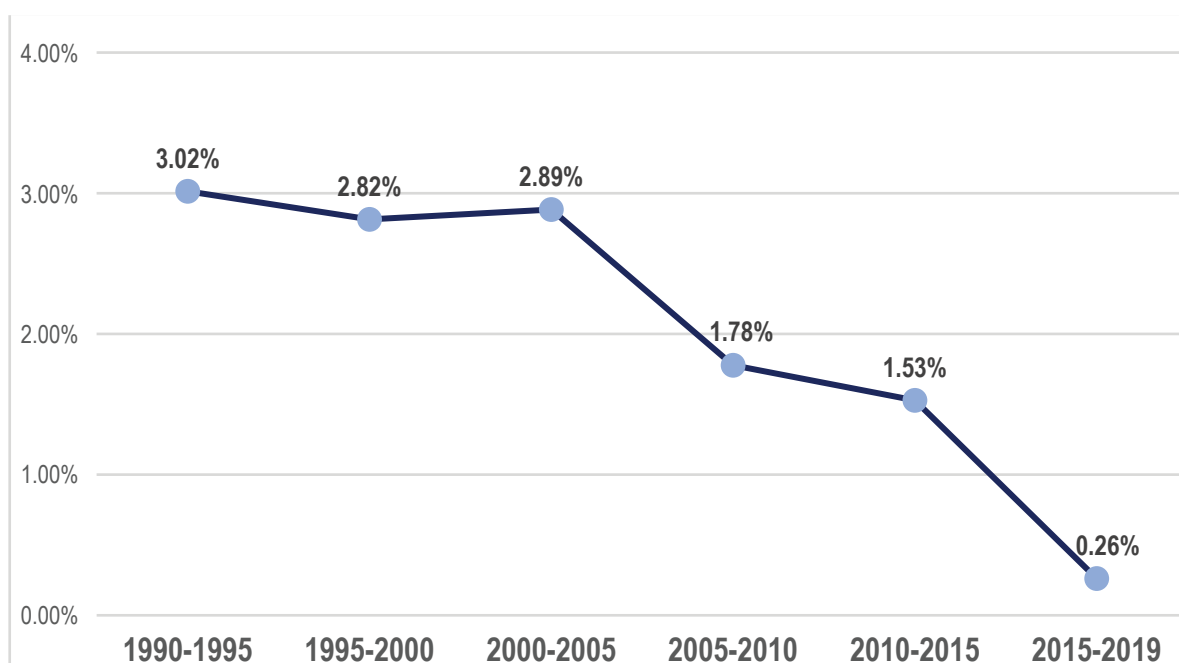


Figure 1. Average growth rate of rice yields in Vietnam over different periods

Source: General Statistic Organization (GSO), 2020. No. 6 - Statistic data: Agriculture, Forestry and Fishery Section (Tổng cục Thống kê (thongke.gov.vn))

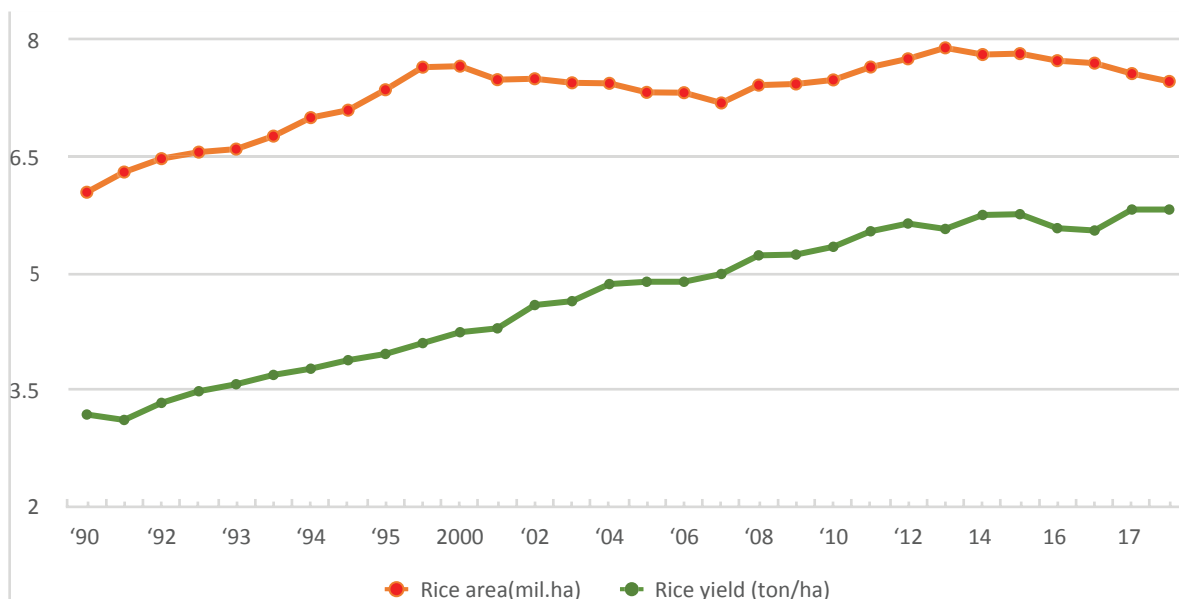


Figure 2. Rice area and yield per annum 1995-2019

Source: General Statistic Organization (GSO), 2020. No. 6 - Statistic data: Agriculture, Forestry and Fishery Section (Tổng cục Thống kê (thongke.gov.vn))

All these government interventions resulted in the overall outstanding performance of the agriculture and the seed sectors over the recent decades. For instance, agriculture and fisheries have recorded sustained growth of 3% to 4% over the period 1990-2010. The rice and aquaculture subsectors have been particularly successful,¹³ with paddy production almost doubling from 19.2 M tons to nearly 40 M tons for the same period.¹⁴

The strategic move of the government to allocate most of its public investment to agricultural research and extension, irrigation and infrastructure, and

agricultural input production facilities in the 1980s paved the way for Vietnam's transition from a food insecure country to one of the top food exporting nations in the world. The country transformed from being a net food importer to one of the top suppliers of several agricultural products, as the government encouraged farmers to grow crops for export. Vietnam ranks as the world's first in cashew and (black/white) pepper exports, second in coffee (next to Brazil), and third in rice (behind India and Thailand). From the early 2010s, Vietnam has also shown a strong performance in exporting fruits and vegetables, penetrating even the high standard markets.¹⁵

With the advances also come threats

However, the agricultural advances are still leaving smallholder farmers behind. While Vietnam's agriculture sector has made excellent progress in terms of productivity, output and exports, the rapid economic growth came with huge social and environmental costs. Resource use inefficiency and unsustainability, farmer welfare losses, and poor quality and unsafe foods (chemical-laden agricultural products)

are just a few of the problems that sprouted from such growth. The largest beneficiaries of the sector's development were neither the farmers nor the domestic consumers, but foreign consumers and large multinational agricultural corporations that benefited from low labor costs and lax environmental regulations. Consequently, this resource-exploitative agriculture has widened the income gap between farm and

¹³ JICA Centennial Group International 2013. *Agricultural Transformation & Food Security 2040. ASEAN region with a focus on Vietnam, Indonesia and the Philippines: Vietnam Country Report*

¹⁴ Jaffee, Steven & Tuan, Nguyen Do Anh & Que, Nguyen Ngoc & Anh, Dao The & Dzung, Nguyen The & Mai, Nguyen Ngoc & Nguyen, Vu & Phong, Nguyen Anh, 2011. "Moving the Goal Posts: Vietnam's Evolving Rice Balance and Other Food Security Considerations," 2011 ASAE 7th International Conference, October 13-15, Hanoi, Vietnam 290670, Asian Society of Agricultural Economists (ASAE).

¹⁵ Compiled from the Vietnam News and Hanoi Times, latest statistics from GSO, FAO's 2018, International Trade Center's 2019 and World Bank - World Integrated Trade Solutions' 2019 figures. Also see 2018: Vietnam's agriculture growth hits record high in seven years. <https://en.nhandan.org.vn/business/item/7035502-2018-vietnam%E2%80%99s-agriculture-growth-hits-record-high-in-seven-years.html>; and Vietnam's agricultural exports decline in May due to COVID-19. <https://www.mard.gov.vn/en/Pages/vietnam%E2%80%99s-agricultural-exports-decline-in-may-due-to-covid-19.aspx>

non-farm sectors and within rural areas. Concerns about food safety and environmental degradation in Vietnam also started to emerge.¹⁶

One of the biggest threats to smallholder farmers and agricultural biodiversity is the protection of new varieties. On 29 November 2005, Vietnam enacted its Intellectual Property Law (IP Law No. 50) which entered into force on 1 July 2006, recognizing and awarding intellectual property rights to plant breeders as a form of incentive to encourage the development of crop varieties. Plant breeders may be persons or organizations from Vietnam or foreign countries who have bred or developed a new variety, or have invested in breeding and development of a new variety. The enactment of the IP Law paved the way for the country's membership to the International Union for the Protection of New Varieties of Plants (UPOV).

According to Dr. Le Quy Kha of the Institute of Agricultural Sciences (IAS) for Southern Vietnam, significant improvements in plant breeding activities on key crops such as cashew, black pepper, and some upland crops were due largely to the government's support, especially in funding. The government provides such support because there is a good market for those crops, which means they can easily sell new varieties that are developed. Dr. Le Quy Kha added that funding for crops that are not highly marketable needs to be sourced elsewhere. While there are huge

financial gains from marketing new varieties of key crops, diversity is compromised as the range of crops becomes narrower. The PVP Law sometimes becomes a challenge because the benefits are limiting rather than encouraging. PVP may be helpful in assisting and compensating plant breeders in the private sector, and the funds gained from the selling of rights may find use when reinvested in similar activities. On the other hand, public research institutions and breeders do not see much value in it since they are not engaged in seed production and distribution where most income from protected varieties can be realized.¹⁷


The decision on which varieties to protect largely depends on the dictates of the market. According to the breeders that were interviewed, the required processes and fees for protection are worth the effort only if the varieties to be protected have high market demand. Protection establishes ownership but it requires distinct, uniform, stable (DUS) testing among many other technical tests. This is one area where multinational and transnational companies have undue advantage over government research institutions as the former have more established sites for testing which makes it easier for them to comply with all the testing requirements. In addition, big companies can better afford to hire researchers and breeders with more expertise and experience compared to public research and breeding institutions.

¹⁶ Nguyen Van Giap. 2019. *Vietnam's agricultural sector at a crossroads*.
<https://www.eastasiasforum.org/2019/11/28/vietnams-agricultural-sector-at-a-crossroads/>

¹⁷ Based on FGD with the Institute of Agricultural Sciences (IAS)

**PARTICIPATORY PLANT BREEDING (PPB) PROGRAM
IN THE MEKONG DELTA, VIETNAM**

**FARMER'S RICE VARIETY
TAN CHAU 1 (TC7)**



Mr. HOA SY HIEN
Date of birth: 1958
Address: Tan An, Tan Chau, An Giang
Participation in PPB project: Since 2002
Achievement: Released 37 rice varieties
Seed certification: TC7 (2019)

| Activity | Process of selection | Crop season |
|---|--|---|
| Cross | TC10/OM4900 F1 (SHHNS-A1) F2 (SHHNS-A1-2-1) F3 (SHHNS-A1-2-1-1) F4 (SHHNS-A1-2-1-1-1) F5 (SHHNS-A1-2-1-1-1-1) | HT 2007 DX 2007-2008 HT 2008 DX 2008-2009 HT 2009 DX 2009-2010 |
| Primary observation and new variety release (TC7) | | DX 2010-2011 |
| Late observation trial | | HT 2014 |
| Yield comparison trial | | TD 2014 |
| Testing for Value, Cultivation and Use (VCU) | | DX 12-13, DX 13-14, HT 16, |
| Production testing | | 2014 - Nay |

HT: Summer-Autumn, DX: Winter-Spring

Main characteristics of Tan Chau 7 (TC7):

| | |
|----------------------------|-------------------------|
| Growth cycle (day): | 100-105 |
| Plant height (cm): | 95-100 |
| Weight of 1000 grains (g): | 26-27 |
| Grain yield (t/ha): | 7-8 |
| Grain quality: | Long and non-chalkiness |
| Amylose content (%): | 21 |
| Protein content (%): | 6.3 |
| Resistance to: | Blast disease |
| Adapted with: | Salinity soil |

Tan Chau 7 (TC7) variety was certified by the Ministry of Agriculture and Rural Development (MARD) for production testing in the Mekong Delta, Vietnam on 11 January 2019 (Decision No: 10 QD-TT-VPPN).

**PARTICIPATORY PLANT BREEDING (PPB) PROGRAM
IN THE MEKONG DELTA, VIETNAM**

**FARMER'S RICE VARIETY
AN GIANG 1 (AG1)**



Mr. TRAN THANH HUNG
Date of birth: 1956
Address: Nui Voi, Tinh Bien, An Giang
Participation in PPB project: Since 2002
Achievement: Released 21 rice varieties
Seed certification: NV1 (2012 and AG1 (2019)

| Activity | Process of selection | Crop season |
|--|--|--|
| Cross | OM6912/HD1 F1 (T29-7-3) F2 (T29-7-3-2) F3 (T29-7-3-2-2B) F4 (T29-7-3-2-2B-1) F5 (T29-7-3-2-2B-1-1) F6 (T29-7-3-2-2B-1-1-1) | HT 2010 DX 2010-2011 HT 2011 DX 2011-2012 HT 2012 DX 2012-2013 HT 2013 |
| Primary observation and new variety release (AG1) | | DX 2013-2014 |
| Late observation trial | | HT 2014 |
| Yield comparison trial | | TD 2014 |
| Testing for Value, Cultivation and Use (VCU) | | DX 14-15, HT 15, DX 15-16 |
| Testing for Distinctness, Uniformity and Stability (DUS) | | HT 2016, HT 2017 |
| Production testing | | 2014 - up to date |

HT: Summer-Autumn, DX: Winter-Spring

Main characteristics of An Giang 1 (AG1):

| | |
|----------------------------|---------------------------------|
| Growth cycle (day): | 95-97 |
| Plant height (cm): | 90-95 |
| Weight of 1000 grains (g): | 25-26 |
| Grain yield (t/ha): | 7-8 |
| Eating quality: | Soft, aroma |
| Amylose content (%): | 14.6 |
| Protein content (%): | 8.7 |
| Blast disease (scale): | 1-3 |
| Adapted with: | Acid sulfate and salinity soils |

An Giang 1 (AG1) variety was certified by the Ministry of Agriculture and Rural Development (MARD) for production testing in the Mekong Delta, Vietnam on 11 January 2019 (Decision No: 10 QD-TT-VPPN).

**PARTICIPATORY PLANT BREEDING (PPB) PROGRAM
IN THE MEKONG DELTA, VIETNAM**

**FARMER'S RICE VARIETY
HON DAT 1 (HD1)**



Mr. NGUYEN VAN TINH
Date of birth: 1962
Address: My Lam, Hon Dat, Kien Giang
Participation in PPB project: Since 2002
Achievement: Released 36 rice varieties
Seed certification: HD1 (2010)

| Activity | Process of selection | Crop season |
|--|---|---|
| Cross | AS996/MTL156/Nang Nham F1 (L340-2) F2 (L340-2-1) F3 (L340-2-1-1) F4 (L340-2-1-1-1) F5 (L340-2-1-1-1-1) | DX 2001-2002 HT 2002 DX 2002-2003 HT 2003 DX 2003-2004 HT 2004 |
| Primary observation and new variety release (HD1) | | DX 2004-2005 |
| Late observation trial | | HT 2005 |
| Yield comparison trial | | DX 2005-2006 |
| Testing for Value, Cultivation and Use (VCU) | | DX 06-07, HT 2007 DX 07-08 |
| Testing for Distinctness, Uniformity and Stability (DUS) | | HT 2008, HT 2009 |
| Production testing | | 2005 |

HT: Summer-Autumn, DX: Winter-Spring

Main characteristics of Hon Dat 1 (HD1):

| | |
|----------------------------|--|
| Growth cycle (day): | 95-100 |
| Plant height (cm): | 95-100 |
| Weight of 1000 grains (g): | 26-27 |
| Grain yield (t/ha): | 7-8 |
| Grain quality: | Long and non-chalkiness |
| Resistance to: | Brown plant hopper, Yellow dwarf disease |
| Adapted with: | Salinity and acid sulfate soils |

Hon Dat 1 (HD1) variety was certified by the Ministry of Agriculture and Rural Development (MARD) for rice production in the Mekong Delta, Vietnam on 23 December 2010 (Decision No: 630 QD-TT-CLT).

**PARTICIPATORY PLANT BREEDING (PPB) PROGRAM
IN THE MEKONG DELTA, VIETNAM**

**FARMER'S RICE VARIETY
LONG HO 8 (LH8)**



**Mrs. MAI BICH CHUONG
Mr. PHAM VAN LONG**
Date of birth: 1960, 1950
Address: Long An, Long Ho, Vinh Long
Participation in PPB project: Since 2006
Achievement: Released 14 rice varieties
Seed certification: LH8 (2019)

| Activity | Process of selection | Crop season |
|--|--|---|
| Cross | LH15/OM6905 F1 (LC10) F2 (LC10-1) F3 (LC10-1-1) F4 (LC10-1-1-1) F5 (LC10-1-1-1-1) F6 (LC10-1-1-1-1-1) F7 (LC10-1-1-1-1-1-1) | DX 08-09 HT 2009 DX 09-10 HT 2010 DX 10-11 HT 2011 DX 11-12 |
| Primary observation and new variety release (LH8) | | HT 2012 |
| Late observation trial | | DX 12 - 13 |
| Yield comparison trial | | HT 2013 |
| Testing for Value, Cultivation and Use (VCU) | | DX 13 - 14, HT 14, DX 14 - 15 |
| Testing for Distinctness, Uniformity and Stability (DUS) | | HT 2015, HT 2016 |
| Production testing | | 2014 - up to date |

HT: Summer-Autumn, DX: Winter-Spring

Main characteristics of Long Ho 8 (LH8):

| | |
|----------------------------|----------------------------------|
| Growth cycle (day): | 85-90 |
| Plant height (cm): | 95-100 |
| Weight of 1000 grains (g): | 25-26 |
| Grain yield (t/ha): | 7-8 |
| Grain quality: | Long grain and non-chalkiness |
| Amylose content (%): | 13.4 |
| Protein content (%): | 7.6 |
| Resistance to: | Blast disease |
| Adapted with: | Salinity and acid sulphate soils |

Long Ho 8 (LH8) variety was certified by the Ministry of Agriculture and Rural Development (MARD) for production testing in the Mekong Delta, Vietnam on 10 July 2019 (Decision No: 222 QD-TT-VPPN).

III. Major actors in the seed sector

A. The formal seed system

The term “formal seed system” refers to a seed supply system which has been set up since the 1950s to improve the quality of seeds and deliver improved and modern varieties to farmers (Almekinders and Louette 2000).¹⁸ It is a deliberately constructed and bounded system which involves a chain of activities leading to clear products: certified seed of verified varieties.¹⁹

In Vietnam, the formal seed system can be classified into government (public) and private entities. While the actors in the seed sector include regulatory bodies, financial service providers, and credit and insurance providers (Sperling et al. 2013), this paper covers only those involved in research, breeding, production, and distribution. Under the government are gene banks, research institutions, academic institutions, and seed centres. Private entities constitute of seed companies of large commercial firms and those of farmers and cooperatives.

¹⁸ Almekinders and Louette in Huynh Quang Tin, *Impacts of Farmer-Based Training in Seed Production in Vietnam* (The Netherlands. Wageningen University, 2009), 4.

¹⁹ Louwaars in Louise Sperling, et al., *Integrating Seed Systems* (Planning for Scale Brief # 3). <https://seedssystem.org/wp-content/uploads/2014/03/Integrating-Seed-Systems-.pdf>

1. Government Institutions

Gene Banks

Gene banks work with government plant breeding institutions for the improvement of varieties, collaborate with seed companies for commercial production, and provide support to researchers. They conduct plant breeding and crop improvement, and the materials produced can be accessed by public and private institutions and farmers.

The Plant Resources Centre is the headquarters of the Vietnamese Genebank

System. Smaller gene banks keeping specific crop varieties are lodged with different research institutions. The materials accessed from PRC can be used for research and commercial purposes, but either way, they must be declared in a contract. For research, the gene banks require feedback on how the seeds are used. If used for commercial purpose, an agreement on how the gene bank can benefit from the sale of the seeds is arranged.

Research Institutions

The Ministry of Agriculture and Rural Development oversees research on most grains.²⁰ The key MARD institutes in grain science are the Food Crops Research Institute (FCRI), National Institute for Plant Protection (NIPP), National Institute for Soils and Fertilizers (NISF), Vietnam Institute of Agricultural Engineering and Post-Harvest Technology (VIAEP), Institute of Agricultural Science for Southern Vietnam (IAS), Vietnam Agricultural Science Institute (VASI), Agricultural Genetics Institute (AGI), Maize Research Institute (MRI), and Cuu Long Rice Research Institute (CLRRI).²¹

Researchers and breeders decide on the crops and breeding materials to be used and determine the specific traits – qualities based on market demand – that a new variety should possess. Decisions are based on the short-, medium-, and long-term goals of their organizations. For rice, among the criteria identified by the interviewed breeders are uniqueness, aroma, taste, texture yield, milling recovery, suitability to local conditions, short duration, and resistance to pests and diseases.

²⁰ Research and development on groundnut, soybean, sunflower, and sesame is also undertaken by the Oil Plant Research Institute of the Ministry of Industry and Trade.

²¹ *Encyclopedia of Food Grains 2nd Edition. 2016. Elsevier Ltd.*

Academic Institutions

The main universities conducting research in grain science include Hanoi Agricultural University, Hanoi University of Science (also known as Hanoi College of Sciences), Nong Lam University, Hue University of Agriculture and Forestry, Thai Nguyen University, and Can Tho University. The research conducted by these universities complement the work of other government research institutes.

Seed centres provide security of seed sources for the provinces. They are the link with research institutions and universities in acquiring new varieties for adaptation tests, multiplication, and distribution to farmers. In addition, they train farmers on seed production²² and serve as the link for sharing seeds with seed clubs for seed production. Their decision on the varieties to be released depends on the direction of the Department of Agriculture and Rural Development (DARD) to ensure food security for different agro-ecological areas of the provinces and to increase production for export.

Seed centres also assist farmers in seed certification including actively seeking funding and other auxiliary services that the

latter need in the process. They conduct periodic studies on the seed sector and link the activities with the public research institutions.²³

There are also the state-owned seed enterprises, some of which started as seed centres, which are in charge of commercial strategies in selling seeds and agricultural inputs. Their decision on what varieties to release is based on the market demands. They link with the local traders and other information sources to assess seed demands for seed production.

Extension centres are not considered part of the formal seed system but they play a major role in bringing the varieties to farmers. Their main function is transfer of farming technologies and they also act as the bridge between farmers and seed centres, providing information on farmers' preferred traits of the crop varieties they want to grow.

²² SEARICE seed centre partners also provide training on participatory plant breeding (PPB) and participatory variety selection (PVS).

²³ Based on FGD with provincial seed centres in Bac Lieu, Soc Trang, and Vinh Long and Co Do Agricultural Company, a state-owned seed company

Challenges in public research

Before Vietnam joined UPOV, almost 100% of the country's seed breeding was in the hands of the public sector.²⁴ Research institutions bred new varieties which were made available through the seed centres. Farmers then could select the variety that they wanted; access was free and no one was really concerned about issues surrounding varietal protection.²⁵ But since 2006, researchers have been charging fees for the materials they develop from those accessing their varieties. While the research institutions are under the state's administration, their funds are being increasingly derived from private sources. Beginning in the 2000s, they were directed to aim for self-sufficiency in terms of financial management²⁶ as ordered under Decree 115/2005/ND-CP, which stipulates the autonomy and self-responsibility mechanism of the public science and technology (S&T) organizations.²⁷ It appears though that not all the funds raised can be used by the research institutions as there are

budget plans to be followed as laid down by Decree 16/2015 ND-CP, which specifies that there is a fixed budget for all activities and staff salaries. The government is still the final decision maker when it comes to appropriating the RDIs' budgets.

This has resulted in the public institutions needing to raise funds specifically to support their research and breeding activities. In addition to research projects financed by local and international collaborations, funds are sourced from the sale of rights to new varieties for complete ownership or the license for seed multiplication and distribution. The rights are sold to large private seed companies and thus, in deciding what varieties to breed, researchers and breeders must give considerable weight not only to what farmers need but increasingly more so to what the large seed companies would prefer to buy.

²⁴ GRAIN, 2019. <https://www.grain.org/en/article/6372-asia-under-threat-of-upov-91>

²⁵ Based on FGD with provincial seed centres in Bac Lieu, Soc Trang, and Vinh Long and Co Do Agricultural Company

²⁶ Based on FGD with breeders from Provincial Seed Centers

²⁷ Defining the Autonomy, Self-Responsibility Mechanism of Public Science and Technology Organization. <https://ap.fttc.org.tw/article/800>

Prior to the sale of the rights, breeders must apply for protection of their varieties with the MARD for sole ownership. The price is then negotiated between the institutions and the seed companies. Once rights are transferred, the new owners are free to do what they want with the varieties, even selling them in other countries in the case of foreign-owned companies. But when full ownership to a new variety is sold to a company, the variety will no longer be released to seed centres for multiplication and distribution to farmers. Only those varieties whose protection are maintained by the research or plant breeding institutions can be accessed by the seed centres through buying a license to multiply and distribute the seeds. In effect, the seed centres now have to compete with big seed companies if they want to have access to good varieties – thus the need for them to increase their resources to be able to continue serving farmers.

University researchers consider varietal protection to be burdensome and costly as there are fees paid for gaining protection, and an annual fee to maintain it. They expressed more interest in being recognized for their innovations than having sole ownership of the varieties that they develop,²⁸ and that to them, it is enough for the materials to be registered. Registration with MARD already recognises the breeder of the new variety; its distinctness has been

established through the DUS test as well as its value through the value for cultivation and use (VCU) test, making it easier for seed companies interested in buying the variety to apply for Plant Breeder's Rights (PBR). As universities and even most small companies cannot afford to pay for the protection fees, they can opt to sell their new varieties to a company after passing the DUS and VCU tests. The buyer then would be responsible for applying for PVP to have sole ownership of the variety. There are specific instances though when public breeders apply for protection out of concern that other entities, especially big companies might "steal" and misappropriate their varieties.²⁹

The Vietnam National University of Agriculture (VNUA) has sold six new maize varieties and 13 new rice varieties to companies but did not apply for protection at all because the researchers did not see any need for it and that it would have been just an additional expense for the institution. But while registration under the name of the university is enough for them, there are exceptions when there is a probability of competition with other researchers. According to Professor Tran Vau Quang of VNUA, they apply for protection when other research institutions are developing the same characteristics on the same crops that they are focusing on. They also do it when they see an obvious potential to earn large income from selling

²⁸ Based on interviews with the MDI, VNUA

²⁹ Based on FGD with the IAS

licenses to seed producers or seed companies. He added that the general practice in the university is to keep ownership of all its protected varieties and just sell licenses to companies through cooperation on seed distribution. The partner companies simply buy stock seeds from the university for multiplication.

Another major challenge for RDIs identified by Dr. Dao Minh So of IAS is the competition with large seed companies because of their advantage on well-funded research centres and related resources. There is a clear disparity in the ability to perform testing because the multinational and transnational companies have a lot more established sites for testing compared to local communities and even the public research institutions.³⁰

Another reason why breeders from government institutions are not very motivated about PVP is because a large majority of farmers, around 70%, are using farm-saved seeds and the remaining 30% buy rice seeds from commercial sources – making it difficult for them to recover their expenses for varietal protection from seed sales.³¹ If a breeder came up with a variety that does not have a potentially large market, no company will likely buy the

protection rights to it. There are 15 new varieties for legumes – soybean, mung bean, groundnut, and sesame – that have been released for production but the breeders mentioned not having received any compensation for their work on them because seed companies are not interested in these crop varieties.³²

Professor Dang Kieu Nhan of MDI mentioned that more private seed companies have been put up after the implementation of the PVP Law and the public seed centres in the Mekong Delta are being replaced or privatized. Sources said that seed centres are gearing towards becoming joint stock companies, with the state maintaining 51% ownership; some of them are even going 100% private.³³ In some of the provinces, they are being merged with agricultural extension or plant protection offices. Financial management is also being passed on to them which means they have to earn their own income, without funding or subsidy from the government.³⁴ In 2019, based on the plan of the People's Committee No. 39 on Changing the Public Organizations to Joint Stock Companies, the Hau Giang Seed Centre became a joint stock seed company.

³⁰ Based on FGD with the IAS

³¹ Based on FGD with the IAS

³² Based on FGD with the IAS

³³ Based on FGD with provincial seed centres in Bac Lieu, Soc Trang, and Vinh Long and Co Do Agricultural Company, a state-owned seed company

³⁴ Interview with Dr. Dang Kieu Nhan of MDI-CTU

Benefits and incentives

Breeding projects in public institutions generally do not get sufficient budgets. Plant breeding takes a very long time and often, it will only be by the sixth year that significant advances are realized from the activities conducted. Substantial amounts of time, effort, money, and other resources are involved, yet the funding provided is significantly less than what is needed for the entire process. Usually by the fifth or sixth year, the funds are already depleted.³⁵

As encouragement, breeders receive incentives when the varieties achieve commercial success, e.g., varietal ownership is sold at a high price. According to the plant breeders interviewed, they could get as much as 30% of the profits for themselves with their institutions getting 70% of the proceeds.³⁶ However, the institution does not have the prerogative on how to allocate its share of the income; this is still subject to the decision of the Ministry of Finance.³⁷ On the other hand, while the maximum percentage that a breeder can get depends on the policy of each institution, the final amount is actually much less than the 30% earlier mentioned. After deductions for taxes, cost of materials, and related expenses for the breeding activities (from the gross sales),³⁸ the breeder could end up with a mere 5% of the profits.

A researcher from IAS considers these avowed benefits for breeders as huge in theory, but not in reality. Even the rationale for the implementation of the PBR, which is to encourage more plant breeding have not translated that well in practice. The researchers believe that there must be a balance in terms of benefits because developing varieties takes a lot of effort and time with some varieties taking up to ten years in development.³⁹

On the part of universities whose funding sources include local and international cooperation on research projects, motivation to conduct research lies not directly or solely upon the monetary incentives but on the prestige attached to the work. More research projects mean more local and international collaborations; the attendant experience and exposure are considered huge rewards in themselves. Universities are pushed to come up with as many publications as they can in order to raise their academic ranking – students heading for college or advanced studies use this as one of their criteria when deciding where to enroll. The number of published studies especially in refereed journals is also a consideration for individual professors to be considered for promotion.

³⁵ Based on FGD with the IAS

³⁶ Based on FGD with plant breeders from the PRC and FCRI

³⁷ Based on FGD with the IAS

³⁸ This may depend on the arrangement with the institutions which the breeders work for.

³⁹ Based on FGD with Cuu Long Delta Rice Research Institute (CLRRI)

2. Private entities

Private seed companies are a mixture of homegrown and foreign entities with the latter dominating the field. They are major stakeholders in the formal seed system in Vietnam, owning vast resources that enable them to conduct research, breeding, seed production, and distribution.

Among the domestic seed companies, the Vietnam National Seed Group Joint Stock Corporation or Vinaseed Group is the largest. It used to be state-owned but was privatized in 2003. Others are the Loc Troi Group, a plant protection company equitised in 2004, Thai Binh Seeds, Phu Nong Seeds, Tan Nong Phat Seeds, Trang Nong Seeds, Long Hoàng Gia Seeds, and Viet Nong (Vino) Seeds, established in 2006.

Foreign seed companies operating in Vietnam include Bayer-Monsanto, Syngenta-ChemChina, Bioseed, Known-You Seeds (locally known as Nong Hu Seeds with its parent company based in Taiwan), East West Seeds or Hai Mu Ten Do, Takii Seeds and Sakata (both Japanese firms), and Vilmorin and Cie (which acquired Tropdicorp, a family-owned domestic company based in Ho Chi Minh City).

Farmers' seed companies and cooperatives. In addition to private seed companies are the farmers' seed companies and cooperatives that are considered small

players in the field. The farmers' seed companies are offshoots of seed clubs, as are some of the cooperatives. Former seed club members decided to establish seed companies in the hope of gaining a wider geographical area for their seed selling activities. Since they were confident about the qualities of their farmer-bred varieties, this was also one way for them to introduce and market these varieties to more communities. However, once they become a company, they can sell only certified seeds as required by the law.

Cooperatives provide an opportunity for the small-scale farmers to improve their productivity, add value to their produce, and increase their access to national and international markets.⁴⁰ The government highly encouraged the establishment of cooperatives and provided support with training and development of the members, purchase of equipment for seed production including machineries, and helping them with their legal rights to produce and sell seeds. The government also outfitted office facilities with equipment and supplies and hired liaison staff to help the members with bookkeeping and basic accounting. In addition, the government even provides for education of the children of the cooperative members.⁴¹

⁴⁰ International Labour Organization (ILO). *Strengthening agricultural cooperatives in Viet Nam*. https://www.ilo.org/global/topics/cooperatives/news/WCMS_545946/lang-en/index.htm

⁴¹ Based on FGD with members of seed clubs and cooperatives

B. Farmers' seed system

*"community seed clubs
topped the preferred
seed sources of
farmers in the
Mekong Delta."*

The farmers' seed system, also known as local, informal, or traditional seed system, is one by which farmers usually obtain their planting materials – saving seeds from their own harvest, exchanging or bartering with relatives and neighbours, or buying seeds from local sources or other farmers. The range of food crops available today, and the remarkable diversity within it, is largely due to the increasing sophistication with which farmers have learned to manage their seed systems.⁴²

The term "farm-saved seed system" (Giong Nong Ho in Vietnamese) was adopted in place of informal seed system by virtue of Decision-35/2008 (MARD 2008). This decision was made to legalise and stimulate qualified individual farmers, farmers' groups, clubs, and cooperatives to engage in breeding, selection, and seed production for household use, seed exchange, or supply in the market. The decision also stipulates that the local government at the province level has the responsibility to support (or fund) farmers who participate in on-farm studies and activities on plant genetic resource conservation, development, and utilization (PGR-CDU), crop improvement (plant breeding), seed production, including supply of affordable seeds to local communities.⁴³

⁴² Robert Tripp, *New Seed and Old Laws* (United Kingdom, Intermediate Technology Publications, 1997), 14.

⁴³ Tin, *Impacts*, 7-8.

In the context of SEARICE's work, the farmers' seed system includes the seed clubs in Mekong Delta. The existence of seed clubs has modified the common definition of the farmers' seed system in Vietnam as they have become an alternate organized source of seeds for communities. The farmer-breeders belonging to seed clubs are trained on proper seed production and even on breeding through participatory plant breeding and plant variety selection using the farmer field school (FFS) approach.⁴⁴ Part of the training of seed club farmers is for them to know the difference between the requirements for seed production and those for grain production, just like in the formal seed system. These farmer-breeders and their seed clubs have immensely strengthened the farmers' seed system in Mekong Delta.

Seed clubs have demonstrated their ability to supply local seed demands by selling their farmer-bred varieties, both certified and uncertified, to seed centres. Uncertified varieties used to be accepted by seed centres which conduct the field inspection of both the field and seed lots, therefore they would be able to guarantee that these were good seeds. Seed clubs have been the key source for farmers due to the availability, accessibility, affordability, high quality, diversity, and adaptability to local conditions of the farmer-developed seeds that they sell. Seed clubs are also among the

important sources of the varieties being sold by farmers' seed companies and cooperatives.

In a study conducted by MDI-CTU and the Community Biodiversity Development and Conservation Programme - Biodiversity Use and Conservation in Asia Programme (CBDC-BUCAP) project in 2005, community seed clubs topped the preferred seed sources of farmers in the Mekong Delta. In 2008, seed clubs produced and sold more than 83,000 metric tons (MT) of good rice seeds, effectively providing approximately 16% of the seed requirement in the Mekong Region (SEARICE 2009). By 2017, the total rice seed demand in the delta stood at 550,000 tons per year. Figure 3 shows that the informal or farm-saved seed system supplies the bulk or 58% of the needed seeds, while the seed clubs provide a little more than a third or 35%. On the other hand, the formal system supplies a mere 7% of the total seed demand in the region.

⁴⁴ The FFS approach is an innovative, participatory and interactive learning approach that emphasizes problem solving and discovery-based learning. It aims to build farmers' capacity to analyze their production systems, identify problems, test possible solutions, and eventually encourage the participants to adopt the practices most suitable to their farming systems. <http://www.fao.org/3/i2561e/i2561e01.pdf>

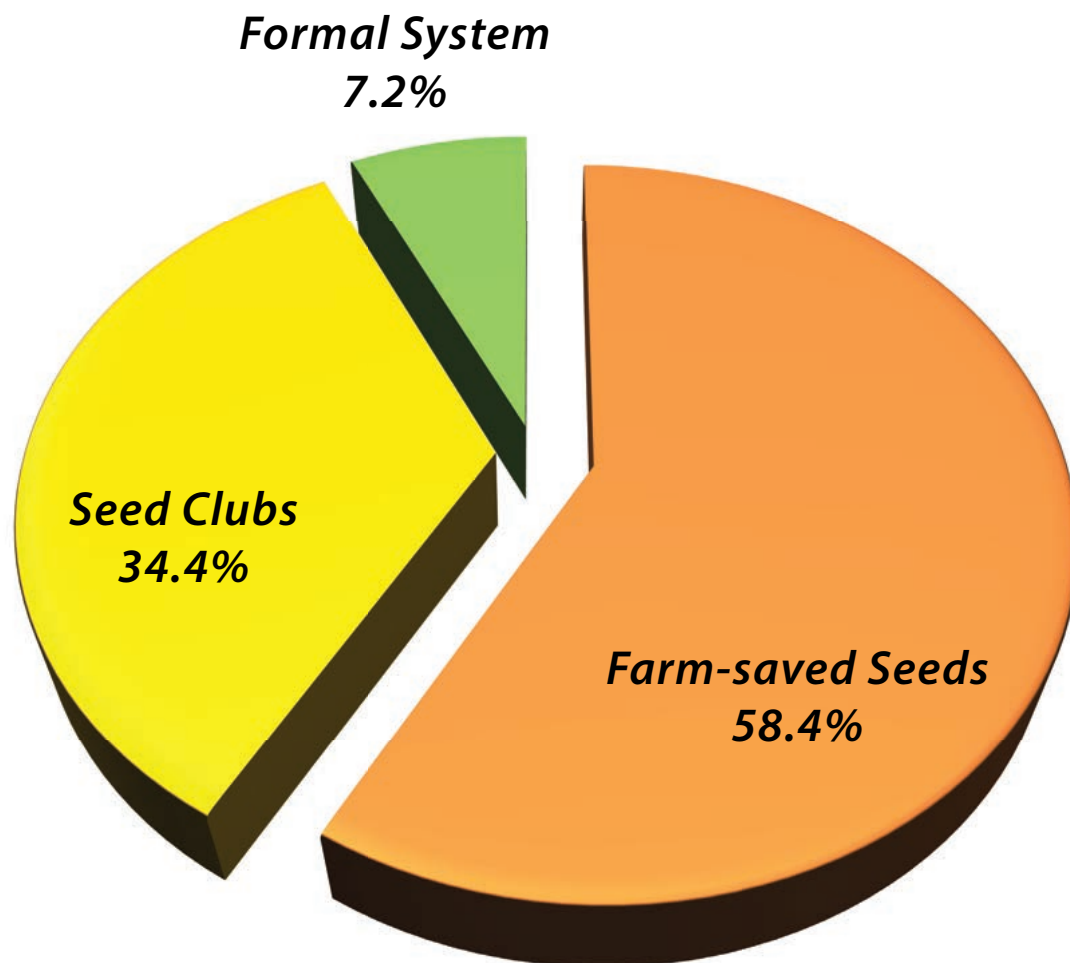


Figure 3. Seed supply systems in the Mekong Delta, Vietnam (2017)⁴⁵

⁴⁵ Based on survey of seed supply systems in the Mekong Delta in 2017 conducted by Huynh Quang Tin in March 2018 for the final evaluation of the Sowing Diversity=Harvesting Security (SD=HS) Project.

The significant contributions of seed clubs in the seed supply system of Vietnam, outlined below, were documented by SEARICE in 2019.⁴⁶

Improve farmers' socio-economic status. Seed club members increased their income with the use of farmer-developed and lower-priced good seeds;⁴⁷ they were able to get a better price for their produce compared to the non-members. In addition, their application of new techniques such as appropriate seeding rates resulted in lower production costs and decreased incidence of pests and diseases, which in turn resulted in better yields. For many farmers, the additional income meant more cash to finance the education of their children while some of them invested the added income in farm improvements.

Provide communities with better access to seeds. In terms of preference on seed sources, farmers ranked seed clubs higher over seed centres, followed by research institutions, agricultural shops, and even their own farm-saved seeds. Seeds from the seed clubs were considered less expensive, more accessible, and were observed to be of high quality.

Enhance private and government extension work. The seed clubs have shown that bringing several farmers together for training while simultaneously establishing learning farms in different areas following the FFS approach has improved the chance of convincing farmers to experiment and adopt or adapt new technologies. Thus MDI, the Extension Centres, Seed Centres, and other extension agencies adopted this approach and framework used by the seedclubs.

Contribute to the enhancement of rice seed biodiversity. As of 2018, seed clubs have produced 360 farmer-developed rice seed varieties, of which five are already certified as national seeds; four more varieties are being tested for registration and certification.

Contribute to the training of the next breed of development workers. Seed clubs are also working with universities and colleges by providing hands-on training to students. This collaboration with academic institutions helps build a new generation of agricultural workers that recognise farmers as equal partners in development.

The MDI-CTU, having been SEARICE's partner since 1991, recognizes the capacities of farmer-breeders and their seed clubs' contributions, particularly in the Mekong Delta. Dr. Dang Kieu Nhan believes that while the overall plan is for seed clubs to develop into an agricultural business, they must remain adaptive to their changing conditions and at all times empower the communities towards making their own decisions (Box 1).

⁴⁶ Tin, Securing, 2-3.

⁴⁷ Good seed is pure (of the chosen variety), full and uniform in size, viable (more than 80% germination with good seedling vigor), and free of impurities such as weed seeds, seed-borne diseases, pathogens, insects, or other matter. Seed should be properly labeled. Retrieved from <http://www.knowledgebank.irri.org/training/fact-sheets/item/using-good-seed-fact-sheet>

Box 1

Creating a living laboratory by supporting farmers

Interview with Dr. Dang Kieu Nhan

Mekong Delta Research and Development Institute-Can Tho University

For many years we were quite active with our plant breeding work. Now we can no longer do as much because we have less funds for such activities, as the university is under the Ministry of Education. Some research institutes have funding because they are under the MARD, although I think less and less research institutes are now being supported.

Here in MDI, we mostly cooperate with and provide support to farmers. We conduct pre-breeding and then let the farmers continue with their breeding activities. Other research institutions do not do that as they are conflicted whether to pursue their own personal economic gain, or to help farmers. Our aim here is not only to link the farmers with the private sector, but more to create living laboratories by closely working with farmers, connecting them with other local people in different value chains.

Our priority crop at MDI is still rice although we also carry out research on some other food crops but we could not do much – considering the financial constraints we are under. Our main goal is

to focus on food security and undertake plant breeding with farmers and local people; we link them with seed companies; and provide market supply information to local authorities to help them with their strategies and interventions. We improve farming systems, from the materials to processing of the by-products, adding value to the products, and improving the facilities, not only to help the farmers but to improve the entire chain.

Our existing plant materials are very good so we use them. We even make use of underutilized varieties such as the IR50404 which did not do well in the international market thus its production was supposed to be discontinued. Here in MDI, we have to find a use for it even if it does not have a big market because it can still be valuable for other parts in the chain like feed for livestock. We should treat all genetic materials as equally valuable and must be utilized, otherwise we may eventually lose them.

One of the certified farmers' varieties, LH8, has caught the interest of seed companies which offered to purchase the ownership from its breeders. The husband-and-wife breeders Mr. Pham Van Long and Mrs. Mai Bich Chuong from Long An Seed Club, Long Ho district, Vinh Long Province decided against selling and applying for protection as they wanted to be able to share their variety with other farmers (See Box 2). Another farmer, Mr. Tran Thanh Hung, from Nui Voi, Tinh Bien District, An Giang Province, has two certified varieties, NV1 and AG1, which he likewise shares with farmers in his community. He, too, neither wants to apply for protection nor sell the rights to his varieties and would rather continue sharing these with other farmers.

The two farmer-breeders are among those who believe that protected varieties cannot be used in their own breeding activities. They worry about using such varieties because the restrictions on their use are unclear to them. Even government officials, particularly those at the local level, are not familiar with the details of Vietnam's PVP Law. And while they may be aware of the breeders' exemption, the law is ambiguous on what essentially derived varieties/EDV,⁴⁸ (or plant varieties which originate mainly from the protected plant variety) actually cover. Hence, to avoid any legal problem, farmers simply choose not to use protected varieties for their crop breeding activities.



⁴⁸ A variety that is deemed to be an EDV cannot be commercialized without the authorization of the rights holder of the initial variety (from which the EDV was derived). This means that the application of the rules may reduce competition between breeders, as they risk the possibility of being prevented from commercializing a new variety if it is found to be an EDV. From <https://www.publiceye.ch/en/publications/detail/a-dysfunctional-plant-variety-protection-system>

Box 2

We can better help farmers with our plant breeding

Mr. Pham Van Long and Mrs. Mai Bich Chuong,
Husband and wife farmer-breeders of LH8 from Long An Seed Club

We stayed with our seed club rather than join a cooperative because our work is more focused and effective, and we can better help farmers with our plant breeding. We have a good trainer and we know the varieties we created are of good quality; we just need to make traders and more farmers notice their potential.

We select parent materials based on the current needs of the farmers—tolerance to salinity and drought and other desired characteristics. It does not matter if they are of foreign or local origin as long as they are not protected. If we use the varieties protected by PVP, we may have issues in the future so we try to choose seeds with similar characteristics and make sure that they are not protected. We used to be concerned only with the farmers' needs in choosing the parent materials, not caring much about anything else. Now (aside from thinking about whether materials are protected or not), we also have to consider market demand. But materials available for selection have now become fewer, making the job more difficult for plant breeders.

We have successfully registered three varieties at the local level. One has received national certification while the other two are undergoing the process. There are two advantages of certification: first, there is no limitation on the distribution because the varieties have already undergone nationwide quality testing; and second, the process of certification connects us with the scientific community and serves as

another way for us to promote and market our varieties to government institutions.

We continue with our activities because breeding gives us satisfaction and joy. But we need to have the funds to be able to do it. We have learned how to budget and use part of what we earn for plant breeding. Because of our efforts, people are recommending him (pointing to the husband). We are now known in the community and it gives us a sense of pride that we are recognized for our hard work. When we attend festivities and parties, people recognize us right away and what we do, and it really makes us proud of what we have achieved.

Given the opportunity, we would like to seek help from the government in finding materials for breeding. There are a lot of good materials, but access to them is difficult. We would also request for technical and logistical support for the registration and certification processes as we really want to have our varieties registered and certified. Finally, we need financial support and this must be consistent and provided in all provinces. The science and technology department (of MARD) must do that to encourage breeding activities.

With the capacity that we have developed through our projects, we can easily adapt to these challenges whatever they may be. We can overcome and meet the requirements of certification with the right support from the government.



Hồng Ngọc



Đặc Sản
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NẾP ĐẶC SẢN
AG-NẾP

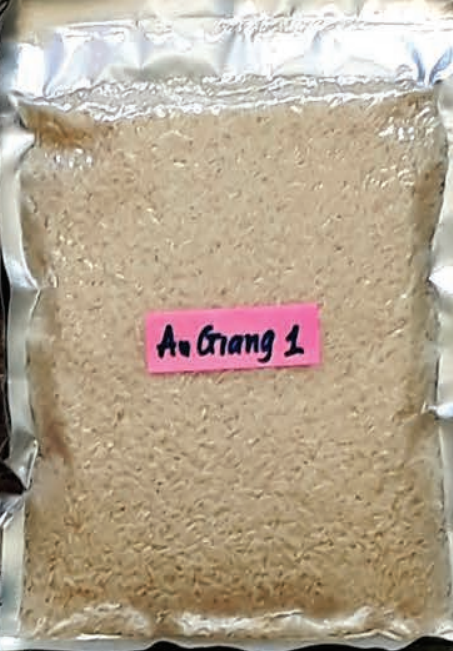
SỞ KHOA HỌC VÀ CÔNG NGHỆ
TỈNH AN GIANG



TÂN ĐẠT



Gạo Tím
Ba Nhứt



An Giang 1



GAO THƠM AN GIANG

Giống AG1



LH8



GAO
Giá Rai 24



GAO DINH DƯỠNG TÍM SEN

(HƯƠNG DẦU ĐEN TỰ NHIÊN)
(Đặc sản Lấp Vò)
SẢN XUẤT THEO QUY TRÌNH HỮU CƠ SINH HỌC

| | | |
|-----------------|---------------------|--------------------|
| 7.3% PROTEIN | 5.5% GLUCOSE | 11.5mg CHẤT SẮT |
| 115mg CANXI | VITAMIN B1, B2 | 16.5mg Amylose |
| | 46.5mg VITAMIN E | |

100g gạo dinh dưỡng tím sen

Dinh Dưỡng Tuyệt Vời
Đạt Chuẩn An Toàn Cao Cấp

Quà Tặng Không Bẩn

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NGỌC ĐỎ HƯƠNG DỨA LV

(Đặc sản Lấp Vò)
SẢN XUẤT THEO QUY TRÌNH HỮU CƠ SINH HỌC
100% KHÔNG SỬ DỤNG THUỐC HÓA HỌC
SẢN PHẨM ĐƯỢC CẤP CHỨNG NHẬN ATTP SỐ: 78/2020/180/PT-NT-ĐT

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|-----------------|---------------------|--------------------|
| 7.3% PROTEIN | 5.5% GLUCOSE | 11.5mg CHẤT SẮT |
| 115mg CANXI | VITAMIN B1, B2 | 16.5mg Amylose |
| | 46.5mg VITAMIN E | |

100g gạo Ngọc đỏ hương dứa

Đạt Chuẩn An Toàn Cao Cấp

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TM16



LH14



**KỸ THUẬT CANH TÁC
THÍCH ỨNG BIẾN ĐỔI KHÍ HẬU**
Best Practices in Climate Change Adaptation

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IV. Constraints in scaling up seed club operations on crop improvement, plant breeding, and seed production activities

Restrictions in the country's seed laws⁴⁹

The Government Decree 7/CP of 1996 “Management of Plant Seeds” laid the foundation of the regulatory framework for certifying new plant varieties and management of crop varieties in Vietnam. Other relevant laws include Decree 7/CP of 1996 which covers collection and conservation of genetic resources, research, variety selection and crossbreeding, developing new varieties, trial production, mass production, trading, importing, exporting, seed quarantine, and seed quality control. This also includes testing and registration, certification, and release of all new plant varieties developed by private or government plant breeding institutions or individuals. Circular No. 2/NN-KNKL/TT of 1

March 1997 issued by MARD provides the implementing guidelines for Regulation 07/CP of 1996. This covers the processes and protocols in variety evaluation and testing, trial production, and related procedures for variety approval and release, as well as issuance of permits for mass production, trading, import, and export. The National Centre for Seed Evaluation and Seed Certification (NCVESC), per MARD Order No. 72 of 1998, is mandated to conduct the testing and evaluation of the varieties for certification at the national and regional levels.

However, these laws were amended and superseded by new laws that ensued as the government pursued its accession to the

⁴⁹ This section on restrictions was lifted from SEARICE, *Farmer-Bred Varieties: Finding their Place in the Seed Supply System in Vietnam. The Case of the HDI Variety*, 2013. SEARICE, The Development Fund, Oxfam-Novib.

1991 Act of the International Convention for the Protection of New Varieties of Plants (PVP) and its eventual membership to the International Union for the Protection of New Varieties of Plants (UPOV) in 2006, as the 63rd member state.

From 2000 to 2005, the government charted the roadmap for streamlining its plant variety policies in accordance with the UPOV standards. Part of the required step to UPOV membership was the issuance of the Ordinance on Plant Varieties, also known as The Seed Ordinance (No. 15/2004/PL-UBTVQH) on 24 March 2004, which is a merger of Decree No. 7/CP/1996 on the management of plant seeds and Decree No.13/ND-CP/2001, the New PVP Law. The 2004 Seed Ordinance provides for the updated regulations on the management and conservation of plant genetic resources, including research, selection, breeding, assays for VCU and DUS of the plant variety; recognition and protection of new plant varieties; evaluation, selection and recognition of maternal plants, initial plants, variety gardens, variety forests; production and trading of plant varieties; and the quality control and management of plant varieties.

Supplementary to the 2004 Seed Ordinance is the regulation on the certification of quality standard conformity of plant varieties, as established by MARD through Decision No. 52/2006/QD-BNN dated 23 June 2006. This Decision stipulates that MARD provides the order and procedures for registration, field expertise, sample taking and preservation, quality

testing and certification, and post-inspection of seed lots on the list of plant varieties subject to certification of quality standard conformity. It also designates the institutions responsible for the implementation of the said procedures.

In addition, MARD issued a supplementary regulation (Decision No. 9S/2007/QD-BNN dated 27 November 2007) that provides for the order and procedures for the recognition of new agricultural plant varieties. It includes VCU and DUS testing, trial production, recognition, naming of the new agricultural plant varieties selected, and whether these are imported or domestically created for inclusion in the list of plant varieties permitted for production and trading.

The 2004 Seed Ordinance embodies the current system and policies that govern the national certification of new plant varieties and seeds in the country. It also directs the new role of farmers in the formal and informal seed systems, their livelihoods, the course of plant genetic resources development, conservation and management, and the state of on-farm agricultural biodiversity. It is important to note that under the Ordinance, propagation and purchase of seeds not included in the list of plant varieties permitted for production and trading is prohibited (Article 9.2).

Restricted access to affordable seeds

Prior to the implementation of the PVP Law, farmers could freely choose from among the varieties developed by researchers and breeders; they could reuse, exchange, and sell the seeds, or otherwise use them as materials for breeding. But free access was cut when Vietnam implemented the PVP Law which stipulates that new varieties from various public institutions, once protected, can no longer be multiplied for distribution to farmers by seed centres – unless the latter was able to buy a license for seed production and sale). In most cases, the license to multiply and sell seeds is issued to seed companies who can afford to pay the rights for seed distribution. In effect, new crop varieties especially when they are really of good quality become accessible only to the private seed companies with resources to purchase the rights to them.

Once ownership is transferred, seed companies have the sole authority to multiply and distribute the seeds. Moreover, these companies have the power to set the price of seeds of protected varieties which can be sold as much as 2.5 times higher than other commercially available certified seeds.⁵⁰ A case study on the impact of UPOV on the Vinaseed Group showed that the average selling price of its PVP products have reportedly gone up by 115% compared to the public ones.⁵¹ Vinaseed's major subsidiary SSC in particular claims to have lower selling price for seeds compared to foreign seed companies.⁵² If this assertion is true, then the price of seeds from other companies is definitely beyond the reach of most smallholder farmers.

Farmers who want to avail of the good varieties have to pay from 1.5 times⁵³ to 2.5 times higher than what they would usually spend – not only on seeds but on agricultural inputs which go with the commercial seeds developed by big seed companies.⁵⁴ However, only rich farmers can afford the high price. Smallholder farmers can buy from seed centres, which likewise have to compete with private seed companies in accessing protected materials to be able to serve the farmers. Seed centres help by subsidising the cost of seeds, but the amount depends on their respective capacities. Seed subsidies in most provinces (mostly from poor regions) range from 30% to 70% of the actual costs.⁵⁵

This is one of the reasons why public research or plant breeding institutions opt to just sell licenses instead of selling the rights to seed companies. As those interviewed from the FCRI put it, in order to accelerate the process of introducing and distributing seeds to farmers, the institute establishes a "scientific enterprise" or simply a project of selling licenses (to multiply and distribute seeds) to several seed companies in each geographical region.⁵⁶ But small enterprises, especially those owned by farmers, can no longer participate in this process, thus excluding them from the chain.⁵⁷

Even when farmers can afford to buy the high-priced seeds, there are limitations to what they can do with the materials developed from the protected varieties. Although farmers can use the new varieties for their breeding activities, they cannot

⁵⁰ Estimate provided by the PVPO Director

⁵¹ Vinaseed Group, n.d. UPOV in Vietnam: A Case Study of the Vinaseed Group. [http://eapvp.org/files/report/docs/myanmar/6_UPOV%20in%20Vietnam%20\(A%20Case%20Study%20of%20Vinaseed%20Group\).pdf](http://eapvp.org/files/report/docs/myanmar/6_UPOV%20in%20Vietnam%20(A%20Case%20Study%20of%20Vinaseed%20Group).pdf)

⁵² Based on FtGD with SSC

⁵³ Estimate by those interviewed from FCRI is 1.5 to 2 times

⁵⁴ Based on FGD with the IAS

⁵⁵ Based on FGD with the IAS

⁵⁶ Dao The Anh, *IP Protection and Commercialization of Innovative Seeds in Vietnam: Situation and Challenges (FCRI)*, 3-4.

⁵⁷ Based on FGD with the IAS

multiply the seeds for distribution to other farmers as they used to do when varieties were not yet protected. This restriction greatly impacts on their livelihood and even on the potential of farmers to strengthen their capacity in seed production.

The market-oriented plant breeding is another restriction for farmers in terms of diversity of choices. According to Dr. Nguyen Thi Quynh Thuan of IAS, the focus of plant breeding and seed production has shifted with not much attention given to crops like vegetables despite the high local demand. As a result, 95% of vegetable seeds sold in agricultural supply stores are imported. For rice and maize, highly priced varieties are beyond the means of resource-poor farmers and the choices they are left with are those that may not be of the best quality. Imported seeds also cost more and their quality is uncertain.

When asked how farmers are benefitting from the PVP Law, the Plant Variety Protection Office (PVPO) stated that the farmers do not care much about paying higher price for good quality seeds as long as they have access to them, and the varieties are high yielding which gives them more profit. But this may be true only in the case of the richer farmers. Smallholder farmers are quite particular about the price of seeds as this adds up to their production costs which may even increase in the event of crop failure. Mr. Tu Ba Dat, a seed club member, disproved the claim of the PVPO, saying that there are rice varieties like the protected OM5451⁵⁸ which are very difficult for farmers to access as they have to pay a higher price for them. He asserted that there must be open access to seeds and there should be no protection so that everybody can benefit.

The process of protecting a variety is too prohibitive for farmers, universities, and small farmers' seed companies but is considered bargain price for large

companies. The application fee alone already costs VND2,000,000 (USD87) while testing fees vary, depending on the crops. The annual maintenance fee is VND3,000,000 (USD130.4) for the first three years and increases every three years (Table 1). Other fees include Registration of contract on transfer of rights of protected varieties, Issuance of PVP certificate, Priority for application, Grant license of rights-to-plant varieties representation services, Grant license of inspection rights-to-plant varieties, among others.

Once varieties are protected, the price of their seeds increases. When farmers cannot afford the high cost of protected seeds, they may simply give up their land and possibly look for other sources of livelihood. Members of small seed companies who participated in the FGD asserted that the protection of varieties is beneficial mostly for large seed companies (Box 3).

The major flaw of the PVP Law in Vietnam is its treatment of farmers as end-users only, which is simply not the case. Were the farmers also recognized as plant breeders or seed producers/traders and invited to participate from the conceptualization stage of the law, then incentive mechanisms for seed innovations would have been very different. In this scenario, the mechanisms would acknowledge their limitations but, at the same time, still value their role or potential contributions in the seed supply. These would take into account that the raw materials used in plant breeding are a result of the primary work of farmers. As such and at the very least, the incentive mechanism for plant breeders would not unduly restrict the inherent rights of farmers to seeds, emphasizing that any future innovation is simply riding on top of farmers' previous innovations.

⁵⁸ This is one of the "Omonrice" varieties developed by CLRR

| | VND | USD |
|---------------------------------|----------------|----------|
| Application Fee | | |
| a. First Application | 2,000,000.00 | 87.00 |
| b. Re-application | 1,000,000.00 | 43.50 |
| Technical Testing Fee | | |
| a. DUS test for seasonal crops | 8,300,000.00 | 360.90 |
| b. DUS test for yearly crops | 11,000,000.00 | 478.30 |
| c. DUS test for perennial crops | 24,000,000.00 | 1,043.50 |
| d. Breeder conducts DUS test | 50% of the fee | |
| Annual Maintenance Fee | | |
| a. First Three Years | 3,000,000.00 | 130.40 |
| b. 4th - 6th Year | 5,000,000.00 | 217.40 |
| c. 7th - 9th Year | 7,000,000.00 | 304.30 |
| d. 10th - 15th Year | 10,000,000.00 | 434.80 |
| e. 16th to 20th Year | 20,000,000.00 | 869.60 |

Table 1. Cost of Plant Variety Protection in Vietnam⁵⁹

Note 1: Currency conversion used: USD1 = VND23,000

Note 2: On average, a Vietnamese farmer currently has an annual income of 33 million Vietnamese dong (over 1,450 U.S. dollars). From:

http://www.xinhuanet.com/english/2018-04/03/c_137085044.htm

⁵⁹ The cost for DUS testing for rice is 12,000,000 VND/cropping season. Full DUS test is conducted for two cropping seasons. That means the yearly cost is 24,000,000 VND. Still on rice, the maintenance fee is 3,000,000 VND/year (for the first three years). Law on Applicable Fees for Protection of Plant Varieties - Ministry of Finance; Plant Variety Protection Office – Vietnam. Procedures for PBR Registration in VN, PVP Fees. Retrieved from: <http://pvpo.mard.gov.vn/>

Box 3

Bigger companies are the ones benefitting from the protection of varieties

FGD with small farmer seed companies based in An Giang Province:

Sau Ri Seed Company and Vinh Qui Seed Company

Almost all the seed companies in our area started out as seed clubs. In our case, we began in 2004 as members of a seed club where we practiced plant breeding as we learned it from SEARICE. In 2011 we decided to venture out as a seed company. When we started, we dealt with all kinds of seeds but eventually decided to simply focus on rice. Our seed company operates only within the province, but there are times when we link with other companies in other areas.

We can do multiplication and distribution of certified seed varieties. However, we can no longer multiply the seeds once they are protected. And this is a huge hurdle for us. Because of the protection of good varieties, our choices are limited to unprotected varieties like IR5404 and Jasmine, which are not as sought after thus the profit margin is also not as good. We can still resell the protected varieties, already packaged and labeled from other companies, but the returns are minimal or none at all.

Small seed companies are at a disadvantage. We cannot afford to buy seeds from CLRRRI as they sell the seeds that they developed directly to seed centres that have the money and capacity to pay for them. Foundation seeds come from them; and the right to seed distribution is given to large seed companies and seed centres but not to us. We buy the protected variety at VND12000/kg (USD0.52/kg) from seed centres. From what we know, seed centres buy the license to multiply the protected varieties from CLRRRI for around VND2000/kg (USD .087/kg).

With the PVP Law, the quantity of the seeds that we can sell has been halved as there are very

few unprotected varieties left (mostly the less popular ones); we can no longer multiply and sell the protected varieties. Before, we could get a net profit of VND500 VND/kg (USD.022/kg) but now it has decreased to VND200/kg (USD.0087/kg) – and that is if we are lucky, because sometimes we could not even sell these. We may be forced to reduce or totally abandon seed production and concentrate on selling milled rice.

We can buy the license to multiply protected varieties for distribution, but it is way too costly that there would be nothing left for our distribution activities. Only big companies have the resources to buy the licenses to distribute the seeds as they have the marketing capabilities. One company that we cannot compete with is Loc Troi which sells seeds, pesticides, and other agricultural inputs. It is a large company which also operates in Laos and Cambodia.

The situation is very difficult, and it will become harder if things continue as they are. We cannot stop selling the seeds right away because we get them on loan, so technically we are forced to sell. What we need in the immediate term is to establish networks to help us sell the seeds in other provinces. We need the local government to help us and intervene in this matter.

We do not know what the future will be but it definitely does not look good, and there is a high probability that we will stop our operations. Bigger companies are the ones benefitting from the protection of varieties.

Limited structural support for varietal development and marketing of farmer-bred varieties

The lack of investment in the farmers' seed system is a huge handicap for farmer breeders. The varieties that they have developed – as in the case of the LH8 variety – suffer from lack of visibility, despite being already recognized by research institutions and seed companies. Farmer-bred varieties are mostly known only within the communities or districts of their breeders. Rice traders are not familiar with farmers' varieties and are unsure about their quality. The competition is stiff as big seed companies have the capacity and resources to promote their own varieties down to the local levels.

The big seed companies provide information especially on their new varieties through advertising campaigns and marketing gimmicks,⁶⁰ enabling them to create an impression that their varieties are superior or of the highest quality. In the FGD held with officers from the Southern Seed Company,⁶¹ they confirmed that marketing can be very difficult for small companies. They added that SSC has a considerable budget for advertising and marketing their seeds and that their connections through their established market networks prove important in the distribution. Dr. Pham Hung Cuong of the PRC admitted that government institutes, due to resource limitations, have difficulty in distributing the seeds to the local level. He thinks that there may be an opportunity to promote them

through private seed companies who have extensive promotional strategies.

Plant breeders acknowledge that farmer-breeders are capable of producing good varieties, but that they have limited or no support at all when it comes to making their varieties known.⁶² While farmers can sell their own varieties, they can only go as far as the district level. As a result, even the very good farmer varieties which are already certified are quite underutilized and not as popular as those from the large seed companies. Farmer-breeders from the seed clubs interviewed said that they cannot compete not because their varieties are not of good quality; one interviewee declared that their varieties are as good as the commercial ones, if not even better. They believe that their biggest challenge is that they cannot afford the marketing strategies and distribution networks that the private enterprises have at their disposal.

A report on the State of Plant Genetic Resources for Food and Agriculture (PGRFA) in Vietnam by the Food and Agriculture Organization (FAO) affirms the problems raised by farmers engaged in seed production. The report states that local seed producers and communities often face difficulties in selling their seeds as bigger producers normally have more advantages.⁶³

⁶⁰ Based on FGD with CLRRI

⁶¹ SSC was established by the State in 1976 became a joint stock company, but was eventually privatized in 2004. Vinaseed Corporation (was also a state-owned company until it was privatized in 2003.

⁶² Based on FGD with IAS

⁶³ Pham Thi Sen and Luu Ngoc Trinh. Vietnam Second Country Report on the State of the Nation's Plant Genetic Resources for Food and Agriculture. FAO, 2010.

Registration and certification process unsuitable for farmers' needs

The 2004 Seed Ordinance states that all new plant varieties are required to register and undergo national evaluation, as stipulated in Article 15, sections 1-3.

Article 15. New Plant Variety Evaluation

- 1 A new plant variety that has been selected, bred, or imported and which has not appeared in the list of plant varieties permitted for production and business must be evaluated and released before putting it in the list.
- 2 Types of evaluation for the new plant varieties:
 - a). All the new plant varieties belonging to the list of major crops which are selected and bred in Vietnam are as the imported varieties from abroad which do not exist in the list of plant varieties permitted for production and business must be evaluated by the national evaluation;
 - b) The varieties belonging to other species will be evaluated by the breeder and the breeder will be responsible for the results.
3. Contents of evaluation include:
 - a) Evaluation of distinctness, uniformity and stability (DUS test)
 - b) Evaluation of value for cultivation and use (VCU test)

The Seed Ordinance stipulates that for a new variety to be officially certified as a national variety that can be released, legally mass produced, and traded, it must meet the following requirements: has passed the DUS and VCU tests; has undergone multi-location and large-scale trial production; and must have a proper variety name. A variety must pass these pre-conditions for MARD to approve, recognize, and include it in the list of varieties for production and business (Article 15, section 7). Propagating and purchasing a seed which is not included in the list of plant varieties permitted for production and trading is prohibited, as specified in the Seed Ordinance (Article 9 Section 2). Violation of the provisions in the Seed Ordinance has corresponding administrative sanctions and monetary fines, as stipulated in Decree 114/2013/ND-CP.

The prohibition to sell and buy uncertified seeds under the Seed Ordinance prompted farmers to seek help for the certification of their varieties. HD1, the first farmer-bred certified variety (Decision QD 630/TT-CLT, 23/12/2010), was developed by Mr. Nguyen Van Tinh, a member of the My Lam Seed Club in Hon Dat District, Kien Giang Province. The variety is high yielding; adaptable to areas with salinity-acid sulfate problems; resistant to brown plant hopper; has long grains; has high milling recovery rate; does not require high use of nitrogen fertilizer; and with its short growth duration,

it can be planted for three rice cropping seasons per year.⁶⁴ These qualities are all contained in one variety that has wide adaptability across different agroecosystems, which should make HD1 highly marketable.

But it took almost five years before Mr. Tinh's HD1 variety received national certification in December 2010 (Figure 3). The process was long, tedious, and expensive. The variety gained certification with financial assistance from SEARICE for conducting the required tests and production trials via the initiative CBDC-BUCAP Programme. DUS and VCU testing fees alone cost a minimum of USD 625 per variety. In addition, the farmer has to shoulder the cost of conducting multi-location testing, yield trials, and mass production trials.⁶⁵

The registration and certification processes are a major deterrent for farmers with lesser resources to participate in this requisite under the formal seed system. As one interviewee remarked, by the time the variety is registered, they would have already moved to another variety or there are already more popular varieties in the market.⁶⁶ Mr. Tu Ba Dat explained that the registration and certification fees are quite costly and that many farmers do not have the capacity in undertaking the documentation required. He added that in order to be able to continue their work, the members need assistance with the application documents and other logistical support, or otherwise for the government to make the process simpler. He asserted that their varieties are good varieties and that these can qualify for certification.

For their part, public researchers believe that these redundant certification and exhaustive processes are a waste of time and resources. They think that there is no need to conduct a large number of testing in different parts of the country for national level certification because the varieties are meant to be used locally anyway. Furthermore, there should be no need for national registration and certification because seed centres are already conducting testing and other scientific processes and these should be enough as other requirements are simply unnecessary.

Some varieties are already proven adaptable to specific conditions and ecological systems in the areas of concern but the Seed Ordinance still requires the varieties to be tested in other regions with vastly different agro-ecological conditions. Researchers and breeders believe that there must be a process that can be more appropriately applied for most of these farmer-bred varieties – something like a regional or localized certification – which should be simpler, faster, and a lot less expensive. As the materials are to be used by the local communities, farmers can assume the responsibility of guaranteeing the performance of their varieties.

⁶⁴ SEARICE, *Farmer-Bred Varieties*, pp 12-13.

⁶⁵ *Ibid.* 15.

⁶⁶ Based on FGD with provincial seed centres in Bac Lieu, Soc Trang, and Vinh Long and Co Do Agricultural Company, a state-owned seed company.

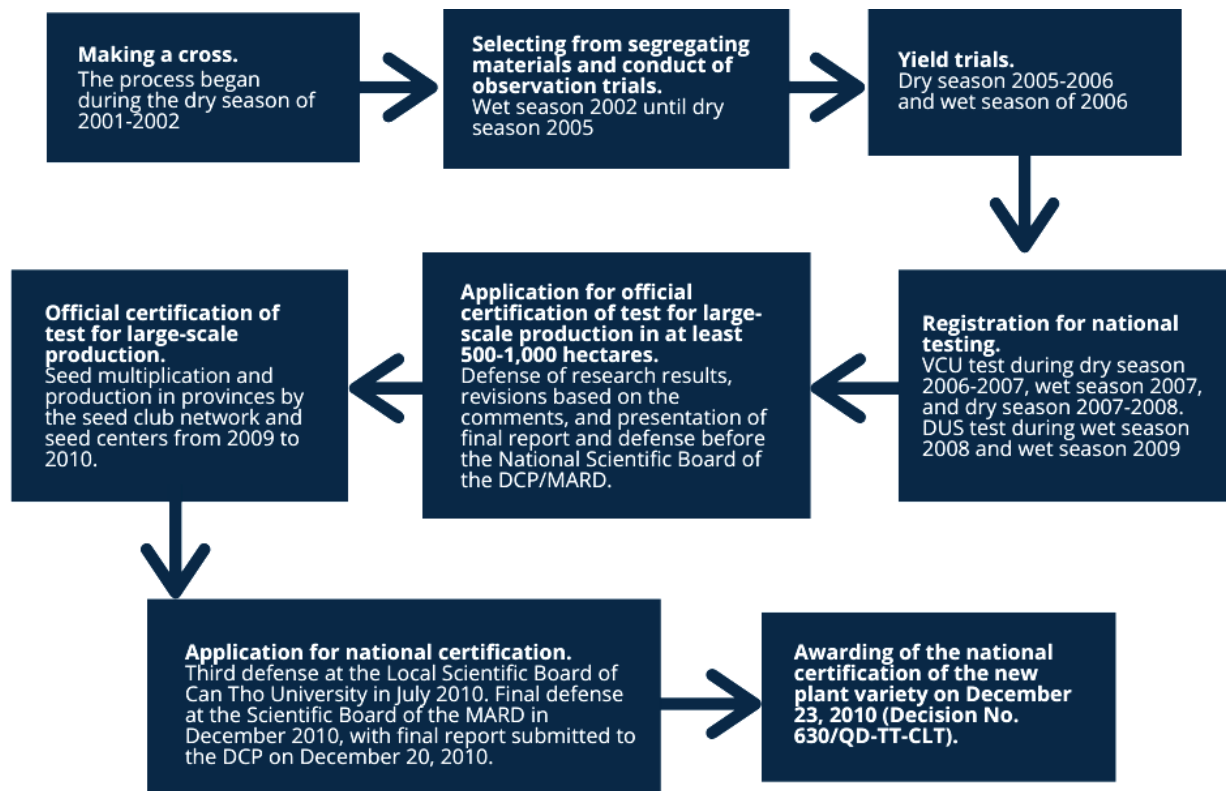


Figure 4. Process of certification for HD1 rice variety

Source: Farmer-Bred Varieties: Finding their Place in the Seed Supply System in Vietnam. The Case of the HD1 Variety, 2013. SEARICE, The Development Fund, Oxfam-Novib





V. Conclusion and Recommendations

Among all the countries where SEARICE implements participatory plant breeding or farmers' breeding, it is Vietnam which achieved the most impressive accomplishments mainly due to the support provided by its local governments. The government's recognition of the crucial role of farmers in the seed systems is key to the success of any plant breeding program. The experience of the seed clubs in the Mekong Delta is a testament to this narrative. The seed clubs provide a third of the rice seed supply in South Vietnam which makes them an integral part not only of the farmers' seed system but of the entire seed sector. The success, however, is under serious threat as the country's agricultural landscape favors a market-driven and export-oriented economy. In recent years, the government enacted several policy reforms in compliance with "international standards" to encourage foreign investments and abide by trade agreements.

Among the encouragements given to investors in the agricultural sector is the Seed Ordinance which is proving to be detrimental to smallholder farmers as it prohibits the selling of uncertified seeds. The seed registration and certification process that farmers must go through to be able to sell their seeds on a large scale is unnecessarily rigid, even in the view of the public plant breeders interviewed. While the national certification awarded to the five varieties developed by the seed clubs has proven the capabilities of farmers as breeders, the experience also proves that without external support, they would not be able to comply with the technical and financial conditions required under the Seed Ordinance. Thus, many of the farmer-bred varieties, despite their quality, cannot be made available to other farmers outside of their communities. In most cases, farmers have to use farm-saved seeds which may not always be of good quality. This is unfortunate when there is a largely

untapped potential of farmer-breeders and seed producers capable of filling the gap in the seed supply dominated by the formal seed system but which can meet only 7% of the seed requirements in the Mekong Delta.

Another legislation which was meant to encourage innovation among plant breeders is the PVP Law. But in reality, it gives professional plant breeders more monopoly rights over the varieties they develop and unduly restricts the farmers' seed system and farmers' rights, and eventually, their opportunities to innovate. The intention of the law is good, but the impact is damaging especially to smallholder farmers because they cannot multiply and sell seeds of protected varieties. This restriction impedes their capacities on selection breeding and in seed production. Based on evidence on the ground, seeds of protected varieties are unaffordable to smallholder farmers, and the age-old tradition of seed exchange and sharing among themselves is restricted. This limits their potential to earn additional income from seed production and distribution.

The move to privatise research/plant breeding and seed production relegates the seed systems in the hands of a few seed companies whose primary purpose is to gain huge profits. The private sector has an important role to play in the seed system but as profit-oriented entities, it is but natural for them to simply focus on crops and varieties from which they could get maximum returns on their investment. However, the limited number of crops and

varieties that they produce cannot meet the needs of smallholder farmers; this also worsens plant genetic erosion and increases the vulnerability of the farming systems.

The PVP Law appears to be more rewarding for the private seed sector than for the public breeding institutions, as articulated by all the plant breeders interviewed. In addition, since the shift to privatisation, they are more pressured to develop varieties that would bring in investments for their institutions to the detriment of smallholder farmers who they are also mandated to serve.

Seed clubs and their farmer-breeders have huge potential to fill the gap in the seed supply and cutting them off from the system is counterproductive. In addition to loss of income opportunities, the contribution of seed clubs to agricultural biodiversity, as well as provision of diverse choices of locally adapted and affordable seeds to other farmers are potentially put at risk. The formal and farmers' seed systems are complementary and should co-exist for the seed systems to function most effectively and efficiently. Efforts to integrate in the global market must be inclusive, and require a harmonizing approach where no one is left behind, particularly smallholder farmers who are the most affected by reforms in agricultural policies. Ms. Nguyen Thuy Kieu Tien of the CLRRRI sums it up: "There is a need to balance the economic incentives, recognise the breeders, and, of course, provide service to the farmers."

Creating this balance will improve the prospects for scaling up crop breeding and seed production activities of seed clubs even beyond the Mekong Delta. Toward this end, the authors recommend the following:

The farmers' seed system as a recognised integral part of the seed supply system in Vietnam requires support with policies that will allow it a fair opportunity to contribute to the needs of farmers, particularly those with minimal resources.

The seed registration and certification processes need to be streamlined and localised as the varieties are meant to be used in local communities. There should be no need for national certification as seed centres are already conducting testing and other scientific processes and those should be enough for the purpose. Many of the farmer-bred varieties were already proven adaptable to the agroecological conditions in the provinces where they were developed. Testing them in various regions of the country should be optional and not part of the certification requirement; this should be done only with the aim of evaluating how the variety will perform in other locations.

A different registration and certification process for farmers is called for – one that is more appropriate to their conditions. This may be localised (provincial level). Farmer-breeders have little interest in protecting their varieties for several reasons and even want to share their work with other farmers, but on the other hand they also worry that the varieties they developed will be misappropriated. Registration is their defense mechanism to protect their varieties against misappropriation. Certification would ascertain the quality (purity, germinability, adaptability, and moisture content, among others) of their varieties. not part of the certification requirement; this should be done only with the aim of evaluating how the variety will perform in other locations.

Capacity building for farmer breeders and potential farmer breeders. More farmers can be capacitated through extensive training from the seed centres, extension centres, and university research institutions such as MDI. The institute is exploring platforms for cooperation towards agroecology and is considering development of other upland crops for the farmers' seed clubs, which will include but is not limited to plant breeding activities.

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Promotion of farmers' varieties will give these varieties a better chance of being known outside the breeders' communities and therefore potentially expand their market. Although their varieties are certified or even just proven to be of good quality, farmers cannot compete with the extensive advertising and marketing strategies employed by seed companies. The government should support the introduction of farmers' varieties to traders and provide the link between the two sectors. This can also be further developed as a mechanism for farmers to know of varieties developed by their fellow farmers in other locations (which they can access).

2 Small enterprises and farmers' networks are in much need of support and incentives for them to continue their operations. More networks need to be established to assist in selling farmer-developed varieties in other provinces. This would ease the difficulties faced by small farmers' seed companies in marketing their seeds.

3 The government should come up with a rewards and incentives system suited for public researchers and breeders. Although they appreciate the financial incentives from PVP, they would rather have this balanced with other forms of rewards. As one interviewee put it, it is not just about the money but the recognition that comes with plant breeding is equally important – to be acknowledged for one's efforts and accomplishments which these scientists are very proud of. One breeder mentioned that there must be more scientific recognition other than just certificates of appreciation, e.g., advanced training including more opportunities to study abroad. Providing more non-monetary incentives could further inspire researchers in their work instead of having to make a choice between enriching themselves and responding to the real needs of farmers.

The government should adapt its PVP strategy to be more appropriate to the needs and conditions of the majority of local farmers. Research and breeding activities by smallholder farmers should be supported for the development of varieties that will not be cuffed with plant breeder's rights. The varieties should remain unprotected such that they can be multiplied and distributed much more freely by seed clubs, seed centres, and small seed companies. But measures to protect farmer-bred varieties from misappropriation should be in place.

The PVP Law should be amended to include a clear definition of private and non-commercial use of protected seeds. The amendment should accommodate for the exchanging and limited selling of protected varieties among smallholders under the non-commercial exception.

In the midterm, Vietnam should amend its PVP Law to be inclusive of the implementation of farmers' right to save, exchange, and sell seeds thereby respecting and taking into account the needs, realities, and rights of farmers as enshrined in the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP).



