5 Promoting policy support for the enhancement and marketing of farmers’ varieties in Vietnam

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Tamxoan is a local rice variety cultivated by the Kinh people in the coastal lowlands of the Red River delta in northern Vietnam (Haihau district, Nam Dinh province). The size of the area planted with Tamxoan in the district has decreased rapidly since the early 1990s due to the subsidized introduction of hybrid rice varieties (and chemical fertilizers) in the area, which has been part of the government’s efforts to increase rice production to guarantee local food security and to supply Vietnam’s burgeoning rice export market. The quality of Tamxoan rice had also been slowly worsening as a side effect of its neglect. In recent years, people had started to notice negative aspects associated with growing hybrids in the area, for example, environmental impacts, rising costs of fertilizers and susceptibility to some diseases. As a result, there has been a renewed interest in local varieties, at least in some areas. Since 1999, local farmers, the Vietnamese government, universities and an international agricultural research organization have been working together to enhance Tamxoan in order to improve its already favourable qualities and to make it a more competitive alternative, or complement, to hybrid rice. This chapter will provide an account of these efforts. It will also describe the way in which Vietnamese laws concerning intellectual property, seed quality and, most recently, farmers’ innovation have supported, or created challenges for, the enhancement, protection and marketing of the variety.

The replacement of local varieties with hybrid rice

Haihau district is flat and just a half a metre above sea level. Most of the farms are small – approximately 800 square metres. There are a few small villages, but most people live in the countryside. Farming accounts for three-quarters of the local economy. The primary crop is rice, but farmers also grow maize, sweet potatoes, vegetables, legumes, litchis, oranges and pomelos. Farmers in the district currently plant 12 different rice varieties, including several hybrids and four local varieties: Tamxoan, Nep cai hoa vang, Nep Thau dau and Nep Ba Lao. Of these four local varieties, Tamxoan has historically been the most popular, partly based on the fact that the other three varieties are glutinous (i.e. ‘sticky’ rice) – which are generally less widely used in Vietnam than nonglutinous rice – and also because of its flavour, soft texture and length.
In 1991, the Vietnamese government launched a program to boost rice production. Among other things, the program involved boosting Vietnam’s own rice-breeding capacity and the import of hybrid rice varieties from China. By 2006, 600,000 hectares of hybrid rice was being grown in the country, with the main concentration to be found in the north of the country in the Red River delta. The reason for initially concentrating hybrid production in the north is that the north was more food insecure than the south of the country, where the rich Mekong delta provides excellent conditions for high levels of rice production (Vien and Nga, 2008).

Many of the high-yielding Chinese hybrid seeds took far less time to reach maturity and produced a high-quality rice. Their yield was also considerably higher, averaging 5–6 tonnes per hectare, whereas Tamxoan (before it was enhanced through the project’s efforts) yielded approximately 2.4–2.6 tonnes per hectare (Binh et al., 2004). Another advantage for farmers was the fact that such varieties could be grown both in the spring and summer, while the traditional varieties could only be planted in the summer and harvested once in the fall. Having two harvesting seasons made it easier for farmers to spread the work out over a longer period of time. In addition, the hybrid plants were much smaller and, therefore, not so susceptible to lodging. Lodging, which occurs when the plant grows tall and is blown over by the wind, is a common problem for Tamxoan. It often results in a damaged plant and a reduced yield per hectare. The improved varieties assured farmers in the community an increased production and, therefore, provided them with a secure livelihood. Farmers with average or good quality plots were even able to sell a part of their harvest since they often produced more than they needed for their own consumption.

Subsidies provided by the government made the expensive hybrid seeds available to farmers at half of the market price. In addition, falling prices for chemical fertilizers and pesticides made the cultivation of these hybrid varieties less costly. The government also advised farmers on the techniques for fertilizer and pesticide application. Within a few years, high-yielding hybrid varieties were being grown more extensively than the traditional varieties. By the end of the 1990s, only about 10 percent of the total cultivated area in Nam Dinh province was dedicated to local rice varieties (Trinh et al., 2003). From the perspective of many farmers, the cultivation of traditional landraces implied a return to the past. Ultimately, this nationwide production of improved Chinese and Vietnamese hybrid rice boosted agricultural production throughout Vietnam, allowing the country to become self-sufficient and reducing poverty and starvation. It also served to raise export levels, bringing in much-needed currency.

The pendulum swings back: rekindled interest in local varieties

However, this remarkable phenomenon in rice production also had some negative side effects, one of which was the erosion of traditional rice varieties, especially in
the Red River delta and in Nam Dinh province, where the reliance on hybrids was growing most rapidly. Hybrid seeds cannot be saved and replanted by farmers each year. Instead, farmers have to return to commercial suppliers for seed each year. While on the one hand, the increased yield may justify this form of dependence on commercial seed producers, it left farmers vulnerable to fluctuating seed prices on the other hand, and prices generally increased as a result of the fact that government subsidies were eventually cut back. Finally, the improved varieties required far more chemical fertilizers and pesticides, which was an additional expense for farmers and also was beginning to be recognized as a hazard for human health and the environment. Over the past 5–10 years, the Chinese hybrids turned out to be particularly vulnerable to some pests, so increased use of pesticides was necessary. As the pests grew more resistant, still more pesticide was required, with increasing environmental consequences and costs to farmers. As a result, some farmers in Nam Dinh province started to become dissatisfied with the hybrid varieties and were interested in investigating alternatives.

Tamxoan clearly merited reconsideration. It is culturally important, used in local rituals such as food in the village festivals, local conferences and meetings, wedding parties, Tet holidays and ceremonial offerings, funeral repasts and banquets. Its taste and smell is considered to be superior to that of the Chinese hybrids, and it consistently received a higher price at the local markets. Farmers could save and replant its seed, and it required less expensive inputs (i.e. less fertilizer and pesticides). However, the price differential was not enough to overcome, on a significantly wide scale, the economic incentive to cultivate the Chinese hybrids. To make Tamxoan more competitive, it needed to be improved to increase its yield, to ensure it was consistently high quality and to decrease its tendency to lodging.

At roughly the same time, the Vietnam Agricultural Science Institute (VASI) and Cantho University, in partnership with the International Plant Genetic Research Institute, initiated the Vietnamese component of an internationally coordinated project called Strengthening the Scientific Basis of In Situ Conservation of Agricultural Biodiversity on Farm (In Situ Project) (Chuong et al., 2003). The project sought to:

1. support the development of a framework of knowledge on farmer decision-making processes that would influence the in situ conservation of agricultural biodiversity;
2. strengthen national institutions for the planning and implementation of conservation programs for agricultural biodiversity;
3. broaden the use of agricultural biodiversity and participation in its conservation by farming communities and other groups.

The partners of the In Situ Project were surveying the country for crops and communities with which to work, giving preferences to sites where relatively high levels of crop diversity currently were or had recently been deployed as well as to local varieties with market potential.
Ultimately, it was agreed that the In Situ Project would support a participatory Tamxoan rice enhancement program in Haihau district, using rehabilitation methods with the participation of farmers and breeders. Similarly to the Nepalese case study in Chapter 4 of this volume (which was also supported partially through the In Situ Project), the objectives of this program were to reduce the occurrence of lodging, increase disease tolerance and increase the yield of the selected variety, Tamxoan. At the same time, however, it was important to maintain the traits of Tamxoan for which farmers and consumers had an evident preference. The national partners involved in the program were the Plant Genetic Resources Centre (PGRC) at the VASI, the Centre for Agrarian System Research and Development, the Agricultural Development Office of Haihau district and the Tamxoan-producing farmers’ group of Haitoan village.

The government was behind the enhancement project because it wanted to support a local landrace with market potential that could be grown in Nam Dinh province. It approached the farmers and other stakeholders and asked them to invest in the project in order to help to make Haihau the seed production centre of the project and to make Tamxoan a major source for consumption. The farmers responded favourably. They believed in the potential for improving Tamxoan and were convinced that they could benefit as a result.

**Participatory enhancement of Tamxoan**

The first step was to take a survey of the places Tamxoan was being grown in the area, identifying how such traits as propensity for lodging, height, length of panicle, aroma, taste and yield varied across the populations studied. Based on the survey results, it was possible to identify (through participatory exercises involving farmers) which traits were most appropriate to enhance. Approximately 200 lines related to the Tamxoan landrace were eventually identified and collected within the area. The project team surveyed the availability and quality of the existing seed and investigated the potential areas for increased seed production in the future (assuming that the project was successful and that there would be increased demand for the improved variety’s seed).

In 2000, a group of farmers, representatives from the agricultural department of Nghia Hung, agronomists and cultivators of the PGRC at VASI began the lengthy selection of Tamxoan cultivars through a participatory rural appraisal process. The first step was to identify the typical traits of Tamxoan. Farmers were asked what they considered to be typical Tamxoan characteristics, and these characteristics were put into a ranking matrix, which was the basis of the selection process. Using this ranking matrix, different lines representing the typical Tamxoan characteristics were taken from 20 different farmers’ plots. This group of farmers was known as the key farmer group. After the 2001 harvest, the first selection took place, which focused on morphological traits such as the height of the plants, the colour of the husks (brown-yellow), the colour, size and cooking properties of the rice, and the susceptibility of the plant to disease. This process led to the selection of 40 different lines, which
were planted by the 20 key farmers in the 2002 season. After the 2002 harvest, seven lines were identified as best representing the most important combined traits of Tamxoan, according to farmers and consumers. In 2003, the group evaluated the selected seven lines of Tamxoan and found that each of them had outperformed the reference Tamxoan population for the prioritized traits. The average yield of the seven lines was 3.06–3.20 tonnes per hectare compared to 2.43–2.66 tonnes per hectare for the reference populations (Suu, Trinh and Loan, 2007).

In 2004 and 2005, the new Tamxoan cultivars were evaluated for the first and second time for uniformity and stability as well as for agronomic and postharvest traits. Varieties that did not pass these evaluations were removed. Before planting in 2006, the Haihau farmers and other stakeholders set the seed quantity target for that year’s harvest at 3,000 kilograms. The key farmers cultivated a total of 2 hectares of Tamxoan in 2006 and then raised it to 30 hectares in 2007 since they were beginning to realize that increasing the cultivation of Tamxoan varieties was beneficial to their financial well-being. The government encouraged farmers to cultivate Tamxoan on at least 100 hectares by 2010. The farmers signed a contract with the district government that year that obliged the government to buy Tamxoan seeds from them for a certain price per kilogram. This seed was stored away for the next season’s cultivation, and in this way the government secured a supply of good-quality seed. In addition, the farmers received support in the form of financial resources and education during the selection process and throughout the season. They also received money for organic and chemical fertilizer. At the beginning of the 2007 season, farmers were provided with Tamxoan seed by the district government at a subsidized price that was 75 percent below market value, which was meant to persuade farmers to increase the cultivation of Tamxoan in Haihau district. The subsidy was gradually reduced over the following 4 years. More details about the methods that were followed to enhance and promote Tamxoan are set out in Table 5.1.

As of 2010, the area of land cultivated with Tamxoan began to be reduced. As of 2011, Tamxoan is being cultivated on only 40 hectares of land. The reduction is largely due to the competition from, and increased use of, a new high-yielding variety called Bacthom. Bacthom is a pure line (not a hybrid) introduced originally from China to Vietnam in 2003, and it has been gaining popularity among farmers in North Vietnam. It has a short growth duration and is very similar to Tamxoan in aroma and softness, and it has a higher yield and can grow in two seasons. The Department of Agriculture encourages farmers to grow Bacthom through field visits and the propagation of Bacthom by extension staff as well as by making seeds available to buy.

Despite these pressures, it is likely that at least 40 hectares of Tamxoan will continue to be grown in the coming years. When Tamxoan was given geographical indication protection, on the basis of its useful traits, the local authorities (including the People’s Committee of commune district agriculture division, Haitoan commune cooperative) included plans to grow Tamxoan in the Economic and Social Development Plan of Hai Hau District (Haihau District
### Table 5.1 Procedures and methods adopted for the enhancement of Tamxoan rice in Vietnam

<table>
<thead>
<tr>
<th>Year</th>
<th>Goals</th>
<th>Methods</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>• assessment of field diversity for morphological, agronomic and quality traits</td>
<td>• participatory rural appraisal</td>
<td>• considerable variation in Tamxoan population was found</td>
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<tr>
<td></td>
<td><em>par</em></td>
<td>• baseline survey</td>
<td>• three major Tamxoan production areas were identified in Nam Dinh province</td>
</tr>
<tr>
<td></td>
<td>• participatory rural appraisal</td>
<td>• an analysis of the cultivation of Tamxoan in four groups of farming communities in Nam Dinh province (large households with a large farming area; large households with a small farming area; small households with a large farming area; small households with a small farming area)</td>
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<tr>
<td>2000</td>
<td>• development of selection tasks for Tamxoan enhancement</td>
<td>• selection work was undertaken jointly by project team and farming communities</td>
<td>• selection task set to improve the Tamxoan population through the evaluation of preferred traits</td>
</tr>
<tr>
<td></td>
<td>• analysis of preferred traits</td>
<td>• trait analysis done with the help of expert farmers and traders</td>
<td>• landrace enhancement procedure designed</td>
</tr>
<tr>
<td></td>
<td>• collection of accessions for evaluation and enhancement</td>
<td>• project team visited primary farmers’ field at harvesting stage and selected 10 panicles from each household plot</td>
<td>• 200 lines of Tamxoan collected from three production areas</td>
</tr>
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<td>2001</td>
<td>• diversity assessment and selection of lines for the identified preferred traits</td>
<td>• two sets of 200 lines were assessed in farmers’ field – one in Haihau and another at Nghia Hung</td>
<td>• 40 lines were selected according to grain size, field tolerance to leaf blight, strong culm, plant height lower than 150 centimetres, aromatic flavour and productive plants</td>
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<tr>
<td>2002</td>
<td>• evaluation of 40 selected lines of Tamxoan for leaf blight and lodging tolerance, yield components and the identification of quality traits preferred by market and consumers</td>
<td>• performance assessment trial set up in Haihau</td>
<td>• seven lines of Tamxoan landrace confirming most of the preferred traits and high genetic similarity coefficient were selected for further evaluation</td>
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<tr>
<td></td>
<td></td>
<td>• data collected for further screening</td>
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<tr>
<td></td>
<td></td>
<td>• simple sequence repeats were used to test the genetic relationship of 40 lines</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• market survey and consumer feedback used to select for quality traits and the selection of lines on the basis of postharvest micromilling and organoleptic tests</td>
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</tr>
<tr>
<td>Year</td>
<td>Goals</td>
<td>Methods</td>
<td>Outcomes</td>
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</table>
| 2003 | - evaluation of seven lines of Tamxoan for agronomic and postharvest traits  
      - assessment for aroma traits  
      - assessment for wider adoption in Haihau | - agronomic trials set up in farmer’s field at Haitoan in Haihau district for postharvest traits (aroma, stickiness, amylose content and so on) | - bulk lines of Tamxoan to create the multiline Tamxoan variety |
| 2004 | - the first evaluation of the new Tamxoan variety for agronomic and postharvest traits was completed on a large scale  
      - improved cultivation technique test for Tamxoan was given | - first trial for uniformity and agronomic traits was conducted at Haitoan in Haihau district  
      - tests were conducted for aromatic levels  
      - lines that did not pass were removed | - the new Tamxoan performed better than the normal cultivars  
      - surveys were completed to identify the Tamxoan market |
| 2005 | - second evaluation of the new Tamxoan for agronomic and postharvest traits was completed on a large scale  
      - improved cultivation technique test for Tamxoan was given | - second trial for sustainability and agronomic traits was conducted at Haitoan in Haihau district  
      - tests were conducted for aromatic levels  
      - lines that did not pass were removed | - the new Tamxoan performed better than the normal population  
      - new seed multiplication  
      - the cultivation technique for Tamxoan was improved |
| 2006 | - trial of large scale (production pilot) and cultivation technique was developed for new Tamxoan variety  
      - evaluation and seed production | - evaluation for yields, uniformity and quality of grain  
      - evaluation by Ministry for Agriculture and Rural Development and the Department for Agriculture of Nam Dinh | - 2 hectares were set aside for the production of seed for next season’s production  
      - production pilot was developed for Tamxoan rice market  
      - management protocol for Tamxoan was created |

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<table>
<thead>
<tr>
<th>Year</th>
<th>Goals</th>
<th>Methods</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>• seed production of new cultivar</td>
<td>• participatory varietal selection and seed production through farmers’ participation in many locations in Haihau district</td>
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<tr>
<td></td>
<td>• field visit by members of the Variety Test and Trial Centre and the Ministry for Agriculture and Rural Development</td>
<td>• application submitted to Department of Intellectual Property Rights</td>
<td>• 30 hectares of the new Tamxoan were cultivated</td>
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<td>• marketing was continued by farmers’ group</td>
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<td></td>
<td></td>
<td></td>
<td>• production pilot initiated for Tam xoan rice market</td>
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<tr>
<td>2008</td>
<td>• new Tam xoan population was proposed for release</td>
<td>• management of Tam xoan production and market</td>
<td>• 60 hectares of the new Tam xoan were cultivated</td>
</tr>
<tr>
<td></td>
<td>• it was registered for protected geographical indication</td>
<td>• application submitted to the Department of Intellectual Property Rights</td>
<td>• Tam xoan rice registered for protected geographical indication as ‘Haihau Tam xoan’ variety</td>
</tr>
<tr>
<td></td>
<td>• seed is produced for new population</td>
<td>• 432 farmers of Haihau Tam xoan Association cultivated 60 hectares of the new Tam xoan variety</td>
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</tr>
<tr>
<td>2009</td>
<td>• Tam xoan market is increased</td>
<td>• 432 farmers of Haihau Tam xoan Association cultivated 60 hectares of new Tam xoan variety</td>
<td>• 60 hectares were cultivated with Tam xoan rice for production and marketing</td>
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<tr>
<td>2010–11</td>
<td>• the sustainable production of Tam xoan was maintained</td>
<td>• 432 farmers of Haihau Tam xoan Association cultivated their land with the new Tam xoan variety</td>
<td>• 35–40 hectares were cultivated with Tam xoan rice for production and marketing</td>
</tr>
</tbody>
</table>

*Source*: Centre for Agrarian Systems Research and Development (2009). The format for this table was reproduced from P. Shrestha’s case study in Chapter 4 of this volume concerning the enhancement of Pokhareli Jethobudho in Nepal.
People Committee, 2004). The local authority still works to raise awareness among farmers about the value of Haihau Tamxoan and encourages them to grow it. Agricultural scientists with the Vietnam Academy of Agricultural Sciences also have plans to further increase the quality and yield of Haihau Tamxoan and to encourage the marketing and spread of Tamxoan in the future.

Policy and legal support for cultivation and marketing of Tamxoan: Vietnamese intellectual property and seed marketing laws

In Vietnam, at the time of the project, there was no possibility for farmer or farming communities to obtain intellectual property protection over plant varieties in their own names. Nor was it possible for farmers or farming communities to be acknowledged under Vietnamese variety release and seed quality regulations. To address this situation, the stakeholders involved in the Tamxoan project in Nghia Hung and Haihau (i.e. the key farmers, the community leader, the Centre for Agrarian Systems Research and Development, the VASI and the district government) established an association named the Haihau Tamxoan Production and Marketing Association. The association has been operational since January 2006. Under the Plant Variety Ordinance, which was issued by the Vietnam National Assembly in 2004, this association has registered the new Tamxoan variety under the name Tamxoan Haihau rice. To be registered under the Plant Variety Ordinance, a variety must satisfy the conditions of being distinct, uniform and stable (DUS) and represent enhanced value for cultivation and use (VCU). Once a variety is registered, it may be sold commercially within Vietnam.

The association also applied, in its own name, for geographical indication protection for Tamxoan Haihau rice, pursuant to the Intellectual Property Law of Vietnam. Geographic indication protection was granted, and the new cultivar was officially registered (and made subject to geographic protection) by the Department of Intellectual Property Rights in July 2008. The Ministry of Agriculture and Rural Development supported the decision of the local authorities to register geographic indications for agricultural products. The protection afforded by the law extends across the entire country.

For the first time in Vietnam, the registration of Tamxoan Haihau rice under both of these laws enabled farmers to be recognized as the co-developers of the new variety since they were the members of the association. The farmers, as well as the concerned organizations, were thereby exclusively eligible to produce and market the seed of this enhanced Haihau Tamxoan cultivar anywhere in Vietnam. The Haihau community considers itself the original source of Tamxoan, and the association has been responsible for designing the labels, creating the packaging and arranging the transport of the cultivar to external markets. Some of the rice, with its new packaging, has been sold in the Haihau district and also in Hanoi, which is relatively easy to arrange since the road from Haihau to Hanoi is in excellent condition.
Some of the experiences in this project have confirmed the need for further policy reform to support farmers as conservers and developers of crop diversity and new crop varieties. Some of the people and organizations involved in the project have continued to be involved (once the project ended) in policy development activities that culminated in another project entitled the Regulation on Production Management of Farm Households’ Plant Varieties (Household Plant Varieties Regulation), which was adopted by the Ministry of Agriculture in 2008 (see Chapter 23 of this volume for more details about this regulation). 5

Among other things, the Household Plant Varieties Regulation allows farm households to register varieties under the national seed law and to apply for intellectual property protection for varieties under the national intellectual property law in their own name. It also validates processes such as participatory plant breeding and participatory variety selection. The regulation sets the legal and administrative basis for the government to provide financial support for farmers’ activities to use, improve and conserve local crop diversity. However, while the Household Plant Varieties Regulation is still relatively new, the procedures that farmers must follow are still very complicated, and it seems likely that most small farmers will not have the capacity or funds necessary to satisfy the requirements for the DUS and VCU tests.

The project’s experiences in looking for ways to recognize farmers’ contributions to the development of Haihau Tamxoan under the laws that existed at that time, and through the creation of the Haihau Tamxoan Production and Marketing Association, were partially responsible for the decision to draft and adopt the Household Plant Varieties Regulation.

Notes
1 The Kinh people are the major ethnic group in Vietnam, comprising approximately 85% of the country’s population (Wikipedia, online: <http://en.wikipedia.org/wiki/Vietnamese_people> (last accessed 12 November 2012).
2 Now named Bioversity International, one of the fifteen International Agricultural Research Centres of the Consultative Group on International Agricultural Research.
3 Plant Variety Ordinance (Phap lenh giong cay trong), Vietnam National Assembly (March 2004).
5 Regulation on Production Management of Farm Households’ Plant Varieties, Decision no. 35/2008/QĐ-BNN (15 February 2008).

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