“Strengthening Capacities to Enhance Coordinated and Integrated Disaster Risk Reduction Actions and Adaptation to Climate Change in Agriculture in the Northern Mountain Regions of Viet Nam”

Seed Production, Storage and Maintenance for Strengthening Capacities in Disaster Risk Reduction and Adaptation to Climate Change in Agriculture for the Northern Mountainous Areas of Vietnam

TECHNICAL REPORT
Hanoi, 2011
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Executive Summary
Using local varieties (such as Chiem Huong, HT1, BT13, SH14, BT7, T10, TL6, Seng Cu) is currently considered as best option for food/seed security for the Northern mountainous provinces of Phu Tho, Yen Bai and Lao Cai (Vietnam). This has been concluded after series of interviews at communal level with farmers, local extension staff and authorities since January 2010.

During the winter – spring (January – June) and summer – autumn (June – September) cultivating seasons of 2010, their technical advantages (wide adaptation, resistance to drought, coldness and pest/disease, short cultivating term and notably the possibility to spare seed for emergencies) and economical advantages (reasonably high yield and good quality, high market value and high marketing possibility) are demonstrated by staff of NOMAFSI and concerned people at 6 demo sites for seed production groups in the 3 provinces as best solution, in the context of DRM, for agriculture in the region. In line with the field demos, number of 1-day field-school trainings have been conducted for farmers, group members and extension staff of the commune and district in pace with each stage in local rice/seed cultivating calendar for the purpose to raise the awareness of people about the importance of varieties in terms of preparedness and resilient capacity building for DRM and adaptation to Climate Change at commune level and to strengthen their cultivating and technical knowledge. In addition, the pattern of seed production group, introduced for the first time in FAO project TCP VIE/3010, during this project, has been implemented at higher level, i.e., enhancement of group capacity in post harvesting, trading and marketing of their product in cooperation with the seed center.

Together with activities at grass root level (communal), a number of activities have been conducted at provincial and regional level including interviews/discussions with provincial Seed Centers, DARDs, and Extension Centers for the purpose of strengthening the provincial/inter-provincial seed production/storing and distribution network. As the result, a 4-days certificate training course on variety seed production/storage and field inspection techniques was organized from 25 - 28 May 2010 in cooperation with Department of Crop Production (DCP – MARD, instructors) and NOMAFSI (logistics) for 27 people who are selected staff from NOMAFSI, provincial DARDs, provincial/district extension Centers and provincial Seed Centers. This is very important action of the project, as for the first time, those 3 provinces will have qualified team of Field Inspectors with National Certificate, servicing for seed quality maintenance, following the regulations of MARD concerning with seed production and circulation. The Seed Centers and Extension Centers gradually get more involved in the project implementation and start linking with the seed production groups.

Activities conducted at grass root and provincial levels are dedicated to implementation of a proposal for Strategy on Seed production, Storage and Maintenance for the Northern Mountainous Areas for the purpose of DRM and Adaptation to Climate Change in agriculture. The strategy has 2 – fold goal: (i) ensuring continuous seed supply for the purpose of DRM at local level (ii) Maintaining the seed quality in the region. The goal can be achieved through strengthening the 4- pillar (stake holders) linkage: Government (DARDs/Extension system) – Business (Seed Centers) – Scientist (NOMAFSI) – Farmers (Seed Production groups) and through establishment of inter-provincial seed production/supply system , backed-up by a technical team of well trained field inspectors and a Regional Seed Test Laboratory located in the Seed Center of Lao Cai province.

It is recommended the project to:
- Support further trainings on Sampling Techniques for Field Inspectors and Laboratory Seed Testing Techniques for staff of Lao Cai Seed Center.
- Support the application of slope technology on steep terrain areas for sustainable cassava production and preventing soil degradation/erosion and landslides.

- Continue M&E for: (i) lessons learned from the grass root (commune) and ground (provincial) level for mass duplication within time frame of UNJP/VIE 037 UNJ as well as for adaptation/coordination in other future projects relating to Disaster Risk Management and Adaptation to Climate Change at Central Government level (MARD, DMC) (ii) lessons learned relating to strengthening the 4-pilar system for the purpose of DRM and Climate Change adaptation in Agriculture (iii) Impacts of the Agriculture component, including Seed production, Storage and Maintenance, onto the political, institutional and individual capacity building in the context of DRM and Adaptation to Climate Change.
1. Introduction
For increasing the rice production to afford the food security, hybrid seed has been used for decade in the Northern mountainous region of Vietnam. The natural disasters such as storm and damaging coldness in 2008 and the currently severe drought have caused the concern: emergency supply of seeds and other inputs during the natural disaster occurrence creates a situation of dependency from external aids in most cases in the region. This concern needs to be addressed and overcome by empowering the institutions and farmers’ capacity for disaster preparedness and mitigation and climate change adaptation, to build resilience and at the same time to influence the political level to reconsider and rationalize their current seed policy for food security. Seed production, storage and quality maintenance, as a sub-component of the UNJP/VIE 037 UNJ project “Strengthening Capacities to Enhance Coordinated and Integrated Disaster Risk Reduction Actions and Adaptation to Climate Change in Agriculture in the Northern Mountain Regions of Viet Nam”, has following main scopes for implementation in 3 pilot provinces of Phu Tho, Yen Bai and Lao Cai:

- To assess crops and varieties currently used by the communities, the seed supply and storage practices, and link with the existing seed production programmes at the provincial and district level in order to identify potential to introduce new crops/varieties and/or technology for disaster mitigation in agriculture production.

- In cooperation with NOMAFSI to start development of community based seed production and storage systems for appropriate crops and varieties through development of seed production group as a form for maintaining the seed buffer and responding to the seed demand on continuous basis for the purpose of disaster mitigation and resilience building.

- To implement the individual capacity building process through training programme(s) with topics relating to advanced technology for production of commercial grain/seed of varieties under the form of “Field – School” for the selected farmers from the seed production group and extension staff.

- In cooperation with the Crop Department of MARD to build capacity of the staff of DARDs, Seed Centers through training on seed production, storage methods and quality maintenance.

- To design and prepare a strategy for seed production, storage and maintenance in accordance with the national policies, plans and priorities, acceptable and preferred models at different levels.

The main body of this report includes:

- Assessments on: (i) Current crops and varieties, seed supply and storage practices at commune level, linking to the seed programmes prevailing in 3 provinces and (ii) Potential for introduction of new crops, varieties and the development of community based seed production and storage systems for preparedness and disaster mitigation

- Training programmes for capacity building of: (i) the staff of provincial Seed Centers and DARDs (ii) the selected farmers and extension staff at district and commune level

- Set-up demonstrations for seed production groups at commune level in 6 districts (2 districts in each province) together with criteria for selection, technical purpose for each demo to be solved.

- Proposal for strategy on seed production, storage and maintenance.
2. Implementation of the Seed Production, Storage and Maintenance

2.1 Assessment on crops and varieties in 3 provinces

2.1.1 In Phu Tho

The province’s topography is characterized with dense network of rivers and canals. The typical natural disasters are: cold weather and recently severe drought (in the winter – spring production season) and whirlwind, flood and flash flood, inundation (in summer – autumn production season). The flood in August and the coldness in 2008 had killed 12,000ha of transplanted rice and the severe drought this year (2009 – 2010) led to the switching to other crop of 7,000ha which used to be the rice cultivating land.

Land: The province’s rice production area is of approx. 36,000 ha. On average, each household cultivates 2 – 3 saos (1 sao = 360m2) up to 7 – 8 saos at max and each commune cultivates approx. 100 – 150 ha of rice

Seed usage

Through the surveys, conducted at commune level, it has been recorded that up to 2008, the ratio (%) between the land, sowed with hybrids and the land, sowed with varieties is about 60/40 (even 70/30 like in poor commune of Lang Son, Ha Hoa district) as a result of very intensive subsidy programme of the provincial authority for hybrid seeds supplied through the province’s Seeds and Plants Center. In the contrast, in some district such as Doan Hung district, the ratio hybrids/varieties is 30/70 due to the farmers’ discontentment of quality of hybrid seed and its economic efficiency.

Most of popularly used hybrids are of Chinese origin and (as commented) suitable for inundated (hollow) with acid soil areas; only Nhi Uu 7 and Nhi Uu 838 are with short cultivating period and suitable for summer – autumn production season (from end of May till mid of September) where the farmers need to free their land for winter corn season. However, the hybrids have number of disadvantages. Most of them are very sensitive to bacterial blight disease. In terms of yield, the hybrids could give remarkably higher yield on condition that adequate fertilization to be in place (but for which most of the farmers cannot afford). So the common yield recorded has practically showed just little difference from the one of varieties. The hybrids commercial grain has lower eating quality and can be sold at lower price, mainly for feedstuff for livestock and here comes the total revenue/hectare which is always inferior to the revenue/hectare from the variety. One of the most important disadvantage of using hybrids is the dependence from the seed importation (90% from China) as farmers cannot spare the seeds, meaning the lack of seed buffer for production resilience in case of disaster occurrence which destroys their rice field and assets. The hybrids have intensive demand of water and strict cultivating calendar which cause another important disadvantage. The high price of the seed has caused annually dozens billions (VND) from the province budget for subsidy and free grant for the poor households.

The most popularly used varieties are Khang Dan 18, Q5, and HT1. In the same cultivating conditions (fertilizers application, plant protection etc.), the varieties give slightly lower yield/ha than the hybrids. However, the better eating quality always ensures the higher market price for commercial grain (VND 7mns/ton) and higher total revenue/ha from varieties. Normally, the people grow varieties (of good quality) for their own consumption. One of key advantages of the varieties is possibility to spare seeds as resilient buffer in case of disaster occurrence. The seed can be purchased at much cheaper price (normally VND 12,000/kg for seed of grade “certified 1”; and VND 20,000/kg for foundation seed, without subsidy from state budget). Farmers just need approx. 60kgs/ha for sowing (Or VND 0.7mn/ha, less than half price of hybrid).
<table>
<thead>
<tr>
<th>Hybrid</th>
<th>Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>Khang Dan 18, Q5, HT1 (most commonly used), BT13 (created by NOMAFSI), Bao Thai</td>
</tr>
<tr>
<td><strong>Seed price</strong></td>
<td>VND 50,000 – 80,000/kg</td>
</tr>
<tr>
<td><strong>Sowing dosage/ha</strong></td>
<td>30kgs</td>
</tr>
<tr>
<td><strong>Cultivate period</strong></td>
<td>Strict application</td>
</tr>
<tr>
<td><strong>Yield</strong></td>
<td>5.0 – 6.0 tons/ha</td>
</tr>
<tr>
<td><strong>Eating quality</strong></td>
<td>Low to average</td>
</tr>
<tr>
<td><strong>Market value</strong></td>
<td>VND 5.8 – 6.0 millions/ton</td>
</tr>
<tr>
<td><strong>Sensitivity to Disease</strong></td>
<td>Sensitive to rice blast, sheath blight, bacterial blight</td>
</tr>
<tr>
<td><strong>Pest Sensitivity</strong></td>
<td>Less sensitive</td>
</tr>
<tr>
<td><strong>Drought Sensitivity</strong></td>
<td>Sensitive, water demanding</td>
</tr>
<tr>
<td><strong>Inundation/acidity Sensitivity</strong></td>
<td>Strong and high stem, suitable for inundated and acid soil areas</td>
</tr>
<tr>
<td><strong>Weather sensitivity</strong></td>
<td>Cold resistant</td>
</tr>
<tr>
<td><strong>Seed spare possibility</strong></td>
<td>No</td>
</tr>
</tbody>
</table>

### Quality, Storage and Distribution

In general, both hybrids and varieties are more infected/attacked in summer – autumn season by rice blast, sheath blight, bacterial blight, brown plant hopper, leaf folder and stem borer, but the varieties with high eating quality (Chiem Huong, HT1) are more sensitive to the pest attack while the hybrids are less resistant to the diseases.

The subsidy policy for hybrids seed supply has negatively impacted the seed distribution system (which is dominated by the Seed & Plants Center of the province) and the extension system (which is practically suppressed and became “hybrid seed retail network” – as commented by the V. Chairman of PC of Minh Phu commune, Doan Hung district). The storage system practically does not exist at district and commune level. The seed demand of each household/commune is summarized through commune extension staff and submitted to the extension station of the district and then forwarded to the Seed & Plants Center. The Center contracts with seed producers (Chinese and Vietnamese) for importation and further distribute to their own outlets and district extension networks.

For the last 2 years, the hybrid seeds supplied by the Seeds & Plants Center have had serious problems: very low germination percentage, extended growing period and deteriorating quality,
very unstable supplies (quantitatively and qualitatively), rocketing selling price; These problems have caused serious concerns and discontentment from the districts/commune authorities and the farmers.

The varieties (Khang Dan, HT1) seeds are partly supplied through the outlet networks of the Seed & Plants Center. For most of demand of varieties seeds, as common practice, the farmers spare the seeds and exchange amongst the neighbours/relatives at the rate 1kg seed for 1.5kg commercial grain for the next season. During the harvesting, the farmers intuitively select the best parcel of their rice field, separately harvest and dry for about 2 days on the sun to get the moisture they think suitable. Then the seed is kept in wooden/metal casks or simply in jute bags. Due to such primitive selection and storage condition, two issues emerge: high impurity of the seed leading to the *variety degeneracy* and short *storage life-time* (for only 6 months as max).

Most of the seeds used in the province are from the *Centre Seed and Plants* of Phu Tho province. The seeds processing in the Centre is mechanized by means of large (40 tons/batch, suitable for rice and maize seeds) and small drying machines; both types are locally made and the screening and sizing line, installed in 2007 within a DANIDA’s assistance project. The Centre has 2 hectares as experimental field. According to the Vice Director, the Center can produce foundation seeds of varieties Khang Dan 18, Q5 (old ones) and Huong Thom (very high eating quality, suitable for flat areas). In the practice, the Center’s activities more concentrate on the trading, namely importation of hybrid seeds from China and in this province, the clear seed production programme(s) does not exist.

### 2.1.2 In Yen Bai

Most of the province’s territory has mountainous topography; there are also some flat areas, suitable for seed production. The typical natural disasters are: flash flood, landslides in rainy and storm season (July – September) and sometimes very cold weather in winter. In some mountainous areas (e.g., Lam Giang commune, Van Yen district), very fast expansion of cassava cultivation on steep terrain exposes thousands hectares to the risk of land erosion and degradation.

*Land* - The province’s rice production area is about 19,000 ha. On average, each household cultivates 2 – 3 saos (1 sao = 360m²) and each commune cultivates approx. 120 – 150 ha of rice.

**Seed usage**

The ratio (%) between the land, sowed with hybrids over land, sowed with varieties has been about 70/30. The province has policy to increase the percentage of varieties so that the ratio to be about 60/40 (This means 500 tons of varieties seeds and about 400 tons of hybrids are required for each season).

Farmers use hybrids mainly for winter – spring rice season (January – May) due to (i) their resistance to cold weather (which sometimes causes the damage to agriculture) (ii) the province’s policy to subsidize the seed price or to donate to the poor family (which cost the province budget up to VND dozens billions per year). Similar to the situation in Phu Tho province, other economic indicators of hybrids such as: seed price, average yield, eating quality, market value of commercial grain and total income/hectare are always inferior to the varieties. Again, farmers cannot spare the seeds, meaning the lack of seed buffer for production resilience in case of disaster occurrence which destroys the rice field and assets of the people.
The varieties have certain advantages to the hybrids in terms of economic efficiency, possibility to spare seed as resilient buffer in case of disaster occurrence. People grow varieties (better quality) for their own consumption. The seed can be purchased at much cheaper price (normally VND 12,000/kg for seed of grade “certified 1”; and VND 20,000/kg for basic seed, without subsidy from state budget). The study in Dai Phac commune (Van Yen district) has shown production cost for varieties is 20% lesser than for hybrid

<table>
<thead>
<tr>
<th>Hybrid</th>
<th>Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Nhi Uu (838; 69; 6), Thuc Hung 6, (Chinese, imported), HYT 100, TH 3-3, VL 20, Dong Cuong (Vietnamese, produced in the production farms of the Seed Center of province)</td>
</tr>
<tr>
<td>Seed price</td>
<td>VND 50,000 – 60,000/kg</td>
</tr>
<tr>
<td>Sowing dosage/ha</td>
<td>30kgs</td>
</tr>
<tr>
<td>Cultivate period</td>
<td>Strict application</td>
</tr>
<tr>
<td></td>
<td>Shorter, suitable for summer season</td>
</tr>
<tr>
<td>Yield</td>
<td>5.0 – 5.5 tons/ha</td>
</tr>
<tr>
<td>Eating quality</td>
<td>Low to average</td>
</tr>
<tr>
<td>Market value</td>
<td>VND 5.0 millions/ton, for feedstuff</td>
</tr>
<tr>
<td>Disease Sensitivity</td>
<td>Sensitive to yellow dwarfs, sheath blight, rice blast, bacterial blight</td>
</tr>
<tr>
<td>Pest Sensitivity</td>
<td>Sensitive to brown plant hopper, case worm, leaf folder</td>
</tr>
<tr>
<td>Drought Sensitivity</td>
<td>Sensitive, water demanding</td>
</tr>
<tr>
<td>Inundation/acidity Sensitivity</td>
<td>Strong and high stem, suitable for inundated and acid soil areas</td>
</tr>
<tr>
<td>Weather sensitivity</td>
<td>Cold resistant</td>
</tr>
<tr>
<td>Seed spare possibility</td>
<td>No</td>
</tr>
</tbody>
</table>

**Quality, Storage and Distribution**

It has been recorded that hybrids are more sensitive to pests (brown plant hopper, case worm, leaf folder) and diseases (rice blast, bacterial blight) while the varieties are less sensitive,
except their sensitivity to stem borer and sheath blight. The surveys in Yen Binh and Van Yen districts have shown the excessive usage of N fertilizer (either organic or non-organic) and transplanting at high density should be the reasons for such sensitivity which suggest the effort, necessary for enhancing the extension of cultivating techniques.

People normally buy hybrid seeds from the distribution network of the province’s Seed Center. However, the survey in districts has recorded farmers’ complaints about the quality of hybrid seed supplied and their expectation of new varieties with good eating quality and yield and high resistance to pests and diseases. As common practice, people spare and exchange the varieties amongst themselves, leading to the variety degeneracy problem. In some better organized places (such as in Dai Phac commune – Van Yen district), the seed, after harvest, are plucked by the machine, dry on the sun and kept in the jute bag or wooden trunk in individual households up to max. 8 months (due to woodworm attack). In principle, even in such well organized places, people still lack of appropriate equipment for post harvest processing: plucking machine, grain moisture tester, drying facility, storage facility.

Seeds Center of Yen Bai province has a storage system of satisfactory technical standards for storing the seeds (long term and short term) with capacity of 500 tons. The Center’s production system includes 4 farms and stations which provides approx. 150 tons of hybrids F1 (37.5% of province’s demand per season) and 85 tons of varieties Khang Dan 18, HT1, Chiem Huong (17% of province’s demand per season). The Center has also a fairly wide distribution network in the province and only 01 cadre, trained and obtained certificate for Field Inspector but she is looking for her pension in one year. The reason why the Centre production still accounts for low stake in the total province’s seed supply is imbedded in the limited land available as property to the Center and the competition of other seed suppliers (Agro-Material Supply Company). In future, the Center has policy to maintain production on 100ha for hybrid F1 seed (equal to 500 ton/year) and 10 ha for varieties (equal to 100ton/year) as its own production. For such target, the Centre will try strengthening the cooperation with farmers (on the land renting basis) for expanding the seed production/supply source, again with emphasis on hybrid production.

### 2.1.3 In LAO CAI province

**Land**

The province’s topography is mainly mountainous; some lower areas are flat. The precipitation in province is of 2,000 – 3,000 mm/year where the main volume falls in summer season, causing frequent flash flood, landslides and erosion. Damaging coldness, hail and drought are other natural risks. Annually, the landslides and flash flood cause the province’s loss of 40 – 50 hectares of cultivating land especially in the low areas which might/or might not be reclaimable. In the dry season (winter – spring season), the irrigation system secures sufficient water for only approx. 60% of rice cultivating areas while in Summer season, it may achieve up to 75% as the best. Due to the drought, some mountainous areas can cultivate only 01 called “highland spring” rice season which starts from April – October.

The province cultivates in winter – spring season 8,788ha of wet rice (84% are with hybrids and 16% with varieties), 300ha pluvial rice and almost 10,000ha of maize; and 18,237ha of wet rice (25% with varieties and 75% are with hybrids) and more than 11,000ha of maize in summer – autumn season. The average rice yield is of 5.5tons/ha. The province’s policy aims at (i) increasing the rice cultivated areas by 2,600ha (for winter season) and 2000ha (for summer season) (ii) try to achieve 02 rice harvests for high – land spring rice season by using short
terms varieties and/or hybrids (iii) the ratio hybrids/varieties will be 80/20 (for Winter – Spring) and 70/30 (for Summer – Autumn).

**Seed usage**

Annually, Lao Cai needs approximately 750 tons of rice seeds where as 600tons are supplied by the *Lao Cai Center of Agriculture & Forestry Seed Variety* and the *Company for Agriculture Materials* and the remaining 150 tons are spared by the farmers.

The varieties (HT1, Bac Thom 7) and indigenous varieties (Seng Cu, Khau Nam Xit,) currently account for only 16% of total rice area (in spring season) and 25% (summer season). The varieties HT1, Bac Thom 7 are suitable to local cultivating conditions and require, compared to hybrids, less investment (fertilizers, agro-chemicals etc.) and provide average yield of about 5.2tons/ha (in Son Hai commune, Bao Thang district, the average yield reaches even 6.1 tons/ha). The indigenous varieties have lower yield (approx. 3 – 3.5 tons/ha), but thanks to very high price of commercial grain (up to VND 13-14K/kg) due to very special quality, making the rice famous as specialty on the stands of supermarkets. As a practice in the high mountainous areas, the ethnic people prefer indigenous varieties and they sow it for 50% of their rice field. The turnover varies from VND 33 – 49 millions/ha; the gross margin/ha is 60 – 100% higher than the hybrid. According to the survey in Muong Vi commune where people use Send Cu, the indigenous variety imported from neighbouring Muong Khuong district, there is some symptoms of degeneracy of this valuable variety which requires the efforts to revigorate.

The hybrids (whereas the Chinese imported accounts for approx. 70% of the total amount sown) account for 70% (in summer season) and 84% (in spring season) of rice cultivating areas, especially in lower areas. The hybrids require more intensive cultivation. The rice derived has lower eating quality, compared to varieties. The turnover is from VND 24 – 30 mns/ha and the gross margin varies from VND 16 – 22 millions.

<table>
<thead>
<tr>
<th>Name</th>
<th>Hybrid</th>
<th>Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nhi Uu 838, TH 3-3, Sau Uu (Chinese), VL20, LC25, LC212 (Vietnamese, produced in the production farms of the Seed Center of province)</td>
<td>Seng Cu, Khau Nam Xit (indigenous, specialty), HT1, BT7</td>
</tr>
<tr>
<td>Seed price</td>
<td>VND 40,000 – 50,000/kg</td>
<td>VND 10,000/kg</td>
</tr>
<tr>
<td>Sowing dosage/ha</td>
<td>30kgs</td>
<td>60kgs</td>
</tr>
<tr>
<td>Cultivate period</td>
<td>Strict application</td>
<td>Flexible application.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shorter, suitable for summer season</td>
</tr>
<tr>
<td>Yield</td>
<td>5.5 – 6.0 tons/ha</td>
<td>3.0 – 3.5 tons/ha for indigenous 5.5 – 6.1 tons/ha for HT1 and BT7</td>
</tr>
<tr>
<td>Eating quality</td>
<td>Average</td>
<td>HT1, BT7: good quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indigenous: Specialty rice quality</td>
</tr>
<tr>
<td>Market value</td>
<td>VND 4.5 – 5.0 millions/ton, for feedstuff</td>
<td>VND 7.0 millions/ton (for HT1, BT7) and VND 14 millions/ton (for indigenous)</td>
</tr>
<tr>
<td>Disease Sensitivity</td>
<td></td>
<td>Resistant</td>
</tr>
</tbody>
</table>
Quality, storage and distribution

The varieties have following advantages: (i) higher adaptability to impoverished soil (ii) seed can be spared for next 2 – 3 seasons (iii) much higher eating quality ensures higher market value and margin.

From the year of 2000, the province started “seeds production” programme for producing both hybrid and inbred varieties seeds in which the main implementer is the Lao Cai Center of Agriculture & Forestry Seed Variety. The programme has two-fold target: to maintain and develop the production of indigenous varieties for commercial purpose and to produce the hybrid seeds (in cooperation with resources for food security purpose. The “seeds producing areas” have been planned in the districts of Bao Thang, Bat Xat, Van Ban (for hybrids) and Muong Khuong district (for varieties and indigenous special varieties). The task of the Center is to produce annually 300tons of seeds (60% of hybrid and 40% of varieties). In the year 2009, the Center produced 315 tons of seed (260 tons of 2-lines crossed and 3-lines crossed hybrids 55 tons of varieties). The Center latest hybrid LC25 has been acknowledged/certified by the MARD. The Center has 3 stations located in Bat Xat district (for rice seeds), Bac Ha district (for vegetables seeds) and Sapa district (for temperate horticultures). Its processing lines, located in Lao Cai city (capacity of 350 tons/year) and Bat Xat (capacity 300 tons/year) include: 4 drying ovens (capacity/each of 40 tons/batch/24hrs), yard of 1,000m², 6 warehouse with total capacity of 400tons constructed in accordance to TCVN (Vietnamese Standards, specified by MARD) and 02 air-conditioned warehouses (total capacity of 40 tons). As plan, another warehouse facility will be built very soon in Van Ban district with capacity up to 600 tons. The Center has a well-equipped laboratory, suitable for seed testing, but still lacks of appropriate technical experts for operation. Also within the programme, the Center is implementing pilot pattern (for supporting the varieties seeds production and spare at farmers houses) where the Center provides the farmers with foundation seeds, a part of fertilizers needed and technical assistance. The ultimate goal of this programme is to increase the varieties seeds accumulation at farmers’ families and to enhance their preparedness in case of disaster. With such processing and storage capacity, in principle, the Center is capable to accommodate the seed demand/buffer of the province. Although the warehouse system is belonging to the Center, practically, the province is equipped with adequate storage system down to the district level.

2.2 Potential for introduction of new crops, varieties and the development of community based seed production and storage systems for preparedness and disaster mitigation.

Economic efficiency: despite huge amounts of investment from state budget and the farmers have been spent in many years for promoting the hybrid seeds, the yield per hectare and the ultimate goal (revenue/production and margin per household) derived from hybrids remain almost indifferent from the varieties ones. Meanwhile, by using the varieties, the reasonable efforts of the farmers (cultivating investment and appropriate techniques application) will ensure an average yield at least as good as the one of the hybrids which means higher margin of the commercial food grain.
Necessity to strengthen preparedness at household level upon natural disaster risk. The use of hybrids expose the farmers to the risk of too much dependence to the importation of hybrid seeds, mainly from China (which is qualitatively and quantitatively very unstable), and the farmers cannot spare (or do not want to) the seeds. This means the resilient capacity of the farmers after the disaster occurrence will be almost nullified. Actually, this weakness has been identified through the TCP VIE/3202 of FAO in 2009.

The climate change and its adverse effects (drought and inundation) has imposed the necessity of introducing new varieties which are: (i) resistant to drought (winter – spring season) and inundation (summer – autumn season) (ii) short cultivating term, suitable for summer production so that the farmers can harvest before intensive flood and inundation come along the heavy rain time (in September – October) (iii) with fairly good or high yield, of good eating quality, i.e., high market value of the commercial food grain. It is obvious that the hybrids can be suitable only for the low/flat areas. There are good varieties (BT 13, HT1, and BT7) available as pre – foundation (or even source seed) seeds from NOMAFSI.

In the areas with steep topography and fast growing cassava production, there is an emergent demand for application of new technology for sustainable cassava production or slope technology, aiming to protection of the steep terrain from land erosion and degradation. Slop technology is hoped to be as solution against landslides phenomenon in mountainous areas.

Technology/techniques for varieties seeds/grain production is not so sophisticated/difficult, affordable in the sense that requires just some training for the farmers and their efforts to apply what they have been taught. Such training capacities are available from the central level (Crop Department of MARD) to ground level (NOMAFSI) for individual capacity strengthening for the farmers.

Taking into account the average size of rice cultivating land in each commune (100 – 150ha) and the ratio of land, suitable for cultivating the varieties, it is concluded that each commune just needs to select 1 – 2 hectare(s) in the safe area for seed production group. The total seed production from the land of such size can easily be accommodated in individual households. Thus, each commune automatically has an on spot natural seed storage. The pattern of seed production group has been implemented in 2008 through the TCP VIE/3101, but only in Yen Bai province and just purely field technical assistance, not yet thoroughly tackling the issues relating to capacity for post harvest processing, marketing the products, etc.

The idea to introduce again new varieties through the seed production group has gained support from various local authorities, notably from district and commune levels. This political support is important in the sense of promotion/propaganda for varieties usage. This process will get the Seed Centers and Extension system and the farmers involved. The extension activities, i.e., the institutional capacity will be strengthened through conducting “field – school” training of production technology for farmers at the Seed production Group of the commune.

The Seed Centers have expressed their willingness to participate in the long run in the process under the form of capital advancement for the Seed production Groups at commune level, post harvest technical assistance and marketing services. The Seed Center (having storage facilities, marketing and technical knowledge/experience of the staff) and the farmers (with the land as invaluable assets) will engage into “win-win” linkage. In the communes with more availability of land suitable for seed production, the size of seed production group may be extended so that they become variety seed production satellites for the provincial Seed Center. The warehouse systems of the Seed Centers, located in few districts will be really the seed buffers of the province as preparedness upon the disasters occurrence.
2.3 Training programmes for capacity building.

2.3.1 Certificate Training

According to legal stipulation of MARD, it is mandatory that all the seed products are subject to the certification of the field inspector and to the laboratory testing before being authorized for circulation and trading in the market. Taking into account, that in all 3 provinces, there is only 01 certificated field inspector (who is about to retire). In addition, all the seeds so far have to be sent to the National Centre for Seed Evaluation (within the Crop Department of MARD) for laboratory testing. This is costly and time-consuming while a seed testing laboratory with some basic equipment is available in Lao Cai province without the technical expert for operation. Recognizing such big technical and legal gap in capacity for seed production of those provinces, it has been recommended the following trainings (with certificate awarding for qualified trainees):

- Field Inspector and Seed production training (in province)
- Sampling techniques training (in province)
- Laboratory Testing Techniques (in National Testing Laboratory – Hanoi).

Result: A 4-days training course (from 23 – 28 May, 2010) on topics “Rice varieties Seed production” and “Field Inspection” was planned for 21 participants from DARDs, provincial Extension Centers and Seed Centers. Finally, 27 trainees (including 6 extension staffs from 6 districts where the demo sites were selected and 5 staffs of NOMAFSI) participated in the course, led by the instructors/lecturers from the National Center for Seed and Fertilizers Testing (belonging to Crop Dept. of MARD). The Center is the only organization with function, delegated by MARD, for teaching in such specific training. The consultant also presented issues for seed production in the northern mountainous provinces relating to disaster risk management capacity. At the end of the course, all trainees passed the test with score from 6.5/10 (1 person) to 10/10 (2 persons). Each trainee still have to do the field inspection for 100 hectares without any mistakes so that to be officially awarded with National Certificate “Field Inspector” and Professional Practice Code Number. The success of this course, with the trainee range extended down to district extension station, is meaningful for strengthening the seed production system of those 3 provinces and for NOMAFSI as well.

Suggestions:

- The project will further consider and approve 2-days training course on Sampling Techniques for field inspector
- It is very important the 1–3 months training course in the National Center for Seed Evaluation in Hanoi on subject of Laboratory Testing Techniques to be provided to selected staff of Lao Cai Seed Center so that they can efficiently operate the existing Laboratory. This would be very good investment (in the sense of seed quality maintenance) of the project to gradually convert this Laboratory into a Regional Laboratory, servicing for the seed evaluation (as one of the key procedures in seed production process as above mentioned) for the Northern mountainous provinces.

2.3.2 Training for extension staff (district and commune level) and farmers

The following topics have been identified by the consultant for training for selected farmers who are members of commune seed production group (demo sites) and extension staff from district and commune level:
- IPM in rice production and advanced cultivating techniques for rice production using varieties
- Seed production technology for new short term and high quality varieties, resistant to drought and inundation.
- Revigorate degenerated variety
- Application of slope technology in mountainous/steep terrain areas.

NOMAFSI is responsible for conducting numbers of 1-day field-school trainings in all the 6 communes of demonstration; for which, the training topic fits to each actual action according to cultivating calendar of the locality. For example, in June, when farmers started new production season (summer – autumn), the training topic was: sowing technique (using lesser seed amount – 50kg/hectare in stead of 60 – 70kgs/ha), transplanting using single seedling at lower density, eliminating the impurity at seedling stage. Participants have been not only farmers but also extension staff from district and commune level. This has as purpose to stimulate the project ownership of the extension staff at grass root level, upgrade their technical knowledge as well as rising their awareness about the necessity of using varieties for seed production as measure for achieving the preparedness for natural risk management.

The trainings under the forms of field-school will continue pacing along the cultivating calendar at the same communes.

2.4 Set-up and maintenance of demand responsive seed buffer and supply system at the commune level on continuous basis

2.4.1 Demonstrations set – up.

The concept “commune – based” seed production group has been introduced first in the TCP VIE/3101 only in the districts of Van Yen and Van Chan (Yen Bai province), but not yet in the provinces of Phu Tho and Lao Cai. Also, the activities of this project concentrated in trials for rice cultivating techniques: optimal fertilization formula, transplanting density, identification of certain most suitable varieties for the northern mountainous areas.

The assessment in 1.1 has identified numbers of issues relating to establishment and strengthening of the local seed production system and agriculture system for DRM:
- Changing the farmers’ perception of technical and economical significances of varieties in rice production for coping with natural disasters;
- Introduction of new varieties with good to high quality and high yield for more profitable market value and at the same time to be suitable for coping with drought and inundation, resistant to pest and diseases.
- Dealing with emerging technical issues: variety degeneracy, misuse of fertilizer, IPM for rice production, lack of appropriate slope technology for sustainable cassava production in steep terrain areas.
- Maximizing the income per limit unit of land available as property of each household for the purpose of food and seed security. This in turn requires:
- Improvement of linkage between the trader (Seed Centre) with the groups of farmers; enhancement of extension system for involvement in technical support to the farmers, and, the most important, changing the perception of governmental bodies (provincial level) about rationalizing the seed usage, i.e., hybrids/varieties for coping with the natural risks.

The demonstrations for commune – based seed production groups, implemented within the framework of this undergoing project, have focused on solving the above mentioned issues for
strengthening the preparedness for DRM in conjunction with the provincial seed supply system. Seven (7) locations have been selected (instead of 6 locations as planned by the project document) and proposed to FAO for implementation. Crops involved have been rice seed (varieties) and cassava production. The reason for the change in number of demos is due to the fact, that the cassava production in the mountainous commune of Lam Giang (Yen Bai province) is becoming intensive trend of the farmers, which, without appropriate and sustainable technology, gradually exposes the area to further dangers of severe soil degradation/erosion and landslides. It has been recognized that the necessity of slope technology does exist in other steep terrain areas as well.

The key factors taken into account when selecting the sites for the demos are:

- In all three provinces, key cash crops are rice, corn, cassava and tea, followed by little of vegetables. For corn cultivating, farmers use only hybrid seed, imported from other areas. Tea and vegetables cultivation depends much to the market mechanism available. The most practical crops to be considered in this project are rice and cassava.

- The size of demo is to be 01 hectare, taking in consideration the average size of rice cultivating land per commune in these northern mountainous provinces. *(Further explanation in Section 4 – Strategy for seed production, storage .... Page 18.)*

- The sites should be located in the safe area and easily to be converted into a seed hub for the commune.

- Near by the main traffic way of the commune so that the field can service as field – school for promoting the varieties usage to other farmers.

The issues to be solved relating to the demo implementation are:

- **Technical issues:** (i) the variety’s suitability to cope with drought and coldness (in winter – spring season) and its short growth period for avoiding inundation (in summer – autumn season), its resistance to pest and diseases (ii) Application of slope technology for sustainable cassava production in mountainous areas against soil erosion, degradation and landslides.

- Enhancement of local extension capacity, the farmer’s knowledge improvement through field-school training on using varieties seed for rice production.

- Gradually enhance capacities of seed production group(s) in post harvest processing and storage (which in turn improves their product’s marketability and secures the quality seed buffer for local rice production) and marketing power.

- Maximize the income per limit unit of land available as property of each household by using variety with “special” quality such as Seng Cu and to improve the involvement of the provincial Seed Centre for the purpose of strengthening their linkage with farmers groups in seed production, distribution and storage for coping with disaster risks.

More details of implementation of seed production groups are described in Annex 3 – *Why do we need those demonstrations?*

**Results achieved:**

- The seed provided by the project to the groups for the demo implementation are of “foundation” grade. The seed produced by them are “Certified Grade 1”, suitable for seed purpose (in accordance to the MARD regulations). Especially, the seed produced in Dai Phac commune (Van Yen district, Yen Bai province), has been certified by National Field Inspector of "good quality for marketing nation wide")

- The trainings have been provided by NOMAFSI to local extension staff and farmers who are members of groups *(See in 2.2 - Training for extension staff (district and commune*
level) and farmers). The trainings are highly appreciated by the farmers thanks to concrete and practical teaching content. Especially, the local authorities and extension staff highly appreciate it from the aspects, that it enhances their extension skill/knowledge and, that such training, for the first time involved also the local staff, would create their ownership toward this project.

- In Dai Phac commune (Yen Bai province), thanks to the satisfactory field production, as the result, in the last season, the provincial Seed Centre has started negotiation with the group for procurement of 30 tons of seed. The pending problem is how to secure consistently the adequate quality of the seed while the group is lacking of necessary equipment for post harvest processing. It is recommended the investment for this demo site from FAO/UN project in this summer season to focus on levelling the group’s capacity up to this stage of seed production, namely in procurement of one seed sorting machine and one grain moisture tester. It is also recommended that other 5 demo sites to be provided with one moisture tester each. (See Annex 4 – Why Dai Phac needs Grain Sorting machine and grain moisture tester?)

- Due to shortage of budget, the proposed extra demo for slope technology in Lam Giang has been cancelled for this year and hopefully to be implemented next year. However, land erosion/degradation and land slides are very common natural disaster risks in the steep terrain areas where the ethnic people are actively developing the cassava. Investment effort of the FAO/UN project to introduce the slope technology, created by NOMAFSI (and already approved by MARD) in this demo will certainly be helpful in educating people how to minimize the impact of these types of natural risk.

2.5 Indigenous method of seed storage with farmer cooperatives and farmer groups at local level

The grain to be used as seed is separately harvested and dried on the sun for about 1 – 2 days on the bamboo mat or in broad flat drying basket. The seed should be dried to the moisture content around 13%. The number of days to dry is subject to whether it is the dry period (harvest in May – June) or rainy period (harvest in late August – early September where it might be 3 – 4 days) and depending to the sun radiation on that day. Normally, due to the lack of appropriate grain moisture tester, the moisture content of the dried seed is defined very subjectively by the personal experience of the farmer when he/she bites the grain and judges it. After drying, the seed is kept separately in dry, safe and well ventilated place at individual houses, but not in common warehouse as it used to be in the old days when the former cooperative model existed. The most common container for seed storage is jute bag or woven plastic bag, lesser amount kept in wooden trunk or iron drum. In such very primitive storage facility, the seed can be stored up to 6 – 8 months. In between, the farmers dry it once in a while, after a long and heavy rain. After this period, farmers can use it as high quality food grain.

This common practice has some disadvantages:

- The most appropriate moisture content cannot be defined exactly as required
- The storage time is short due to the woodworm attack and the seed in always under the influence of the air humidity and temperature.

The advantages of storing the seed at individual houses are:

- Higher flexibility to evacuate the seed upon disaster (flood).
- Easily manageable storage due to practical household conditions
- Costless.
2.6 A proposal for Strategy on Seed production, Storage and Maintenance

(In accordance with the national policies, plans and priorities and implement acceptable and preferred models at different levels).

The strategy for seed production, storage and maintenance might be adjusted in each province, subject to the size of province’s rice cultivating area and its natural conditions, seed usage (ratio of variety/hybrid) policy of that province. The ultimate goal of the strategy is to strengthen the 4-pilar system: Government – Business – Scientists – Farmer. The strategy has 2-fold goal:

a. To ensure continuous seed supply for the purpose of DRM: To meet the communal demands of food security (high yield/quality varieties in low/flat areas and maximizing income from specialty indigenous varieties in high/mountainous areas) and seed security which in turns will strengthen the preparedness and resilience of the local people and agricultural system with regard to the disaster risks management.

b. To maintain the seed quality in the region: By establishment of inter-provincial seed production/supply network which involves the research institution such as NOMAFSI, the provincial seed centres (and their satellites), back-up by a team of certificated field inspectors and a Regional seed test laboratory located in Lao Cai Seed Centre.

The strategy targets mainly at 2 levels: communal and provincial.

At commune level: development of commune-based seed production group which is functioning either as (i) seed hub for the commune or/and (ii) seed production satellite for the main seed distributor of the province which is the Seed Center.

Average size of the rice production area in each commune of the North is about 150ha. Given the seed usage policy whereas 40% of the area are dedicated to varieties growing, i.e., 60ha, then the seed (certified grade 1) amount required is 60ha x 60kgs = 3,600kg. This amount equals to seed production from 1 hectare. As the seed hub for the commune, each commune just selects 1 – 2 hectares in safe location with good condition for seed production. The input seed (about 30kgs of foundation quality) will be supplied on the regular basis from the Seed Center. The seed produced is of “certified grade 1”. Seed harvested will be stored in individual houses of the group members for exchanging with other farmers. By this, the seed produced will be of stable/controllable quality, easily to be stored at highest flexibility.

In the commune with more favourable conditions (such as in the case of Dai Phac, Yen Bai), the size of seed production group will be expanded to dozen hectares or more. At the moment, the group is producing seed of Certified Grade 1. In the shortest time possible, NOMAFSI, together with the provincial Seed Center will provide further technical assistance so that the group will be able servicing as foundation seed producing satellite for the Seed Center, using as input the pre – foundation seed from NOMAFSI.

At provincial level: Strengthening the capacity and roles of Seed Center and the Extension system.
Considering the role of the provincial Seed Center as key implementing body for provincial policy on seed usage, the strategy foresees a part of seed subsidizing budget, allocated from the provincial authority to the Seed Center, and its trading capacity to be deployed for the following functions:

(ii) Foundation seed supplier for smaller commune seed production groups for Certified seed Grade 1 production

(iii) To support foundation seed production of the satellites (advance the investment for necessary post harvest and packing equipment, supply pre-foundation seed, pre-contracted product buy-back on the "win-win" basis)

(iv) To accommodate and regulate the seed from the satellites for maintaining the continuous supply of good quality variety seed and buffering in the case of disasters and emergencies.

(v) To transact with research institution(s) such as NOMAFSI on the market-oriented principle for: procurement of pre-foundation seed, place order to the institute for further researches on new varieties/new farming technology applicable for the province’s conditions and to support financially the extension system for transferring the technology to the farmers.

(vi) To assist maintaining the seed quality and trading of indigenous specialty rice (Seng Cu, Khau Nam Xit) from farmers for maximizing their income for the purpose of food security in high mountainous areas with limited rice cultivating land such as Lao Cai province

(vii) To transact with other Seed Centers of the neighbouring provinces for seed production and trading so that gradually to establish regional seed network.

In each province, subject to the size of cultivating areas with varieties, it is necessary to develop few satellites, linked with the Seed Center so that to form a seed production/buffer network for the province. The technical capacity of the seed production network gradually will be strengthened. In this process, the extension system and the team of Field Inspectors, trained from FAO/UN project will play key role in seed quality maintenance while (i) the extension staff will more actively get involved in providing consultative recommendation on cultivating techniques, varieties option to the farmers, especially those who are the member of the commune seed production groups (ii) the quality of seed produced from the groups to be under strict control of Field Inspectors and the Regional Seed Testing Laboratory in Lao Cai.

The pre – basic seed will be supplied from NOMAFSI for replacing old lot for the purpose of controlling the degeneracy problem.
- According to the province’s policy on see usage (varieties account for 40% out total demand), Yen Bai province needs 450 tons of varieties seed of grade “certified grade 1”, produced from foundation seed. Assuming for seed purpose, the total amount of grain, qualified as seed and harvested from one hectare is 4.4 tons/ha (80% out of total production of 5.5 tons per 1 hectare). So, the production for 450 tons should be deployed on about 100 hectares of seed hubs (satellites)

- For each hectare we need 30kgs of foundation seed. In total we need 100 ha x 30kgs = 3,000kgs or 3 tons of foundation seed

- For having 3 tons of foundation seed, we need to produce on 2 hectares from pre – foundation seed (with assumption we harvest 1.5 tons/ha).

- Each hectare we need to use 30kgs of pre – foundation seed, i.e., for this province, we need 60kgs of pre – foundation seed. This amount can be supplied by NOMAFSI.
3. Conclusions and Recommendations

4.1 Conclusions

The good varieties, available for seed production in 3 provinces: Chiem Huong, HT1, BT13, SH14, BT7, T10, TL6, Seng Cu, have following advantages to hybrids:

**Technical:**
- High yield, lesser cultivating input required (especially BT13), simple cultivating techniques affordable by the farmers in mountainous areas
- Good resistance to diseases and pest (BT13, TL6, SH14), to drought (BT13) and to coldness (TL6, SH14)
- Short cultivating term (TL6, BT13, SH14) which is suitable for late winter (to avoid drought and coldness) and early summer (to avoid flood and inundation) production seasons as well as reserved seed for emergencies.
- Wide adaptation (HT1, Chiem Huong)
- Possibility to spare seed

**Economic:**
- High yield, good to high eating quality and high market value of commercial food grain (50 – 100% higher than hybrid)
- The indigenous Seng Cu variety with outstanding special quality and suitability to the impoverished land is suitable for specialty rice production in mountainous areas of Lao Cai province where, for the purpose of food and seed security, maximizing the revenue per limit land owned by each household is definitely more important than maximizing the yield.

**For DRM and Food Security:**

In the Northern high mountainous region of Vietnam, varieties seeds with wide adaptation, reasonably high yield and good quality are most suitable for food security. Thanks to resistance to drought, coldness, pest/disease, the short cultivating term and notably the possibility to spare seed, they are definitely best solution in the context of DRM for agriculture in the region.

The seed production groups, set up in 7 locations as natural seed storage at commune level which are now still under the implementation for the second season, have as objectives:

- To strengthen the farmers preparedness and resilient capacity against disaster risks.
- To establish the basis for continuous seed production and supply network between the farmers and the provincial seed centers.
- To establish as pilot the multi-aspect (technical, financial, trading and marketing) cooperation between the provincial seed center and its satellite (seed production group)
- To strengthen the technical capacity of extension system that has been suppressed for decade by hybrid supply activities.
- To launch the appropriate slope technology in steep terrain areas with intensively expanding cassava production in order to minimize the soil degradation/erosion and landslides.
The successful certificate training programme, provided to selected staff of DARDs, provincial Seed Centers, extension staff at provincial and district level and staff of NOMAFSI, on the subjects of seed production, field inspection and storage, has tackled very important weakness in the seed production system of these provinces – the lack of qualified field inspectors, and contributed remarkably in capacity building for the region.

The field-school trainings provided to district and commune extension staff and selected farmers of seed production groups helped: building awareness of varieties usage as solution for DRM and food security purpose; consolidating the farmers’ knowledge of seed production. It also helped building up the commitment and ownership of local authorities (district and commune level) and the extension staff with regard to the project implementation.

The provincial Seed Center plays very important roles in:

I. establishing the seed production, storage and maintenance network for implementing the provincial seed policy
II. providing financial, technical and commercial support for grass root seed production group
III. financially supporting the provincial extension system, in addition to the state budget allocated to this system which is practically not sufficient
IV. networking with other Seed Centers and research institutions for developing and maintaining an efficient Regional Seed production and Supply for the purpose of DRM and Adaptation to Climate change

These roles/functions have been distorted to different extents in each province by the seed subsidizing policy in the last decade. It is time-consuming process, requiring further efforts to restore the real functioning of the seed centers

The proposed strategy for seed production, storage and quality maintenance for the Northern mountainous provinces will be targeting at two main levels: communal and provincial The 2-fold goal of the strategy: ensuring continuous seed supply for the purpose of DRM and maintaining the seed quality in the region can be achieved through strengthening the 4-pilar linkage: Government (DARDs/Extension system) – Business (Seed Centers) – Scientific (NOMAFSI) – Farmers (Seed Production groups) and through establishment of inter-provincial seed production/supply system, backed-up by a technical team of well trained field inspectors and a Regional Seed Test Laboratory located in the Seed Center of Lao Cai province.

4.2 Recommendations

The UNJP/VIE 037 UNJ project will support two more trainings: 2 – 3 days training on Sampling Techniques in either province of Phu Tho or Yen Bai (for the same trainees from field – inspectors training programme) and 1 – 3 months training on Laboratory Testing Techniques in National Centre for Seed and Fertilizers (Crop Department of MARD) in Hanoi (for staff from the Seed Center of Lao Cai province). The aim of trainings is to completely build up the capacity for seed quality control for the region from human resource and laboratory technical basis.

The project will support implementation of the slope technology in Lam Giang commune (Van Yen district, Yen Bai province) as solution against soil degradation/erosion and the risk of land sliding.

The project will further provide with at least 01 Grain Moisture Tester for the remaining 5 demos sites in 3 provinces (except Dai Phac commune in Yen Bai province)
As the demos are still under the implementation (the harvest of the summer – autumn season will only be in September due to the delay in cultivating calendar as consequence of recent severe drought), there should be further monitoring and evaluation (M&E) on:

I. Activities and lessons to be learned from the grass root (commune) and ground (provincial) level for mass duplication within time frame of UNJP/VIE 037 UNJ project’s implementation as well as for further adaptation to coordinating activities in other future projects relating to Disaster Risk Management and Adaptation to Climate Change at Central Government level (MARD, DMC for example.)

II. Activities and lessons to be learned relating to strengthening the 4-pilar system, with emphasis on how to more actively get the provincial Seed Center involved for fulfil its functions and roles as mention in above proposed strategy, for the purpose of DRM and Climate Change adaptation in Agriculture

III. Impacts of the Agriculture component, including Seed production, Storage and Maintenance, onto the political (including the Central Government – MARD level), institutional and individual capacity building in the context of DRM and Adaptation to Climate Change.
Annex I. Surveys conducted in 3 provinces during January – March 2010

Broaden the household survey (increase the number of respondents and communes) to understand the overall picture about the seed resource situation at the community level at different phases of Disaster Risk Reduction and document the synergies, trade-offs and economics of hybrid, improved and local varieties.

1. PHU THO PROVINCE

26/1/2010.

**DARD of Phu Tho province** – Md. Tran Thi Thuy, Manager, Crop Department. 0982765215. (Tel. 0210. 3841201 Fax. 0210. 3846764)

The province has subsidy programme for hybrid seed and varieties foundation seed for upland areas and foundation seed of high quality varieties for lowland areas. The seeds are distributed mainly through the outlets network of the Seed and Plants Center of the province and through the extension network (down to the district and commune level). In 2009, the ratio has changed to 46/54 due to the quality drop of the seed imported China while the price has been very high.

For winter-spring season, the low land areas use mainly seed of high quality (eating quality) varieties, lesser of hybrid. According to the survey in 2009, number of hybrids have shown inferior result compared to varieties.

The seed center of the province is producing pre-basic seed. The province policy is as follows:

1. The super seed is to be provided by the research institute (NOMAFSI). Then the foundation seed will be produced by the farmers
2. The seed to be produced at the community level

Training demand: to be provided to DARD’s and Seed Center’s staff.

- Training on process for producing from pre-basic seed to basic seed
- Rehabilitation the storage system.

**Interview in LIEN HOA commune, PHU NINH district.**

*Mr. Vu Hong The*

The family is cultivating 3 sao (1 sao = 360m2) of Khang Dan 18 variety for winter-spring season. The yield is approx. 5 tons/ha. For summer season, they cultivate 1.7 sao of BT13 which is short-term variety (90-95 days) and gives the yield of approx. 4.2 tons/ha. They also cultivate 1.3 sao of variety HT1 (yield of approx. 4.1 tons/ha). The farmer comments: the hybrid is resistant to acid soil but the eating quality is bad. They source the seed from the cooperative.

Training need: IPM production, production technology for reasonable seed structure, techniques for seed purification. They normally keep the seed in the wooden trunk.

**Interview in DOAN HUNG district** – Mr. Nguyen Hoang Minh, Chief of Division of Agriculture and Rural Area Development (Tel. (0210) 3880274, fax. 388084)

The ratio varieties/hybrids in the district is 70/30.

Most common used varieties are: Q5, Khang-Dan 18 which provide average yield of 4.7 – 4.8 tons/ha (Winter-spring season).

The hybrids are: Bo Tap, Thanh Xuan are 2 lines-crossing, imported from China, used for Summer season and give the yield of 5 tons/ha. These hybrids have extended growing period
(by 20 days) which caused negative effect to the; Nhi Uu 7, 838, Thuc Hung, Thien Nguyen Uu 16 (imported from China) and Syn 6 (from Syngenta), used for winter-spring season and give the yield of 5.6 tons/ha.

The district has 15,000 ha of winter maize (from beginning of September till 15 January). The hybrids used are: NK 66, NK 4300 (from Syngenta) CP 999, CP 888, CP 989 (from Thai CP group), VL99, VL4, VL10 (Vietnamese). Average yield is of 4.5 tons/ha. The spring maize (from 25 January till middle May) of 400 ha has highest yield (> 5 tons/ha). The summer-autumn maize (end of June till September) of 100 ha has lowest yield (< 4 tons/ha). The imported seeds are sold at VND 60K/kg; the Vietnamese seeds are of VND 30K/kg. Corn seeds subsidy is of VND 10K/kg.

**Interview in Chan Mong commune, Doan Hung district.**

*Mr. Dinh Vuong, Chairman of the People’s Committee*

The commune is located in the area, affected by drought and flash flood district and also received donated seeds from FAO programme TCP VIE/3202. Their total rice cultivating area is of 97 hectares; also cultivate 15ha (in spring season) to 30 ha (winter season) of maize.

The commune used to use Khang Dan 18 and Q5 (old varieties) which give the average yield of 5.2 – 5.3 tons/ha. The new variety BT13 (new variety, introduced by NOMAFSI) is pest and disease and drought resistant and gives the yield of 5.5 – 5.6 tons/ha.

The hybrids (Bo Tap, Xuan Thanh, imported by the province’s Seed Center from China) during the last 2 production seasons have shown severe quality failure.

The cost for seed production is 30 – 40% higher than for production of consumable rice which require a suitable mechanism to ensure a selling price approx. VND 2,000/kg higher which gives the farmer the benefit.

*Md. Le Thi Thanh, Ward 6, Chan Mong commune*

She cultivates 7 saos of varieties rice (BT13, Song Hong 14) which give the yield of approx. 5 tons/ha. According to her, the hybrid is suitable only for the summer season production (when the field is inundated). However, she has to by the hybrid seed from the agents outlets for which, the quality is unstable. As per the very common practice in the commune (and in the country side of this province), the farmers exchange the seed for consumable paddy (1kg of seed for 1.5kg of paddy). After harvesting, they dry the paddy for 2 days (winter-spring season) or 3 days (summer season due to the rain). The seeds are kept for 1 – 2 months in the wooden trunk.

**Interview in Minh Phu commune, Doan Hung district.**

*Mr. Nguyen Thanh Hai, Vice Chairman of People’s Committee*

The population of the commune are mainly of Cao Lan – San Chay ethnics. They cultivate 100ha of winter maize, 187.9ha of winter-spring rice and 191.6ha of summer rice. The commune is located in inundated area. For the winter-spring production season, the hybrids (Nhi Uu 838) account for 60% and give the yield of 5.2 – 6 tons/ha while the varieties (Khang Dan 18, HT1, Q5) account for 40% and give the yield equals to 2/3 of the hybrid’s, more or less acceptable and quite stable. For the summer season, the ratio remains unchanged due to the fact that the hybrid is short-term, which guarantee on-time start up for the next winter season. The yield is equal for both hybrid and varieties. The government subsidy accounts for 1/3 of price for hybrid seed. The seed supply is mainly through the extension system which is closely connected to the Seed Center of the province. However, it has been recognized that the quality of the seeds supplied through this system is not verified, especially when the seeds are from various sources with very unstable quality. The ward 3 of the commune is classified as “poor” in
accordance to the criteria of the programme 135. Though the farmers of this ward have been provided with training services from the extension staff but the quality is not high; there is not new variety and their farming system is dominated by the “hybrid selling system”. After the harvest, the seeds are kept in wooden trunks or in steel barrels.

Training need: IPM system and advanced cultivating techniques.

Mr. Hoang Xuan Bai, Chief of the ward 3, (tel. 01665128382)

The corn hybrids used are 4300, NK 66 (drought resistant), Syn Delta (from Syngenta), VN Lai (Hybrid) 4 which is inundated resistant.

Mr. Nguyen Van Phan, Chief of ward 7

Mr. Phan cultivates 8 saos. He uses: (1) Khang Dan variety seed (purchased at price of VND 15 – 18K/kg), which gives the yield 190 – 200 kgs /sao (Winter – spring season) 170kgs/sao (Summer season) 2.3 – 2.5 ta/sao; paddy is sold at VND 6,200 – 6,500/kg. The variety is less resistant to disease and pests, compare to hybrid and (2) the short term hybrids Nhi Uu 7 and Nhi Uu 838 (purchased at price of VND 60K/kg) which gives 230 – 250kgs/sao (Winter – spring season) and 200kgs/sao (in Summer season) and the paddy is sold at VND 5,800 – 6,000/kg. The hybrids are more resistant to diseases and pests.

Cultivating process: basic fertilizing (300kg of organic/compost; 15 – 20 kgs of NPK; 4kgs of urea and 2kgs of Kali) additional fertilizing (2kgs of urea and 2kgs of kali). The good bunch of ripen paddy to be harvested separately for seed spare.

Normally, the short term growth hybrid is used more in summer-autumn season. However, for the last two seasons, he used the 2-lines crossing hybrids (sourced from the Seed Center) which has had extended ripening period and caused negative consequences to the following winter corn season.

**Interview in Minh Hac commune, Ha Hoa district (28 January 2010) – Mr. Hoang Duc Dat, V. Chairman of the PC of the commune.**

The rice cultivating areas of the commune are of 100 hectares; 33ha out of which are in hollow area and suitable for only 01 rice season, using the hybrids (Nhi Uu 7, Thuc Hung6, Q 5; 67ha are in flat areas and suitable for 2 rice seasons plus 01 winter corn season, using hybrids such as Nhi Uu 7, Nhi Uu 838, Nhi Uu 63, VL 20, VL 24, HT1 and the variety Khang-Dan 18. The hybrids give the yield of 5.4 – 5.6tons/ha while the variety gives the yield of 5.2 – 5.3 tons/ha. The merchandised paddy of hybrids is sold for VND 6mn/ton while the paddy of variety is sold for VND 7mn/ton. There are 3 production programmes:

1/ 0.96ha is reserved for Khang-Dan18 and BT13 seed production, using revolving credit fund, including 17 households. (Continuation of FAO TCP VIE/ 3101).

2/ Using the variety GT 45, introduced by the Central Extension Center for the area of 11ha. This variety sustains to intensive cultivation, resistant to inundation and gives the yield of 6.5 – 7 tons/ha. The rice quality is average.

3/ 3ha for cucumber production for Japanese client. The yield is of 70 ton/ha. Selling price is of 1.3 millions/ton (very low).

For corn production, the local people use DK 999, VL20, and VL4.

**Mr. Nguyen Van Co, Chief of the Seed Production group**

There are 8 extensionists.

The cost for rice of hybrid is much higher than the variety (VND 70K/kg) while the hybrids are less resistant to diseases. Average estimates production cost for one sao (360m2) are: for machines (VND 200K), NPK (20kgs) Urea (7kgs) K (5kgs). As the practice, the farmers keep
the seed in wooden trunk or in the metal barrel. Using the same plucking machine and drying the paddy/seed of various hybrids/varieties are the main reason for seed mixing and impurity.

While 80% of the seeds are purchased in the free market (without quality control), the F1 seed of Khang-Dan 18 is sold at VND 12K/kg while its super seed is sold at VND 20K/kg, the group has difficulty to sell their product. It is believed that the brand building and product promotion should be the keys issues, or in other word, the propaganda campaign must be in place with strong support of the local authority.

Training needs (*) for extensionist: techniques for conducting the surveys and technology for seed production; (*) for farmers: identifying/preventing the diseases/pests and IPM production.

**Interview in Lang Son commune, Ha Hoa district**

*Mr. Nguyen Ngoc Quang, Chairman of the People’s Committee of the commune*

*Mr. Pham Quoc Tuan, V. Chairman*

While for winter-spring season, the commune can cultivate 158 hectares of rice, for the summer season, they have to early transplant the seedling on only 77ha of terrace field due to the inundation, the remaining area is just left idle or used for fish farming.

For the winter-spring season, the most common hybrids used are: Nhi Uu 838; 63; 7 (from China) account for 70% of cultivated land which provide the yield of approx. 5 tons/ha, with the seed sold at VND 50K/kg (with the government subsidy). The varieties used are Khang-Dan 18 and Q5 (seed sold at VND 12K/kg without subsidy) which account for 30% of land area. They provide the yield of approx. 3.9 tons/ha. The rice of this season is infected/attacked mostly by rice blast, sheath blight, brown plant hoper, leaf folder, stem borer. The main reasons using more hybrids are the government subsidy (for seed), higher suitability for hollow fields thanks to stronger stem, higher yield, better eating quality of rice. People, using the varieties spare seeds for one more season. The commune authority cannot make the planning for seed production while the hybrids supplied through the market have very unstable quality => question of extension activities and mainly the commune authority’s commitment/enthusiasm.

The commonly used corn hybrids (VL 99, HN 145) are sown on 74 hectares of alluvial plain along the river bank which provide the yield of 5.4 tons/ha.

Seeds are supplied through extension services or through agents/outlets network of Seeds and Plants Center of Phu Tho province.

**Interview in Mai Tung commune, Ha Hoa district – Mr. Le Van Cau, Chairman of the People’s Committee**

The 400 households (2000 habitants) of the commune have 95.6 hectares. Though small areas, the people are cultivating with various combinations: 44ha with 3 rice production seasons, 24ha with winter-spring season and 01 fish farming season, 13ha alluvial plain for corn, 9.7ha land along the river bank for secondary cultures, 5.2ha with 01 summer rice season and 01 vegetables/corn, 5.3ha for forestry.

The most common variety is Khang-Dan 18 (account for more than 55%) which give the yield of 4.8tons/ha. The seeds are supplied through the extension services or the agro-material supply outlets of the district. People have not the habit to spare seeds. Previously, the commune had a programme for variety seed production but the programme had finally failed due to the lack of effective trading mechanism.

The hybrids (Thien Nguyen, Nhi Uu, Q-Uu, imported from China) have very unstable quality, sold at very high price (though subsidised from the state budget) and supplied very late despite people have to pay early.
Few corn hybrids are used: 888, 999, VL (Vietnamese).

**YEN BAI Province**  
*Mr. Lai The Hung, Manager of Crop Section, DARD of Yen Bai province*

The varieties have shorter term of growing which is very suitable for summer season (from June – September). The seed is much cheaper and the commercial paddy can be sold at higher price is another advantage of varieties. The varieties available are: Chiem Huong, HT 1 (the yield is about 4 – 5 tons/ha).

The hybrids available in the province are: Nhi Uu 838/ 63; Thuc Hung 6, Nhien Huong, N-Uu 69 (Chinese imported) HYT100, TH3.3, VL20 (Vietnamese, produced at the Center’s production farm). The yield is around 5.5 – 6 ton/ha. The hybrids are used mainly for Winter-Spring season (January – May) because there are government subsidies and grant for hybrid seeds.

The Seed Center of Yen Bai province can play an important role in this project: to be foundation seed producer, to be technical provider for production and storage to the farmers, to assist in application of certificate and marketing the seed products.

*Mr. Nguyen Dai Hai, Director, Seed and Seedling Center of Yen Bai province*

The key function of the Center is to “refine” the seed product.

**Dai Phac Commune, Van Yen district**  
*Mr. Ngo Van Tinh, Chief of the Dai Phac Agriculture Cooperative and Chief of Seed Production Group*

Rice: 129ha water rice. For the winter-spring season, the hybrids account for 30% while the varieties account for 70%. The use of hybrids is due to their suitability for hollow areas, so the farmers have not other choice.

Hybrid: **Nhi Uu 838** (Chinese). Yield: 6.1 – 6.9 tons/ha. The input is of 20% more than the input for varieties. Commercial paddy is sold at VND 6,500/kg. The seed is purchased from the distribution network of the province’s Seed Center at VND 50,000/kg. The hybrid is more sensitive to brown plant hopper.

Variety: **Chiem Huong**, yield about 5 ton/ha, best eating quality, very good resistance to pest and diseases, especially resistant to brown plant hopper, but attacked by stem borer. The commercial paddy is sold at VND 7,500/kg; **T10**: yield is about 5.8 tons/ha. Usually being infected (sheath blight) which cause stem collapse. As preventive measure, the seedling should be transplanted at lower density, to increase the K fertilizer and preventive spray. The commercial paddy is sold at VND 7,300/kg. Seed is purchased at VND 10,000/kg. The seeds of varieties are mainly spared or exchanged amongst the farmers, so exists the severe degradation as a problem

Storage: the seeds are plucked by the machine, dried on the sun. However, the farmer can keep it in the jute bag or wooden trunk for maximum 8 months. Afterward the seed can easily be attacked by the woodworm. There is the need of assistance from FAO project?

Current seed production programmes:
- Revolving credit programme with NOMAFSI (FAO)
- SRI (FAO): deployed by the Sub-Department of Plant Protection. This programme recommends seedling transplanting at low density (to save: water, seeds, agro-chemicals and to maintain the yield). This technique can be applied for any variety.
- The request proposed for potential/new variety: high yield (at least equal to the hybrid), good eating quality as much as of Chiem Huong (the variety BT 13 cannot meet this quality). There is also plan for production of sticky rice. (current market price is of VND24K/kg)

Problems to be solved:
- To introduce the varieties which are pest/disease resistant
- To revigorate Chiem Huong variety which has been seriously degraded. (NOMAFSI is assisting the techniques, the investment is from the provincial DOST).
- There is the need of new packing, suitable for retail (of 1kg/bag) which is beyond the capacity of the group.
- There is a need of central control of post harvest processing: drying, blowing, and packing for ensuring the quality/purity of the seed. This problem is more serious in the summer season due to heavy rain.

Training needs:
- Technology for varieties seed production and production of commercial grain
- Post harvest processing: actually, the group members are using only 01 plucking machine; the drying facility is very limited. This can be the reason for still low quality of the seed produced.

Maize
- Winter corn production (150ha in total whereas 100ha are on the rice field, 50ha are on alluvial ground). The corn, cultivated on the alluvial ground, can be produced in 3 seasons (spring-summer, summer-autumn which lasts from June – September, and winter corn from September – December). The corn is mainly used for feedstuff for livestock.

Basically, the Seed production can accommodate the seed demand of the whole commune. What we need are:
- Capital.
- Suitable equipment for post harvest processing (moisture meter, drying equipment). In order to ensure the quality and to timely meet the demand, it is necessary to construct a storage facility with capacity of 20 tons.
- Marketing (this in turns requires the support, promotion and propaganda from the commune and district authorities)

*Md. Hoang Thi Nguyet, Hamlet 3, Dai Phat commune, Van Yen district*
The lady grows 5 saos (1 sao = 360m2) of Chiem Huong variety and 1 sao of hybrid Nhi Uu 838 (3-lines crossed).

Cultivating process (Winter-spring season):
- Before sowing seed treatment: submerging in the warm water 24hrs (for winter, water change every 8hrs) or 20hrs (for summer season). Seed sowing on 9 January (for winter-spring season). Seedling transplanting 20 days later
- Upon the land bed preparation: 400kg/sao of organic fertilizer and 15kg of NPK. Transplanting at density/distance 32cmx32cm.
- 12 days after transplanting: urea – 3kg/sao
- 30 days after transplanting/ upon flowering: urea 3kg/sao + Kali 4kg/sao.
- 42 days after transplanting: Kali 3kg/sao for better seeds quality
Interview in Lam Giang commune, Van Yen district.

Mr. Vu Manh Hai, Chairman of People’s Committee of the commune

The commune has 145 hectares of rice cultivation. The hybrids account for 70% (Nhi Uu 838 or 63; average yield is approx. 6.4 tons/ha), the varieties account for 30% (Chiem Huong, HT1; average yield is between 5 – 5.6 tons/ha). As this commune is qualified for the “poor” (within the programme 135, the farmers have to pay only VND 20 – 25K/kg of hybrid seed (subsidy ranges from VND 10 – 20K/kg) or receive the “granted” seed from the government. The varieties seeds are purchased at VND 10 – 15K/kg. The seed of Chiem Huong can be spared for other 1 – 2 seasons, but the people do not spare seeds. Harvested paddy is dry in the sun and kept in jute bags at homes. Just few families have extra paddy for sales, other just keep for their own consumption.

Corn cultivating area of 200 ha (50 ha suitable for 2 seasons: April – July and August – November and 150 ha of slope terrain suitable only for April – July season). Hybrids used are: C919, Bioseed 96; 98 and NK 4300, sold at VND 65K/kg. The yield is of 2.8 – 3.0 tons/ha. Commercial grain is sold at VND 4.5 – 5.0 million/ton.

Soybean, cultivated on slope terrain of 250 ha. Varieties used are DT 84, DH4 (new) with higher yield (1.6 ton/ha) but commercial bean is sold at VND 10K/kg and the local variety (name unidentified) with lower yield (1.2 tons/ha), commercial bean is sold at VND 17K/kg thanks to better quality.

Cassava (tapioca) is cultivated on 400 ha of slope terrain. Varieties used are: KM94 and local one. The yield is 25 – 30 tons/ha. The fresh tapioca is sold at approx. VND 1.35 mns/ton; the dried chips are sold at VND 3.2mns/ton. Since the commune has about 7,000 ha of slope terrain, the people tend to expand the tapioca cultivating area (due to last year’s good market price and least investment for cultivating cost) and this expose the commune to the risk of soil degradation and the bare terrain will lead to other natural disaster risks (land slide, flash flood).

There are two distinguished seasons: rainy (from April – September) and dry (from October – March) where the rainy season comes with the risk of local whirlwind, landslides, flash flood while the dry season comes with severe drought

Mr. Ly Van Thanh, Dao ethnic, ward 10, Lam Giang commune

Mr. Thanh cultivates 3 saos (1,080m2) of rice, using hybrids Nhi Uu 63 (Chinese) and gets the yield of 0.15 ton/sao (or 4.16 tons/ha). The seed is bought for VND 55K/kg. He uses the fertilizers at very little amount: NPK (113kg/ha), K (2.77kgs/ha) and Urea (2.77kgs/ha). The reason for not using the variety (Chiem Huong) is the negative affect of the hot wind (in March or April) during the flowering period which causes the yield loss. **Conclusion: Mr. Thanh has some problem with the rice cultivating technology**

He also cultivates 3 hectares of cassava and uses more intensively the NPK (200 – 400kgs/ha) where he can harvest 20 – 25 tons and sells the chips at VND 3.15 mns/ton.

Ms. Nguyen Thi Vine, ward 6, Lam Giang commune

She cultivates 4 saos (1,440m2) of Bac Thom and Thien Huong varieties which have good yield (6.38 tons/ha or 0.23 ton/sao), good eating quality, high market price and seeds can be spared for another season. There are two ways of using the fertilizers:

1st option: upon the soil bed preparation (25kgs of NPK plus organic fertilizer per 1 sao), 2nd additional, 20 days after transplanting when weeding (Urea 5kgs/sao + NPK 7kgs/sao),
additional, when flowering (Urea 3 kgs + Kali 4kgs/sao). (NPK: VND 3,200/kg, Urea: VND 8,000/kg, Kali: VND 10,000/kg)

2nd option: upon the soil bed preparation (organics 200 – 300kgs/sao + P 10kgs/sao), then spot application of compound fertilizer (N&K) 2 days after transplanting at the dose of 8kgs/sao (VND 13,500/ks) (P: VND 3,300/kg).

The most popular pests are: leaf folder, stem borer, case worm. For seed spare, she has to select and separate the best, harvest separately, dry and keep in bag for another 1 – 2 seasons.


**Interview in Yen Binh district. Mr. Nguyen Hong Huy, V. Director, Agriculture Section of the district**

The district has 2000 hectares of rice. The hybrids Nhi Uu 838, Nhi Uu 63 (Chinese) and Dong Cuong, TH3-3 account for 75% and provide the average yield of 5.0 tons/ha. The varieties HT1, Chiem Huong, Khang Dan 18 account for 25% and provide average yield of 4.8 tons/ha.

District authority has plan to increase the area of high quality varieties to 40% (whereas Chiem Huong to account up to 25%). The commercial paddy of Chiem Huong is sold VND 2mn/ton higher than the one from hybrid.

Training needs: Propaganda skill (why do we need to produce seed? Marketing skill). Technical training

**Interview in Yen Binh commune, Yen Binh district, Mr. Nguyen Hoai Nam, 0915512900, Chairman of the PC of commune**

The rice cultivating area of the commune is of approx. 109.2ha. People do two production seasons. The hybrids Nhi Uu 838 (Chinese) VL 20 (Vietnamese) account for 80%, seed is sold at VND 40K/kg from the provincial Seed Center and provide the yield of 5.5tons/ha. The varieties HT1, Khang Dan 18, Chiem Huong and glutinous rice account for 20%, seed is sold at VND 18 – 20K/kg from the Seed Center (people can also spare seed for another 2 – 3 seasons) and provide the yield of 5 tons/ha. At selling price of VND 8.5mns/ton for hybrid cereals and VND 9.5mns/ton for varieties cereals (thanks to higher quality), the total revenue/hectare from hybrids (VND 46.75mns) is lower than from varieties (VND 47.5mns). The commune authority has as plan to encourage people to increase the varieties cultivating up to 70 hectares (65% out of total rice cultivating area). The storage system does not exist. The flashflood and inundation affect 33 hectares of rice.

Ms. Huong Thi Sy, Cao Lan ethnic, Linh Mon hamlet, Yen Binh commune

Cultivates 4 saos, using the hybrid Nhi Uu 838 due to her inundated parcels. She uses fertilizers: NPK (25kg/sao or 695kg/ha) Urea (5kgs/sao or 139kg/ha) K (0.7kg/sao or 25kg/ha). Due to excessive utilisation of N, the rice is attacked by brown plant hopper (in the Winter – Spring season) and case worm (Summer – Autumn season).

Ms. Ma Thi Dao and Ms. Le Thi Hien, Linh Mon hamlet, Yen Binh commune

Seeds (Hybrid Nhi Uu 838, variety HT1) are sourced from the province’s Seed Center for cultivating on 4 saos of land. Fertilizers: organic (as much as available), NPK (20kg/sao), Urea (5kgs/sao) and K (5kgs/sao). HT1 is bought for VND 16K/kg, provides yield of 0.18 – 0.2 tons/sao or 5 – 5.5 tons/ha. However, all the rice grown in Summer season are attacked by:
Severe bacterial blight, sheath blight, case worm, stem borer, brown plant hopper. Seed problem: unstable quality, ready to use the new varieties which are resistant to inundation and pest/diseases and with good quality. (Suggested to use BT 13 from NOMAFSI. The extension activities should be deployed in the area)

Interview in Bach Ha commune, Yen Binh district. Mr. Nguyen Van Lap, Chairman of PC of the commune

Rice. 124 ha out of 154 ha can be used for 2 rice production seasons while the 30ha cannot due to the drought. The varieties (Chiem Huong, Khang Dan 18, HT1) account for 70% of the rice cultivating areas, provide the yield of 5.5 tons/ha. The Khang Dan 18 is well resistant to diseases while Chiem Huong is lesser, compared to the hybrids. The popular hybrid Nhi Uu 838 is sensitive to the diseases (blast blight, sheath blight) and brown plant hopper, provides no difference in the yield (5.5 tons/ha). The commercial cerealeal of Chiem Huong is sold at VND 8 mns/ton while this of hybrid is sold at VND 6 mns/ton and only for the feedstuff purpose. People buy seeds from the district distributor and these of varieties can be spared for 3 – 4 seasons.

Corn. Winter corn hybrids (999, 919, NK66) are cultivated on the rice field (60ha) which has the yield of 9.7 – 11.1 tons/ha. NK66 is sensitive to sheath blight. Every year, there are about 4 training courses instructed by the extension center of the district.

Cassava. 250ha of hilly terrain are cultivated with tapioca which have the yield of 20 – 22 tons/ha. Tapioca can be sold at price of VND 10 mns/ha.

20ha of the commune are affected by landslides and flashflood.

Mr. Dang Kim Quang, Dao ethnic, Bach Ha commune, Yen Binh district.

He has 3 saos (1,080m2) suitable for 2 seasons and 2 saos (720m2) suitable for only 1 season. The 2-lines crossed hybrid is used for inundated field thanks to strong stem (seed is sold at VND 50K/kg) and provides the yield of 4.7 tons/ha (0.17 tons/sao). The Khang Dan 18 variety is used for better field and to be replaced after 4 seasons and provides yield of 0.15 tons/sao (4.16 tons/ha).

Fertilizers are used at limited amount: NPK (18kgs/sao) 2 days after transplanting and Urea (3kg/sao) 15 days later. In the flowering period: additional of 2kg/sao of NPK and 1kg/sao of Urea. Mr. Quang has recognized that the hybrid is more sensitive to pest and diseases.

Ms. Dang thi Quy, Dao ethnic, Bach Ha commune, Yen Binh district.

She cultivates 2 saos of variety Khang Dan 18 and 1 sao of hybrid Nhi Uu 838. Organic fertilizer is not applied. NPK: 25kg/sao upon the transplanting. 3.5kg/sao of Urea and 1kg/sao of Kali are used as additional 15 – 18 days after transplanting. The seedlings are produced in the small yard or in tray. The variety provides about 5 tons/ha and the hybrid provides slightly higher (5.5 tons/ha). On time application of the fertilizer is her technical suggestion.

LAO CAI province

Mr. Pham Dinh Que, V. Director of DARD of Lao Cai; Mr. Duong Duc Huy, Director of Lao Cai Center of Agriculture & Forestry Seed variety
ao Cai produces approx. 8,700 hectares of winter – spring rice (from Jan – June: 84% with hybrids and 16% with varieties) and 18,237 ha of summer – autumn rice (July – October: 75% with hybrids and 25% with varieties).

The province’s policy:
- To increase by 2,572ha (for winter – spring season with 20% of varieties) and by 2,005ha (for summer – autumn season with 30% of varieties).
- To use short – term hybrids and varieties.
- The hybrids popularly used are: Nhi Uu 838 (chinese), LC 25 and LC 212 (the Seed Center’s own products), VL 20, TH 3-3.
- The Varieties used are: Huong Thom, Seng Cu (indigenous), Bac Thom 7. The province prefer using the short – term varieties of high eating quality.

About the Seed Center:
- Training need: advanced techniques for foundation seed production.
- Current post harvest drying:

**Notes about the demonstrations as per the supervision trip in March 2010**
Even though the Seed Centers of three provinces are willing to take part in the process, they still emphasize the needs of enhancement the farmers’ capacity in terms of:
- cultivating techniques
- especially in the post harvest processing techniques applied

in order to ensure the quality of seed produced. The Seed production group, in their turn, need to strengthen their marketing capacity and negotiating power toward the Seed Centre.

For the initial stage of cooperation, in order to ensure the quality of the seeds, the Seed Center agree to buy the freshly harvest paddy directly from the field for further drying and processing in their processing entities, rather than leaving the farmers to handle this stage which expose the product to the risk of low quality. Other tactic to avoid the mix-up of other seed such as 1-week earlier harvest has been recommended. The farmers also stay happy with these due to the fact of still lacking necessary equipments (plucking machine, drying yard). Also, through the survey, it is obvious that the individual capacity of the local extension staff must be re-enforced.

1. **Seed Production group in Minh Hac commune, Ha Hoa district**
The group includes 17 households, using basic seed of Khang Dan 18 and BT13. The BT13 (introduction to this commune targets at overcoming the drought in the Spring season (120 – 125 cultivating days) and to avoid flood in Summer – autumn season (95 – 105 cultivating days). The variety is considered with good yield and better eating quality than the old Khang Dan 18.

2. **Seed Production group in Chan Mong commune, Doan Hung district**
The group includes 2 households, using basic seed of SH14 (for high yield) and T10 (for high quality) introduced for the first time by NOMAFSI in this area. This variety is acclaimed as resistant to pest and diseases and sustainable to the drought. The purpose is similar to the demo in Minh Hac commune of Ha Hoa district.

3. **Seed Production group in Yen Binh commune, Yen Binh district**
The seed production group includes 18 households, using foundation seed of TL6 variety. The goal is to establish the seed buffer for Yen Binh district which usually suffers the flash flood and inundation. In this commune, the storage system practically does not exist.

4. Seed Production group in Dai Phac commune, Van Yen district
The group includes 56 households, cultivating on 7 hectares, using basic seed of Chiem Huong, T10. The issues to be solved in this demo are: (i) revigorate the degenerated Chiem Huong variety which has very good market values and introducing new pest and disease resistant varieties; (ii) strengthening the technical capacity of Seed Production group in seed production with emphasis on post harvest processing; (iii) establish the collaboration between the seed production group and the Seed Center in terms of financing (for further production) and marketing (for produced seeds) and (iv) strengthening the political/propaganda support from the local authority (People’s Committee).

5. Demo for slope technology in Lam Giang commune, Van Yen district
The size decided to be 1 hectare. Location and number of households will be selected later by NOMAFSI and commune authority. Here, the technical target is the application of slope technology/sustainable cassava production against land degradation, landslide. According to NOMAFSI, the demo can start in April or May.

6. Seed Production group in Muong Vi commune, Bat Xat district
The emphasis on indigenous (high eating quality and marketing possibility) variety named Seng Cu. The demo targets on issues: (i) revigorate the variety which has been degenerated due to the seed exchange as common practice of the farmers in the commune (ii) strengthening the finance/marketing possibility for the seed producers with the aim to maximize the average income/margin on limited land asset (iii) create the seed hub for indigenous variety with big market potential for Bat Xat district which suffers flash flood, landslide and severe drought in high areas where people can cultivate only one rice season, i.e., they rely mainly to the rainfall.

It has been late to start the demo for this season, so it is finally agreed with the Commune people’s Committee to start next season (from end of May – June).

7. Seed Production group in Son Hai commune, Bao Thang district
The Seed production group includes 24 households, but the demo with the size of 1 hectare gets involved only 17 households, using two high quality varieties HT1. The issues to be solved in this demo are: overcoming the variety degeneracy (due to the seed exchange practice amongst the farmers) and seed supply for the district and commercial grain production using varieties of high quality.
Annex II. Why Do We Need Demonstration Sites?

7 locations in 6 district (2 districts/province) have been selected and proposed for varieties demonstration with various purposes

- 2 in Phu Tho province which are undertaking the demonstration of variety’s drought and pest/disease resistance. The varieties used are: BT13, Khang Dan 18, SH14 (for Winter-Spring season) and BT13, T10 (Summer-Autumn season). Those are of short cultivating term, wide adaptation with high yield and high market value. The purposes are: (i) to refresh the seed spare practice for enhancing farmers’ resilient capacity upon flood/inundation (ii) The success will have definitely strong impact to the provincial authority and the provincial Seed Center who have been so far too ambitious to go for the hybrids usage.

- 2 in Yen Bai province which are under implementation for demonstration of variety’s drought and pest/disease resistance. The varieties Chiem Huong (high quality and market value, wide adaptation), TL6 (new cold tolerant variety, short cultivating term with high yield and high grain quality) are used for both Winter-Spring and Summer-Autumn seasons. The purposes are: (i) to refresh the practice of seed spare of the farmers as a way to enhance their resilient capacity upon flood/inundation/landslides as adverse consequences of climate change (ii) As pilot goal, to establish and strengthen multi-aspect (technical, financial, trading and marketing) collaboration between the seed production group and the provincial Seed Center.

- 1 extra demonstration in Yen Bai province has been proposed for slope technology which is technical emerging for coping with agricultural and sustainable cassava production on steep terrain areas of mountainous provinces of Yen Bai and Lao Cai. Though this is very critical issue, considered as one of main reasons of soil degradation/erosion and landslides, due to the lack of budget, this demo is suspended probably for next year production.

- 2 demonstrations in Lao Cai province (1 for seed production group set – up as the seed buffer for emergencies, using HT1 variety which is of high yield and high grain quality with wide adaptation and 1 for seed production for outstanding quality rice of indigenous Seng Cu variety which is one of the most important varieties in for poverty relief in highland areas but has been degenerated in the last couple of years due to house-to-house seed exchange practice). Similarly to the cases of Yen Bai provinces, these demos, besides the purpose of servicing as seed buffers, have also as pilot goal to establish and strengthen multi-aspect (technical, financial, trading and marketing) collaboration between the seed production group and the provincial Seed Center.
Annex III. Why Dai Phac need Grain Sorting Machine and Grain Moisture Tester?

Dai Phac is good enough in field production. However, they still have problem with post-harvest processing which expose their seed product to quality risk: impurity, inappropriate moisture, short storage lifetime. Discussions with management of all the Seed Centers in 3 provinces have remarked their serious concern about the seed quality due to the lack of appropriate facilities for post-harvest processing. As counter-measure, they have to negotiate with the farmers to by “fresh” paddy from the field, transport back to their processing entities and process by themselves. This solution might help the Seed Center to control (for short term) the quality, but expose the farmers to long run disadvantages: low quality of the local seed buffer, inferior power in dealing with the trader (Seed Center), lower income.

With the same amount of budget for one demo site, we recommend to invest in the grain sorting machine (or screening m/c, if you want to call it) with capacity enough for processing the seed from Dai Phac group. This will enable the group to achieve:
- Standard seed with higher marketability
- Improvement of the group marketing capacity thanks to better product as a start-up for their product’s reputation and a commencement of brand building
- Increasing the income for seed producers to pay off their extra cost incurred for seed production.

For the Seed Center, this will help them:
- To reduce processing and transportation cost => improve their margin.
- To be sure about the adequate quality of the seed.

- This will facilitate a “win-win” relation between the farmers group and the trader (Seed Center)
- Dai Phac will be a standardized model of seed production group for which, capacities for field production, processing and marketing are well developed.
- This will be also a proven suggestion for Seed Center of how to invest (besides agri-materials) further for farmers, should they link with other seed producers (somewhere else) for a sustainable local seed production/supply network.
- FAO project deals with not only technical capacity building, but also with other types of capacities: marketing, system strengthening, etc