

Ministry of Foreign Affairs of Denmark

## Post Harvest Programme for the North

Agricultural Sector Programme Support, Vietnam

### Impact and Lessons Learned Study

*Final Report*

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**NIRAS A/S**  
F.R.I., FIDIC

Sortemosevej 2  
DK-3450 Alleroed  
Denmark

Telephone +45 4810 4200  
Fax +45 4810 4300  
E-mail niras@niras.dk

## **ACRONYMS AND ABBREVIATIONS**

ARD SPS	Agriculture and Rural Development – Sector Programme Support
ASPS	Agricultural Sector Support Programme
CMU	Component Management Unit
Danida	Danish International Development Agency
DARD	Department of Agriculture and Rural Development
DKK	Danish Krone
DST	Department of Science and Technology
Ha	Hectare
IPM	Integrated Pest Management
KAP	Knowledge, Attitudes and Practices
Kg	Kilogram
MARD	Ministry of Agriculture and Rural Development
MC	Moisture Content
PH	Post Harvest
PHHC	Post-Harvest Handling Component
PHPN	Post-Harvest Programme for the North
PTO	Provincial Technical Officer
TEO	(Provincial) Training and Extension Officer
US\$	United States Dollar
VIAEP	Vietnam Institute of Agricultural engineering and Post-Harvest Technology
VND	Vietnam Dong

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## SUMMARY

The Post-Harvest Programme for the North (PHPN) is a sub-component of the Post-Harvest Handling Component (PHHC) of the Danida-funded Agricultural Sector Support Programme (ASPS). The PHHC is within the mandate of the Department of Science and Technology (DST) of the Ministry of Agriculture and Rural Development, Vietnam (MARD). The PHHC Management Unit is based in Hanoi at the DST's Vietnam Institute of Agricultural Engineering and Post-Harvest Technology (VIAEP).

The PHPN commenced in December 2003 and has a completion date of 30 June 2007. In 2006, the Government took over a part of the Programme's management and financing under a plan aimed at ensuring that the Programme's activities are sustained. From 1 January 2007, the Government has been responsible for financing and managing all activities established by the Programme.

During the first two years of implementation, the PHPN covered two provinces, Son La and Ha Giang, four districts in each of these provinces, and five communes in each of the districts, giving a total coverage of 40 communes. Coverage was doubled during the 2006 sustainability phase, through an increase in the communes covered in each district from five to ten.

As a sub-component of the ASPS, the PHPN's main target groups are women, ethnic minorities and the poor. The Programme's main aim is to improve post-harvest activities, especially activities that involve significant losses. It has three inter-related activities: (a) formal training of extension staff, farmers and service providers; (b) demonstration of improved post-harvest technologies located at the premises of farmers, traders and other service providers; and (c) mass media campaigns.

The Consultant's broad assessment of the Programme is that it has achieved the important functions of establishing post-harvest activities within the extension programmes of Son La and Ha Giang Provinces and of demonstrating that improved post-harvest technologies which are easily operable by small-scale farmers or by traders have great potential for reducing post-harvest losses and for improving the lives of poor rural households. The Programme has also directly benefited a subset of farmers within the 80 communes by training them in means of reducing post-harvest losses. The Programme has been highly successful in the targeting of ethnic minorities and also to a large extent in targeting women.

Notwithstanding these successes, we consider that the Programme could have achieved more if it had been better designed and implemented more creatively. The Programme's logical framework is confused and excludes in its intervention logic the key step of adoption of the practices demonstrated. The scheduling of activities was weak, with training taking place concurrently with the preparation of training manuals and the establishment of demonstration sites. The field-testing and demonstration of technological packages were combined, rather than testing preceding demonstration. The importance of a clear definition of losses and of the need to examine the many dimensions of losses was not appreciated during design, with

the result that the nature and extent of losses in the two Programme provinces remains undocumented and largely unknown. Monitoring and evaluation of Programme activities has been good, but there has been no monitoring of the impact of the Programme on the adoption by farmers of improved practices or of spontaneous investment by farmers in the technologies demonstrated.

Of most concern, is that the affordability by the target groups of the technological packages demonstrated was apparently not considered during design. The reality is that poor rural households in the targeted provinces are very poor indeed. They consequently have limited or no capacity to acquire the technology demonstrated unless it is donated to them free of charge or at a highly subsidised price.

One outcome of the Programme is that the demonstrations of improved technologies have led to the Government, IFAD and SIDA donating maize shellers, small-scale maize dryers and corrugated storage bins to poor farm households. Other possibly than for hand-held shellers, these donations, coupled with the equipment provided for the PHPN demonstrations, account for the bulk of the improved post-harvest equipment currently being utilised in the two Programme provinces. Donations of equipment are a legitimate means of helping poor households. However, if this is indeed the only means by which the target population can acquire the demonstrated technology, the Programme should have been designed accordingly.

The PHPN Draft Final and Implementation Reports emphasise that in Son La Province maize has become a cash crop and that consequently the key post-harvest need is to improve the efficiency of off-farm flatbed drying. However, during both the first two years of implementation and the sustainability phase, most effort in this province went into the promotion of improved small-scale, on-farm drying and storage technologies. Not surprisingly, there has been no significant adoption by farm households of these technologies. There has however been a large expansion of flatbed drying. This would seem partly due to the prior existence of flatbed driers in the Province but is almost certainly partly attributable to the Programme, especially its training and mass media campaigns.

In general, training has been the most successful Programme activity, with participants reporting that they appreciated the training and that it has improved their post-harvest practices. The video training presentations prepared by the programme and viewed extensively at village level were of good quality and proved to be an especially effective and efficient means of supporting the more formal training. The television campaigns were probably less effective in terms of training, since most farmers cannot pick up signals from the provincial stations that were mostly used. However, the campaigns both served to sensitise a wide audience to the activities of the PHPN itself and to introduce means of addressing post-harvest constraints to farmers in other Northern provinces.

Finally, we should emphasise that, despite our criticisms of aspects of the PHPN, the Programme has done much to get post-harvest extension on to the policy agenda and has demonstrated that widespread adoption of appropriate improved technologies has the potential to markedly benefit small-scale farm households. These achievements have been attained on a budget of less than 2% of the total ASPS budget and in a period of only three

years. The Programme has also provided many lessons from which future post-harvest programmes should be able to benefit. Recommendations derived from these lessons appear in Section 7 of this report.

## 1. INTRODUCTION

### 1.1 Background

Danida has been providing project assistance to Vietnam since 1994. A broad Programme of Agricultural Sector Programme Support (ASPS) was initiated in 2000, with an initial duration of five years and a budgeted cost of DKK 435.4 million (equivalent to USD 62.2 million). The ASPS comprises seven components covering seed, integrated pest management (IPM), post harvest handling, small livestock, credit, strengthening of the Vietnam Farmers' Union, and strengthening of the Ministry of Agriculture and Rural Development.

A next generation ASPS is under preparation: the Agricultural and Rural Development Sector Programme Support (ARD SPS). This has a Central and Provincial Component. The latter will cover the provinces of Dien Bien, Lao Cai and Lai Chau Provinces in Northern Vietnam and Dak Lak and Dak Nong Provinces in the Central Highlands.

The Post Harvest Handling Programme for the North (PHPN) is one of seven sub-components of the ASPS Post-Harvest Handling Component (PHHC). The main aim of the Programme is to reduce the large amounts of harvested grain that are lost during storage as a result of the development of mould and damage by rodents and insects. The Programme was prepared by a team of national and international consultants in 2002-03.<sup>1</sup> It commenced in December 2003 and ran for a two-year period to December 2005. From the start of 2006, the Programme was extended for a further one year and doubled in spatial coverage, with the two DARDs taking over a part of the financing responsibility from Danida.

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<sup>1</sup> It would appear that the definitive PHPN-specific documents are *Post Harvest Programme for the North: Final Draft Report* and *Final Implementation Report*, Agricultural Sector Support Programme Post Harvest Handling Component, Final Draft Report, MARD, Government of Vietnam/Danida, December 2003.

## 1.2 The Impact Assessment

### 1.2.1 Objectives and coverage

The terms of reference (TOR) for this PHPN Impact Assessment are presented in Annex A. These provide for a broad assessment of the impact of the Programme as a whole and also specify a set of more detailed assessments of barriers to the adoption of post-harvest technologies, and of the quality and impact of selected Programme activities and outputs. In addition, the TOR provide for an assessment of key achievements, successes, constraints and lessons learned, with the ultimate aim of providing recommendations to Government and other stakeholders for further support for post-harvest activities in upland maize growing areas and for approaches to be adopted to post-harvest activities in the provincial component of ARD SPS.

It is important to note that this Impact Assessment is not a full evaluation of the Programme. Management and other aspects of implementation are only discussed to the extent that they have affected impact.

### 1.2.2 Methodology

The PHPN covers only selected communes in selected districts in two Provinces. It would appear that the original intention was for the PHPN to act principally as a pilot that would seek to determine the level and causes of qualitative and quantitative post-harvest losses at different stages of the post-harvest process, would formulate technically, financially and economically viable solutions, and would outline how the solutions would be implemented.<sup>2</sup> To the extent that this remained the objective (see section 4.1, below), the impact of the programme needs to be assessed not only in terms of the impact that it has had on farmers and service providers that benefited directly from the Programme's training, pilot demonstrations and mass media campaigns but also in terms of the extent to which it will assist the design of further support for post-harvest activities in the North of Vietnam.

To meet the requirements in the TOR relating to lessons learned and recommendations, it is essential not only to estimate impacts but also to explain the reasons why the programme has been more successful in having beneficial impacts in some areas than in others. The effectiveness of a Programme in meeting its objectives depends on the quality of its design and the efficiency and effectiveness of implementation. Both must be investigated to allow lessons to be drawn and sound recommendations to be made.

Post-harvest activities are an integral part of the value chains that run from each farmer's field through to final use of the commodity either on-farm, within the locality or at some distant point. As the commodity moves down these chains, its physical characteristics and value are changed through processing, grading and packaging, and through

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<sup>2</sup> See: PHPN, *Draft Final Report*, December 2002, para. 1.1 and 4.2.

unintentional losses in value and quantity. Its value is also changed through transport and storage, which alter the points in time and space at which it is available for use. All the activities from the point of harvest to the point of final consumption can be undertaken using different combinations of technologies and different scales of each technology. For example, if a small-scale farm produces maize for home use, the main post-harvest activities are shelling, drying, storage and processing into an edible commodity. These can all be done on farm, all be done off farm, or there can be a mixture of off and on-farm activities. The appropriate type and scale of technology at each point in the web of post-harvest supply chains (including at the producing farm) depends on a large number of factors, including the use to be made of the commodity,<sup>3</sup> agro-climatic conditions, the crop combinations produced by individual farms, local food consumption patterns, farm sizes, farm-household sizes, farm density/remoteness, the local terrain and the quality of access roads, the existence and reliability of electricity supply, and food consumption preferences and other cultural factors. Given the complex set of determinants of optimal technologies, the Assessment Team first sought to rapidly obtain an understanding of the agricultural, geo-physical, climatic, cultural and economic structures in the upland areas of Son La and Ha Giang Provinces, through observation, the collection of data, and the questioning of stakeholders.

Analysis of the Programme itself was hampered by the lack of systematic monitoring during implementation of the impact of Programme activities against baseline data. Consequently, the Team sought to assess the Programme's impact principally through questioning stakeholders, using existing data on programme *implementation*, and examining the results of knowledge, attitude and practices (KAP) surveys that have been undertaken during implementation. Due to the seasonality of production and use, the team was unable to observe any of the promoted practices in operation, other than for improved small-scale storage bins, since no maize was being harvested during the mission, and, in the case of Son La Province, there was very little maize left within the province.<sup>4</sup> This made it difficult to come to firm conclusions on the impact that the training and mass media campaigns have had on the actual behaviour of farmers, but the Team considers that it has gathered sufficient evidence to make a reasonably accurate assessment of the broad impacts of the Programme and the lessons that can be drawn.

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<sup>3</sup> In the case of maize in the two PHPN provinces, maize is used for home consumption by the farm household's members, is used as feed for the farm's livestock, and is sold to raise cash.

<sup>4</sup> We were, however, able to observe traditional on-farm storage of maize cobs.

### **1.2.3 The Assessment Mission**

The mission team<sup>5</sup> assembled in Hanoi on Monday 26 February 2007 and concluded its work in Vietnam with a workshop and debriefings on 16 March 2007. The team undertook fieldwork in both Son La and Ha Giang Provinces. Working in two groups, they met with government staff from the provincial to the village level, held discussions with farmers and service providers, and visited pilot demonstrations established under the Programme. In all, the team visited a total of 17 communes in Thuan Chau and Yen Chau Districts of Son La and in Dong Van, Yen Minh and Bac Quang Districts of Ha Giang. The team also held meetings in Hanoi with the national PHPN Coordinator and the Danida ASPS Chief Technical Adviser and, on the last day of the mission, presented its draft findings to a stakeholders' workshop. A schedule of the Assessment Team's field visits and persons met is contained in Annex B.

## **1.3 Report Structure**

Sections 2 and 3 of the report provide information on the PHPN and on conditions in the two Provinces in which it was implemented. Section 4 assesses the design of the Programme and the influence which this has had on its impact. Section 5 contains a more detailed assessment of the Programme's three main types of activity: training, pilot demonstrations and mass media presentations. The cross-cutting issues of targeting, market information and sustainability are covered in Section 6. Section 7 makes recommendations for future support for post-harvest activities in Northern Vietnam.

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<sup>5</sup> The Assessment Mission Team comprised four national consultants (Dr. Nguyen Ngoc De, Economist; Dr. Dao Thanh Van, Agronomist; Dr. Vu Ngoc Uyen, Economist; and Mr. Nguyen Xuan Thuy, Agro-economist) and two international consultants (Mr. Peter Moller-Christensen, Horticulturalist; and Dr. Mike Westlake, Economist/Team Leader).

## 2. KEY FEATURES OF THE PROGRAMME

### 2.1 Objectives

As an ‘output’ of the PHHC, which in turn is a component the ASPS, the PHPN is subject to a hierarchy of objectives, as follows:

Development Objective of the ASPS: *Reduced poverty of rural areas based on sustainable agricultural development.*

Development Objective of the PHHC (Immediate objective of the ASPS): *Sustainable growth in productivity and farm household income from quantitative and qualitative improvements in agricultural production and marketing, with special focus on the poor, women and ethnic minorities.*

Development/Overall Objective of the PHPN<sup>6</sup>: *Improved village level supply of post harvest services and improved management of individual households of their post harvest operations.*

Immediate Objective of the PHPN: *Reduced losses of maize during threshing, drying and storage operations at village and household levels.*

### 2.2 Period of Implementation

The Programme commenced in December 2003 and has a completion date of 30 June 2007. The original intention was for implementation to span a two-year period ending in December 2005 (hereafter, ‘the initial phase’.) In the event, following relatively slow progress with initial implementation, the Programme was extended in modified form to cover 2006 (hereafter, ‘the sustainability phase’), under separate ‘Sustainability Plans’ for Son La and Ha Giang, each signed by the DARD Vice Director for the province, the National Programme Coordinator, and the Senior Component Adviser. The Plans provided for the two DARDs to take over a part of the financing of PHPN activities and for these activities to be carried out in 40 additional communes. The Government assumed full responsibility for the continuation of PHPN activities from 1 January 2007,

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<sup>6</sup> Note that this differs from the immediate objectives of the PHHC, which are: (i) *Low cost access of farm households to low-cost threshing, drying and storage services;* and (ii) *Improved management by individual farm households of threshing, drying and storage operations.*

other than for minor logistical support that is being provided to the Component Management Unit (CMU) of the PHHC.

### 2.3 **Spatial and Crop Coverage**

Northern Vietnam has 31 provinces. The PHPN is a pilot programme covering the two provinces of Son La and Ha Giang. Son La is in Vietnam's North-West Region and has a population of approximately 1.0 million. Ha Giang is in North-East Region and has a population of some 700,000. Both provinces have 10 rural districts, of which The Programme covered four, giving eight Programme districts in total.<sup>7</sup> In each of the eight districts, five communes were selected, giving a total of 40 PHPN communes, 20 per province. This meant that the Programme covered a little over 10 percent of the total number of communes in Son La (189) and in Ha Giang Provinces (181), and 1.7% of the 2,389 communes in the North East and North West Regions. During the sustainability phase, a fifth district, Hoang Su Phi, was added to the Programme.

The Programme has principally focused on maize, other than in Bac Quang District, where rice is the predominant crop. Rice is also the main crop in Hoang Su Phi District. Soybean is of growing importance as a second season crop, especially in Ha Giang, and, together with rice, was to be given 'secondary emphasis' by the Programme.<sup>8</sup>

### 2.4 **Activities**

The PHPN is essentially an extension Programme aimed principally at improving the efficiency of post-harvest activities, especially those that involve significant losses. It has sought to do this through three inter-related activities: formal training of extension staff, farmers and service providers; demonstration of improved post-harvest technologies located at the premises of farmers, traders and other service providers; and mass media campaigns.

### 2.5 **Programme Management and Staffing**

The PHHC is within the mandate of the Department of Science and Technology (DST) of the Ministry of Agriculture and Rural Development. The Component Management Unit (CMU) is based in Hanoi at the DST's Vietnam Institute of Agricultural Engineering and Post-Harvest Technology (VIAEP). The CMU is headed by a National Component Coordinator, who was supported by an international Senior Adviser until mid 2006, and five support staff. In each province, the PHPN established a Provincial Office, located at DARD headquarters and staffed by a Provincial Technical Officer (PTO) and a Training and Extension Office (TEO), and a District Office in each of the eight PHPN districts, staffed by a District Technical Officer. The latter were absorbed into the mainstream DARD structure at the district level at the end of 2006. The PTO and TEO continued in

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<sup>7</sup> Population data are from the General Statistics Office of Vietnam ([www.gso.gov.vn](http://www.gso.gov.vn)).

<sup>8</sup> Final Implementation Report, P. 5.

their PHPN role during 2006, prior to being absorbed into the DARD structure at the end of the year.

### 3. **CONTEXT: THE STRUCTURE OF AGRICULTURAL PRODUCTION, PROCESSING AND MARKETING IN SON LA AND HA GIANG PROVINCES**

The structures of local agricultural economies are a critical determinant of the need for particular on-farm and off-farm post-harvest activities and of the technologies that are most appropriate for them. This section briefly highlights and contrasts features of the agricultural economies that characterise Son La and Ha Giang Provinces.

#### 3.1 **General Characteristics**

Both Son La and Ha Giang are upland provinces where the majority of the population live in rural areas and rely heavily on agriculture. In both provinces, over 40% of GDP is still generated by the renewable natural resources sector, principally by agriculture. Income per capita is very low in both provinces compared with that for Vietnam as a whole. In 2003, it was some US\$ 157 (VND 2.45 million) in Ha Giang and US\$ 190 (VND 2.97 million), well under half that in Vietnam as a whole. Furthermore, these figures mask marked differences within the provinces between districts and between households within districts. A large number of rural households currently have mean incomes per member below US\$ 100 per year, especially in the more remote mountainous areas of Ha Giang near the Chinese border, where most of the population live very hard lives and many households do little more than just survive.

Both provinces have a high proportion of ethnic minority groups. In Son La, members of the Thai ethnic group are in the majority, accounting for 55% of the population. In Ha Giang, the Hmong account for 31% of the population and the Tay 25%. Each ethnic group tends to be spatially concentrated, with the result that some districts and communes have high concentrations of a single 'minority' ethnic group. For example, 80% of the population of Dong Van District of Ha Giang Province are Hmong and in some of the district's communes virtually the entire population comprises this ethnic group.

**TABLE 1: ETHNIC GROUPS AS A PERCENTAGE OF TOTAL PROVINCIAL POPULATION**

SON LA		HA GIANG	
Ethnic Group	%	Ethnic Group	%
Thai	55.0	Hmong	31.0
Hmong	14.4	Tay	25.4
Muong	8.3	Dao	15.1
Dao	2.6	Nung	9.9
Other	2.4	Other	6.6
<u>Total minority groups</u>	<u>82.7</u>	<u>Total minority groups</u>	<u>88.0</u>
Kinh	17.3	Kinh	12.0
<u>Total</u>	<u>100</u>	<u>Total</u>	<u>100</u>

### 3.2 Crop Production

Table 2, overleaf, contains details of production of the main crops produced in Son La and Ha Giang Provinces. In Son La, maize is the predominant crop in terms of area planted and probably also in terms of farm-gate value.<sup>9</sup> In 2005, it was exceeded by cassava in terms of tonnage produced.<sup>10</sup> Maize is by far the most important crop in two of the four PHPN districts in Son La, Yen Chau and Moc Chau. In Mai Son, maize is also the main crop, but its output is exceeded in weight by the combined output of rice and cassava. In Thuan Chau, maize is predominant in terms of area planted but a substantially higher weight of cassava is produced. Since virtually all maize is exported from the district immediately after harvest and since the weight of rice output is only one third that of cassava, Thuan Chau's main post harvest problems relate to cassava.

The maize planted in Son La is now almost entirely hybrid. Maize is grown on the hillsides that rise above the areas of paddy. It was formerly cultivated mainly as a part of slash and burn cycles, but population pressure coupled with more permanent settlement has led to it being grown more intensively. There is currently little evidence of attempts to control erosion despite the fact that many maize fields are on precipitous slopes.

In Dong Van, agro-ecological conditions and the terrain are more variable than in Son La, ranging from cold, rocky and precipitous to relatively warm, flat and large areas of good quality irrigated lowland. The PHPN districts range from Dong Van located in the North and adjacent to China to Bac Quang in the South. The former has very little irrigated paddy land. Bac Quang is an important rice growing district and is the only one of the eight PHPN districts in which rice was designated as the Programme's primary crop. In

<sup>9</sup> There are no readily available data on farm-gate value.

<sup>10</sup> 2005 is the latest year for which crop production data are currently available.

Dong Van, virtually the entire arable area is planted to maize during the main season. Meo Vac and Yen Minh Districts also rely predominantly on maize although they both have greater areas of paddy, especially Yen Minh.

Compared with Son La, there has been a much lower uptake of hybrid maize in Ha Giang, where traditional varieties still account for the bulk of output. In Dong Van, the target is for only 30% of maize planted to be hybrid. This low proportion reflects a recognition of the greater inputs required and risks involved in growing hybrids, as well as their poorer storage characteristics and a local taste preference for traditional varieties. Small amounts of cassava are grown in Ha Giang, but unlike in much of Son La, it is of only minor importance.

Soya bean is being promoted by the Government as a second-season crop in upland areas, but total output is still relatively small in both provinces. Of the PNPH districts, soya bean is most important in Yen Minh, where the tonnage produced is about one-fifth that of maize.

### 3.3 **Crop Utilisation and Post-Harvest Activities**

The heavy government investment in rural access roads in both Son La and Ha Giang in recent years has made most villages accessible to motorised transport for most of the year. In Son La this, coupled with the introduction of hybrids, has resulted in maize becoming predominantly a cash crop, with only small amounts being retained on farm for animal feed.

A part of the cash earned is used to buy alternative foodstuffs, especially rice. There is a relatively sophisticated maize marketing system under which large-scale traders based in Son La and provincial towns provide credit to small-scale traders to acquire maize either directly from farmers' fields or in rural villages. Often the large traders provide shellers to the villages and move the grain out in 10-ton trucks especially equipped to cope with conditions in the upland areas. These traders dry the grain at their own facilities using flatbed dryers, usually sorting and drying to meet the specific requirements of orders from large scale milling companies. Farmers also deliver shelled maize to these traders' premises and a minority of farmers reportedly store for a month or two prior to selling in anticipation of obtaining higher prices. However, Vietnam is net maize importer, with the result that world prices are the main determinant of domestic prices. A consequence of this is that domestic maize prices cannot be guaranteed to rise on a seasonal basis. Storage is consequently risky. Most farmers and traders in Son La therefore do not hold maize speculatively and most maize is shipped rapidly out of the province to large feed millers. This means that there is only a modest requirement for maize drying facilities and storage at farms or in local rural villages. The main need is for shellers, which, as noted is partially fulfilled by large-scale traders.

**TABLE 2: CULTIVATION OF FOOD CROPS IN THE PHPN PROVINCES AND DISTRICTS, 2005**

	MAIZE	RICE	CASSAVA	SOYABEAN
<b>HA GIANG</b>				
<b>Cultivated area</b>	(Hectares)			
Bac Quang*	3,169.7	12,840.9	623.7	719.3
Dong Van	7,249.3	698.0	12.3	1,610.7
Meo Vac	7,050.0	1,321.5	115.0	2,137.0
Yen Minh	6,193.8	2,494.3	157.0	2,690.4
<b>PROVINCIAL TOTAL</b>	<b><u>44,024.1</u></b>	<b><u>36,683.6</u></b>	<b><u>2,570.1</u></b>	<b><u>15,711.6</u></b>
<b>Yield</b>	(Tons/ha)			
Bac Quang*	2.5	4.5	8.9	1.0
Dong Van	1.9	4.2	5.2	0.5
Meo Vac	2.1	3.7	6.6	0.7
Yen Minh	2.3	4.2	7.6	1.1
<b>PROVINCIAL TOTAL</b>	<b><u>2.1</u></b>	<b><u>4.2</u></b>	<b><u>7.7</u></b>	<b><u>0.9</u></b>
<b>Output</b>	(Tons)			
Bac Quang*	7,901	57,442	5,578	685
Dong Van	13,448	2,954	64	798
Meo Vac	15,058	4,936	759	1,453
Yen Minh	14,459	10,548	1,193	2,929
<b>PROVINCIAL TOTAL</b>	<b><u>92,615</u></b>	<b><u>154,810</u></b>	<b><u>19,797</u></b>	<b><u>14,694</u></b>
<b>SON LA</b>				
<b>Cultivated area</b>	(Hectares)			
Yen Chau	9,006	2,138	1,126	162
Thuan Chau	8,601	4,988	3,039	1,172
Mai Son	12,800	3,217	1,800	2,268
Moc Chau	11,439	4,695	1,078	582
<b>PROVINCE TOTAL</b>	<b><u>80,903</u></b>	<b><u>39,030</u></b>	<b><u>17,806</u></b>	<b><u>12,093</u></b>
<b>Yield</b>	(Tons/ha)			
Yen Chau	3.3	4.3	8.5	1.3
Thuan Chau	2.9	2.8	13.0	1.0
Mai Son	2.8	2.6	16.5	1.1
Moc Chau	3.2	3.1	10.0	1.2
<b>PROVINCE TOTAL</b>	<b><u>2.8</u></b>	<b><u>3.3</u></b>	<b><u>10.8</u></b>	<b><u>1.1</u></b>
<b>Output</b>	(Tons)			
Yen Chau	29,331	9,275	9,571	204
Thuan Chau	25,026	13,816	39,507	1,147
Mai Son	35,298	8,370	29,700	2,419
Moc Chau	36,649	14,725	10,780	721
<b>PROVINCE TOTAL</b>	<b><u>228,030</u></b>	<b><u>128,302</u></b>	<b><u>192,271</u></b>	<b><u>13,549</u></b>

\* Includes Quang Binh District, which separated from Bac Quang District in 2004.

In Ha Giang, maize is still a major food crop. It is the staple in some districts and it is eaten as a supplement to rice in others. The poorest of the PHPN districts, Dong Van, produces insufficient maize and other staples to meet the district's requirements.<sup>11</sup> Many farm households produce inadequate staple foodstuffs and rely for part of the year on external assistance and on small purchases funded from occasional earnings from labouring on public works programmes or in other farmers' fields. Maize is dried naturally in the open air, stored on the cob in the lofts of houses, and shelled as it is needed for household use and for animal feed. Since the climate is damp, much of the maize is inadequately dried and deteriorates to the point at which it is unfit for human consumption. It is then used to feed livestock, and large amounts of mouldy and otherwise damaged maize is distilled into alcohol, both for home consumption and sale. In all the main maize-reliant districts of Ha Giang, including the three such districts included in the Programme, there is clear potential for measures that reduce on-farm losses to move large numbers of households and the districts as a whole towards staple food self-sufficiency and to thereby raise effective household incomes and improve human health and welfare.

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<sup>11</sup> i.e. the total usage (own-produced and/or purchased) of better-off households plus the minimum subsistence requirements of the food poor.

## 4. PROGRAMME IMPACT: THE INFLUENCE OF PROGRAMME DESIGN

### 4.1 Lack of Clarity in Objectives

The PHPN has lacked a clear and unambiguous statement of its main purpose. As late as September 2003, the Government of Vietnam and Danida jointly recognised that there was a lack of firm knowledge about the level and reasons for post-harvest losses in the North and that, in this situation of uncertainty, it would not be fruitful to initiate the implementation of a large-scale field programme immediately.<sup>12</sup> Thus, it would be necessary first to have a period of strategy development guided by a “northern working group”. An amount of US\$ 200,000 was tentatively budgeted for this. In the event, the process of formulating a hard programme of support continued. This culminated in December 2003 in final documents that became the blueprint for the PHPN. Thus, the Programme was formulated and implemented in the absence of a strategy to support the improvement of post-harvest activities and without the well-researched programme of development which was thought to be needed.

As a consequence, the PHPN has been an uneasy mixture of attempting to directly benefit a small set of farm households and school children while also experimenting with ‘pilot demonstration units’ previously untried in the field. In some instances, this has resulted in technology packages being demonstrated in situations where, following the experimentation, some have proved to be unsuccessful or the technologies have proved to be well beyond the financial capacity of the target group to acquire them. We consider that it would have been preferable for the programme to have been explicitly a vehicle for *developing* a comprehensive programme for the improvement of post-harvest practices in the North. Such a programme would have:

- systematically piloted trials of the technical effectiveness and the financial and economic viability of available post-harvest technologies in a carefully selected set of agro-climatic, geographic and socio-economic conditions;
- identified gaps in the available technologies;

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<sup>12</sup> PHHC, Component Description, Appendix C, para 5.4.6.

- supported the modification and development of new technologies; and
- developed recommendations for systematic programmes of post-harvest support suitable for donor financing or joint financing by government and donors.

Such a programme would similarly have:

- explicitly piloted training programmes;
- systematically observed their impact on the actual practices of farmers;
- determined constraints where practices were not modified to the extent envisaged; and
- developed revised training programmes and identified supporting measures necessary to increase the effectiveness of the training.

## 4.2 Inadequate Logical Framework

The logical framework is a useful tool for ensuring that Programme activities contribute systematically to their ultimate objective. Such frameworks need to be well thought through, should not confuse the logical progression from activities to overall objectives, and should be subjected during preparation to careful scrutiny by stakeholders. In the case of the PHPN, the logical framework would seem somewhat illogical and unhelpful for a number of reasons.<sup>13</sup> First, the ‘Overall Objective’ that refers to “improved village-level supply of post-harvest services and improved management of individual households of their post-harvest operations” would seem the means of leading to the ‘Immediate Objective/Purpose’ of “reduced losses of maize during threshing, drying and storage operations at village and household level”, rather than *vice versa*, as implied.<sup>14</sup> Second, the focus simply on reducing losses would seem unnecessarily narrow, given other post-harvest activities at the household and village level, especially milling, and also given the need to improve the efficiency of post-harvest activities both on-farm and, especially in Son La Province, at points downstream in the processing and marketing chain. In this regard, it is notable that the one small-scale technology that has been spontaneously adopted on a relatively large scale in both provinces is mechanised grain milling, an activity not covered by the PHPN.

The third level of the logical framework, ‘Outputs and Results’, includes two outputs of the Programme (*establishing PHPN offices and developing technical packages*), one result of this (*improved extension delivery messages*), and one outcome (*improved practices at household, village and trader level*) that would seem of the same level in the intervention logic as the ‘Overall Objective’. As a consequence of this loose specification, the logical framework excludes the critical step of adoption of improved

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<sup>13</sup> The PHPN logical framework is contained in Annex 18 of the Final Draft PHPN Report, dated December 2003.

<sup>14</sup> ‘Improved *management* of individual households of their post-harvest activities would also seem not to capture fully what was actually intended, which also included major changes to post-harvest *practices*.’

technology packages by farmers, traders and service providers. This is not a trivial omission, since the Programme to date has been judged a success on the basis of (a) a small group of farmers and traders using equipment that has been mostly donated to them and (b) farmers and service providers giving positive responses to questionnaires about their desires and intentions. There has been no attempt to monitor systematically the extent to which the new technologies and practices promoted have been spontaneously adopted or whether adoption has led to widespread reductions in post-harvest losses.<sup>15</sup>

#### 4.3 **The Sequencing of Preparation**

During preparation, as a core part of the Programme, a short-list of technological models was identified for promotion prior to selection of the districts and communes to be covered. This pre-supposes that there is a common set of problems across districts that can be addressed with a subset of the short-listed technologies, which would seem unlikely to be the case. Having adopted this approach, it would have been logical and efficient to select districts and communes on the basis of their ability to benefit from the short-listed technologies. Instead, selection was based predominantly on levels of maize production and, to a lesser extent, poverty. It would have been preferable to have (a) selected Programme districts, and possibly also communes, (b) determined the main post-harvest constraints in these areas, and (c) promoted technologies suited to addressing these constraints.

#### 4.4 **Well-Planned Training and Use of Established Delivery Systems**

The training programme is fully consistent with the provisions of the broad extension policies and the post-harvest strategies of the government.<sup>16</sup> By piloting the introduction of post-harvest activities into extension programmes, it seeks to fill a significant gap in government extension in the country's northern provinces.

The PHPN training plan was well developed during the preparation phase, with a carefully thought out sequencing of training of trainers from the provincial level through to the training of farmers. For each training course, the Programme Final Implementation Report contains details of the target group, entry requirements, objectives, teaching methods and techniques, resource organisations, facilities, evaluation methods and budgeted capital cost.<sup>17</sup> The training of senior staff was undertaken by a domestic service provider, while the training of extension staff and their training of farmers used the

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<sup>15</sup> Note that “demonstration models being replicated” is listed in the logframe as an ‘indicator’ of outputs and results. It should surely be an output in its own right, with a quantitative measure of the output being the indicator.

<sup>16</sup> See, in particular, the list of priority programmes and projects in: MARD, GOV/Danida, PHHC, ASP, *National Post-Harvest Strategy on Rice, Corn, Soybean and Peanut Until 2020*, Hanoi, January 2006.

<sup>17</sup> Final Implementation Report, Post Harvest Programme for the North, PHHC, ASSP, MARD, Government of Vietnam/Danida. Annexes 6-13 and 20.

existing public extension structure. Consequently, the training is potentially replicable over the entire highland farming areas of North Vietnam. Farmers were trained in groups of 10 and service providers in groups of 15.

Given the low level of knowledge amongst target beneficiaries of improved post-harvest methods prior to 2004, the Programme was designed to provide exposure to these methods during training through hands-on experience with the pilot demonstration plants established under the Programme.

#### 4.5 **The Issue of Affordability**

The changes in post-harvest practices promoted by the PHPN have been of two distinct types: those that involve changes that do not require significant investment and those that do, namely all the technological packages promoted. These packages involve the acquisition of polyethylene bags, shelling devices, stores and/or dryers. During formulation, there clearly should have been a serious attempt to address the issue of affordability of the packages to be promoted. This is especially the case given the focus on poor households. In the two PHPN provinces, such households live from day-to-day. They typically have no savings other than those held in the form of a pig or a few poultry, they have no access to credit, and consequently no possibility of investing in the promoted packages. It would seem that a clear distinction should have been made in the design of the Programme between on-farm investments that benefit small-scale farmers directly and downstream investments that benefit farmers indirectly and which are made by traders and other entrepreneurs who have the capacity to make investments. A distinction should also have been made between improved on-farm practices that require investment and those that do not.

In the event, the main means by which poor households have acquired the improved technologies has been as grants in kind. Such grants are a legitimate means of assisting poor households. Indeed, one of the achievements of the Programme has been that it has led to the Government, international and other bilateral agencies providing farmers with manual shellers, dryers and storage bins of the types promoted. However, this has been done in the absence of explicit recognition in the design of the PHPN of the lack of capacity of this target group of poor farm households to buy the promoted equipment. An appropriate PHPN design would have embodied (a) use of the Programme to systematically identify where and under what type of local organisational framework donations would give the greatest payoff in terms of poverty reduction, and (b) training focused specifically on the beneficiaries of donated equipment.

## 4.6 The Nature and Measurement of Losses

To a large extent, the success of the PHPN depends on the extent to which it has cut post harvest losses and, more importantly, on how well it has demonstrated the most cost-effective means of cutting such losses.

Given this, a deficiency of Programme design (and implementation) has been the cavalier treatment of the concept of losses. The starting assumption underpinning Programme design was that losses are obviously large and need to be addressed, and that there is consequently no need to consider the nature of losses in detail. We consider this to be a mistake since more accurate information on the size and sources of post-harvest losses are clearly relevant for the design of future programmes to address losses. During the Programme, there has been no serious attempt to analyse the nature and causes of post harvest losses in Son La and Ha Giang and no serious attempt to measure losses and the loss-reductions achieved by the Programme.<sup>18</sup> This will handicap the development of future efforts to reduce post-harvest losses.

The nature and causes of losses are complex. Some of the factors that complicate efforts to define and measure losses are as follows:

- A *loss* in weight can result in a *gain* in both the market value and market unit value of a consignment.
- On-farm loss in value at any point during storage depends on whether the grain is to be sold or used for home consumption, since the notional unit value of grain consumed on farm differs from the producer price of grain sold.
- Loss in value during storage depends on the length of storage. The relationship between time stored and quantity lost is not linear.
- The stock of grain used for home consumption is progressively depleted with the result that the percentage of the original stock lost depends on the degree to which a household is self sufficient.
- Grain which has deteriorated and is no longer usable for human consumption may still have a value as animal feed or for the distilling of spirits for human consumption.
- The unit value of loss on-farm loss during storage is a function of whether or not the deficit will reduce the amount that is surplus to on-farm needs, will increase

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<sup>18</sup> The PHHC did attempt to examine means of measuring losses by commissioning a report on *Income Definition in Post Harvest Process of the Integrated Crop Farm (rice – maize and bean)*, (PHHC, November 2005, draft). Although written during implementation of the PHPN and covering maize, the study only used maize data from Nghe An Province and concludes that, “Methods to preserve and equipments to avoid the loss of quantity and quality are greater of concern at the livestock feed processing enterprises compared to households”. (Para 2.4.2). The paper in its English version is difficult to understand but would appear to be analytically confused. Note also that the Final Implementation Report (Para 3.4.5) provided US\$ 5,000 for laboratory services and crop analysis to assist in accurate determination of post-harvest losses. Such analysis would contribute to measuring nutritional losses for farm households, but falls far short of the work necessary to address the quantification of losses adequately.

the shortfall that must be purchased, or will increase the shortfall that is provided to the household under aid programmes. Assessment is further complicated if the farm uses a part of the grain for animal feed or distilling.

Complications such as these mean that losses, especially those incurred during storage, are not usefully subjected to the generalisations that have characterised the literature and reports relating to the PHPN. Given such complications, it is clearly something of a nonsense to refer blithely to 'post-harvest losses', as if they have no end-use, time or quality dimension. For example, the core programme manual – *The Post Harvest Technology Handbook* - begins with a summary of post-harvest losses, that includes loss percentages for each post-harvest activity. These are not defined and there is not even any mention of whether the percentage losses quoted refer to weight or value. One consequence of the conceptually superficial approach to the main variable the PHPN has sought to address is that, despite the Programme being near completion, there is no accepted definition or set of definitions of post-harvest losses, and consequently no basis for rationally assessing the impact that the Programme has had on losses or of assessing the relative efficiency of different potential means of loss reduction.

In terms of establishing the cost-effectiveness of the PHPN and its impact on the target populations, a particular drawback of the superficial approach to losses is that it masks the differential impact of losses on farms of different types. For example, losses may not be of great importance for a very poor farm household that only produce sufficient grain for a few months subsistence; they are however likely to be damaging for a better-off farm household that, were it were not for losses, would have a small grain surplus that could provide an important source of cash income by supporting, for example, the fattening of a pig.

#### 4.7 **The Projection of the Cost-Effectiveness of the Promoted Technologies**

The PHPN Final Draft Report rightly stresses the importance during implementation of quantifying the net benefits that stem from using the technologies demonstrated. The Report provides indicative payback periods for the eight proposed pilot demonstration units.

The use of a payback period is an inadequate way of indicating the suitability of investments since it does not take account of the level of risk involved. Poor small-scale farmers understandably will not invest, even if they have the means to do so, unless they expect to receive high returns with little risk. Consequently, the annual margin earned from an investment, in addition to being large enough to pay for the investment in a small number of years, also needs to be high relative to the annual operating cost. The payback periods in the Draft Final Report are based on 'case studies' that appear in an earlier version of the report, dated December 2002. Examination of these case studies show that they embody markedly different risks for investors. The use simply of a payback period masks this fact. For example, the micro-scale grain dryer SH1-200, which has been widely promoted under the Programme, is shown as having a reasonably short payback

period of 2.7 years. However, this is based on a projected annual benefit of VND 1,400,000 and an ‘additional operating cost’ of VND 1,256,000, giving a ‘net benefit’ of VND 144,000. Clearly, a small reduction in the benefits below those assumed or an increase in costs above those assumed would wipe out the net benefit and lead to a loss, making the investment highly risky. In fact, both the cost of the dryer and the costs of operation have increased substantially since 2002 as the result of a need to add an electric fan to the original design. *On the price, unit cost and benefit assumptions used in the 2002 Draft Report*, this would have meant that the farmer would incur a net cost from using the dryer, even if the dryer itself were to be costless.<sup>19</sup>

In the case of the larger scale technology packages promoted, there is a need to show net benefits and returns in the context of the role that the technology plays as an integral part of the chain of processing and marketing, in which the owner of the investment package typically buys, transforms and then sells the commodity. Instead, the model employed in the Report of a ‘complete maize shelling, drying and storage system’ simply employs the assumption that the only benefit of the operation is that it leads to a 10 percent reduction in losses. This ignores the fact that the maize has been transformed from wet on the cob to a lighter, shelled and dried product of much greater market value. This case study bears no relationship to reality, where the majority of maize is shelled and dried by traders after they have purchased it from farmers, and where their income is a function not only of their weight and quality losses (which tend to be small) but also of their costs, and the difference between their buying and selling price. Moreover, the model provides for the maize to be stocked at the same premises at which they are dried and shelled, without any mention of how this would be organised, who would own the maize, and who would bear the price and other risks that are involved in storing a perishable good for sale into an unstable market.

Finally, it is remarkable that the vast difference in the projected payback periods between the eight proposed demonstration units, which ranged from 0.22 to over 8 years, was not at least considered deserving a comment in either the Final Draft Report or the Final Implementation Report.<sup>20</sup> If the payback period was indeed considered the only measure of the desirability of demonstration units worth presenting, one would have expected a long pay-back period to have led to a questioning of the worth of proceeding with the demonstration. This was not done, one result of which was that the only medium-scale

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<sup>19</sup> In other words, the cost of drying (excluding any cost associated with acquisition of the dryer) is greater than the value of the grain that, in the absence of the dryer, would have been lost. Although probably far too risky for a rational small-scale farmer to consider adopting, the situation regarding the SH1-200 is not quite as adverse as indicated by the 2002 Report’s estimates, since these are wrongly calculated, in effect double-counting the annual cost of investment in the dryer. A correct working of the data gives a payback period of only 1.8 years but the margin between the net benefits and costs remains small (VND 224,000 net benefits versus costs of VND 1,176,000). These net benefits would have been more than wiped out by the increase in the cost of the dryer.

<sup>20</sup> The payback periods are present in both these reports. See Table 7 in each report.

package promoted – that with the projected 8-year plus payback period – has proved not to be commercially attractive for potential investors.

#### 4.8 **The Need for Flexibility during Implementation**

The Draft Final and Implementation Reports emphasise that neither the areas of intervention, the schedule of technologies nor the crops contained in the reports are definitive; that it is essential that the Programme be implemented with flexibility; and that, in particular, “Adequate flexibility is essential to allow the introduction of new concepts within the budget line for the pilot demonstration units.” This provision for flexibility gave scope for the correction of many of the above design deficiencies during implementation.

In the event, the PHPN has suffered from a lack of flexibility to respond to deficiencies that were readily evident to those implementing the Programme. The effect of this is most evident in Son La Province, where the introduction of hybrid maize has resulted in maize becoming a cash crop for both large and small-scale farm households. Maize is sold immediately after the harvest, often on the cob, with only small amounts being stored on-farm to feed small numbers of chickens and pigs. This is an efficient system, since maize need only be dried once by a large-scale trader to meet the specific needs of orders from distant large-scale feed millers. The promoted on-farm small-scale shelling/drying/storage package has little relevance to this situation. The Team also observed other inconsistencies not only in Son La but also in Ha Giang between the technology pilots and the situation on the ground. For example, the scale of beneficiary farms is much larger than the poor farms targeted. The justification advanced for this is that the relatively sophisticated trained farmers will disseminate the practices that they have adopted to the less progressive neighbours. However, such a “best neighbour practice” was not always observed in the communes visited and it would seem that it is unlikely to take place to a significant extent without the establishment of specific, formalised dissemination arrangements. For example, the Assessment Team found poor villagers in Va Chai and Huu Vinh Communes (Yen Minh District, Ha Giang Province) living near demonstration sites who had not seen the demonstration silo or dryer in their near neighbour’s house.<sup>21</sup> A further example is the selection of a Phong Lap Commune for the second phase of the Programme and the promotion of small-scale maize post-harvest technology despite the fact that the main staple of the commune is cassava and the small amounts of maize that are grown are exported from the commune immediately after harvest. In response to the Assessment Team’s questioning, commune officials

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<sup>21</sup> In Va Chai all three small farmers interviewed (two men and one woman, in two different villages) had not seen the demonstration silo in the neighbouring house, and only one knew of its existence. In Huu Vinh, neither of the two poor farmers interviewed (one man and one woman) had visited their local demonstration silo.

revealed that they would have much preferred assistance with the drying of cassava but were informed that this was not possible because the PHPN was a programme for grain.

PHPN staff in the Programme provinces and districts reported to us that they had repeatedly reported inconsistencies of the above types but that no adjustments to the Programme had been effected or approved.

## 5. THE IMPACT OF PROGRAMME ACTIVITIES

### 5.1 Training

#### 5.1.1 Background

Vietnam's extension system is comprehensive in terms of its structure and coverage, with extension staff positioned at all levels down to the smallest administrative unit, the village. As one would expect, the provincial and district staff tend to be of good calibre, but the very large number of lower level staff means that the effectiveness of the system is patchy at the commune and especially the village levels. The present extension system was introduced in 1993 by Decree 13 CP (1993). This decree includes training in economic management and market information amongst the functions of the extension service. However, over the decade following publication of the decree, the management of marketing and post-harvest activities tended to be given little emphasis by extension workers relative to crop production and livestock husbandry technologies and practices.

#### 5.1.2 Activities

The main activity under the PHPN has been training, with the ultimate aim of improving the post-harvest activities of farmers, traders and other service providers.<sup>22</sup> The training provided by the PHPN is summarised in Table 3, overleaf, which shows the courses provided, the number and types of persons trained, and the phasing and duration of this training analysed by the two PHPN provinces and the initial and sustainability periods.

Overall, implementation has been impressive, with courses and refresher courses being carried out in accordance with the planned schedule, sometimes with the target numbers being exceeded. In the first year of the Programme a total of 427 training programmes were conducted involving 4,369 participants. In total, during the initial two-year phase, the Programme provided within the two provinces direct training to a total of 33 PHPN staff and their counterparts, 160 extension workers, 9,600 small-scale farmers, 1,920

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<sup>22</sup> It is conventional in Vietnam to refer to those engaged in post-harvest activities, other than farmers, as 'service providers', including traders engaged in processing and drying agricultural commodities on their own account (i.e. traders who have purchased the commodity from farmers or other traders and therefore own it while engaging in the 'service'.) This is in line with the definition used by some international agencies, including FAO.

**TABLE 3****TRAINING COURSES AND NUMBERS TRAINED**

	Training course	2004- 2005	2006
<b>Son La</b>	Master course on PHT and extension method for provincial officials and PPHPN staff.*	18	0
	TOT on PHT and extension method for extension workers from 4 districts**	80	40
	Post-harvest technology for medium and small farmers	4,800	2,400
	Post-harvest technology for progress farmers	960	
	Business and Post-harvest technology for Service providers	41	0
	Post-harvest technology for young commune union members+	0	70
<b>Ha Giang</b>	Master course on PHT and extension method for provincial officials and PPHPN staff.*	15	0
	TOT on PHT and extension method for extension workers from 4 districts**	80	100
	Post-harvest technology for medium and small farmers	4,800	2,500
	Post-harvest technology for progress farmers	960	500
	Bussiness and Post-harvest technology for Service providers	44	0
	Agricultural technology and post-harvest technology for village extensionist***	0	1,080

\* Supplemented by a refresher training course in 2005 for 17 participants drawn from the two provinces. \*\* Supplemented by a refresher training course for 47 participants drawn from the two provinces. + 3-day course organised by the Provincial Extension Centre in cooperation with the Youth Union. \*\*\* Supported by the Provincial Agricultural Extension Centre, with funding from Programme No. 135. This training covered agricultural technology, including post-harvest technology.

**DURATION OF COURSES**

Training course for provincial officials and PPHPN: 5 weeks

Training course for extension workers : 2 weeks

Training course for medium and small farmers: 8 monthly half-day sessions.

Training course for progressive farmers: 8 monthly one-day lessons.

Training course for service providers: 1 week

Training course for village extensionist: 2 half days

progressive farmers and 85 service providers. During the 2006 sustainability phase of the Programme, a further 140 extension workers and 4,900 small-scale farmers were trained as well as a further 500 progressive farmers in Ha Giang Province. In addition during 2006, using their Extension Training Centres, DARD in Son La trained 70 young commune workers in post-harvest technology and DARD in Ha Giang trained 1,080 village extension workers, using funding from the Government Poverty Reduction Programme, normally referred to as 'Programme 1-3-5'.

The PHPN coverage of extension staff and farmers in the Programme districts is shown in Table 4.

**TABLE 4: PROPORTIONS OF FARMERS AND EXTENSION STAFF AT THE DISTRICT AND COMMUNE LEVELS TRAINED IN THE PROGRAMME DISTRICTS, 2004-06**

Province	Farm Households			Extension Staff		
	Total	Trained	%	Total	Trained	%
Son La	79,416	8,160	10.3	167	120	71.9
Ha Giang	56,060	8,760	15.63	108	180*	160.0

\* Includes some staff from outside the district and double counts those trained on two occasions.

In accordance with the Implementation Plan (see section 3.2), the training programme was supported by the production of a set of manuals and other printed training material. Separate manuals on post-harvest techniques were produced for small-scale and advanced farmers. In addition, the Programme produced three technical handbooks, 8 leaflets and 8 posters.

### 5.1.3 Impact

#### - The Relevance and Quality of the Training, Training Manuals and Handouts

Since the Assessment Team could not observe the training in practice or farm households engaged in post-harvest practices, our assessment of the relevance, quality and impact of the PHPN training programme is necessarily based on (a) an evaluation of the training manuals and other training material produced, (b) responses to the KAP surveys, and (c) interviews with extension officers and farmers.

The training manuals and handouts, in most respects set out in an easily comprehensible form information that is accurate and is pertinent to the issues, problems and technologies being addressed. In general the manuals contain readily comprehensible text written in

Vietnamese, which is amplified by pictorial illustrations.<sup>23</sup> The manuals are well presented and printed. The posters are particularly impressive being well designed, printed on good-quality paper and supplied in plastic tubes. Attention was paid to making their content and presentation suitable to the ability levels of the target groups of staff, small-scale and advanced farmers, although the leaflets could be improved by simplifying the text and partly replacing text with further illustrations and captions. However, the lack of translations into the languages of the main ethnic minorities meant that a large proportion of the small-scale farmers could do no more than look at the illustrations. Those involved in training farmers explained to the Assessment Team that this deficiency was less serious than it might appear due to the large proportion of illiterate farmers among the trainees. They also noted that the deficiency was partially offset by the fact that they could use the manuals as the basis for making verbal explanations to farmers in the vernacular.

The KAP surveys, coupled with findings during our field visits indicate that trainees from the level of provincial staff through to small-scale farmers are generally appreciative of the relevance and quality of both the training and supporting reference material that they received. Most stated that they were satisfied with both the content and quality. In general, our conclusion is that extension staff down to the level of commune extension workers who have at least a vocational education level were able to understand the training and absorb its contents. Most of the trained farmers interviewed during the course of the Assessment Team's field visits reported that they now understand when to harvest maize in the field, how to reduce moisture levels in harvested rice and maize, and how to control insect damage during storage. As one would expect, advanced farmers were in general able to absorb and make greater use of the training than small-scale farmers. To an extent, these positive conclusions of the Assessment Team on the quality and the impact of the training programmes contrasts with the 2004 KAP survey of farmer participants in the training scheme, which showed that only 41% had improved their knowledge, attitudes and practices.<sup>24</sup>

Following our fieldwork and review of the training manuals, the Team considers that the main drawback of the training and accompanying manuals was that, at the level of the farmer, they were unnecessarily technical in content and, of course, difficult for the large percentage of illiterate farmers to fully comprehend. In this regard, it is notable that the more advanced and commercially minded farmers in Son La have tended to retain their training manuals, unlike those in the largely subsistence districts of Ha Giang, such as

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<sup>23</sup> However, note that some Vietnamese terms used in the manuals are incorrect. For example: “nghệ cứu” on page 9 of “Introducing Post Harvest Equipment for Maize” is incorrect as is “sản suất” that appears on the cover of training manuals on post harvest technologies for small and medium farmers.

<sup>24</sup> It would further seem likely that this enumerated percentage was biased upwards by the need for illiterate trainees to complete questionnaires using an intermediary, usually an extension officer.

Dong Van. However, it should be noted that, in his review of the 2004 KAP survey, the PHPN Monitoring Officer concluded that the knowledge of farmers in Ha Giang (although not their practices) *had* increased significantly after the training.

In general, as one would expect with such a new topic introduced for the first time, farmers' awareness of post-harvest issues and the potential offered by improved technologies is currently running ahead of changes in their practices. The Team observed that most small-scale farmers are continuing with their former practices, especially the storage of maize on the cob in the lofts of their houses.

### **- Institutional Impact and Sustainability of the Training**

The exposure of government extension staff to the training has had the important impact of putting post-harvest activities firmly on the extension agenda. The training methods have also led to involved extension workers being more aware of the importance of a participatory approach to extension. The KAP surveys and the Team's interviews show that many farmers are now aware that they can improve their livelihoods through the adoption of improved post-harvest practices. Consequently, one would expect them to see it as in the interest to actually adopt these practices. Where the practices, such as changing the timing of the harvest, are costless, they will presumably do so, unless they perceive that it will involve a risk of some kind.<sup>25</sup>

PHPN training continued roughly as planned during the sustainability phase of the Programme, with the direct costs being funded by the Government, principally through its 1-3-5 Programme. Programme reports show that the target of training a further 5,400 farmers was achieved, with over 5,000 being trained in the first six months of the period. The provincial DARDs report that their intention is to continue to train farmers in post-harvest practices by building this into their established extension programmes. This, of course, is the most appropriate means of continuing with post-harvest extension following closure of the PHPN. It does, however, mean that post-harvest activities do not have a separate budget line, which prevented the Team arriving at conclusive verification of the institutionalisation of post-harvest extension within 2007 programmes.<sup>26</sup> However, it would seem that some institutionalisation is assured by the momentum generated by the Programme and by the successful transfer to the Government of the main funding burden for post-harvest training during the sustainability period.

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<sup>25</sup> Note that changing the time of the harvest could conceivably bear a cost if there are changes over time in the opportunity cost of family labour.

<sup>26</sup> Ha Giang DARD informed the Team that a total budget of VND 1 billion has been assigned for agricultural development programmes focussing on post-harvest technology. We were unable to confirm this total or the funding sources through inspection of hard budget data.

In general, successful institutionalisation would seem more likely in Ha Giang than in Son La. This is partly because of the greater need for improved *on-farm* post-harvest extension in Ha Giang, but also because of the use of Government funds in the Province to extend formal post-harvest training to village extension workers. It is workers at this level who have most contact with farmers and it is important that they are trained systematically in post-harvest techniques.<sup>27</sup>

- **Impact of the Training on Local Manufacturers of Low-Cost Post-Harvest Technologies.**

In line with the provisions of the Final Draft Report and Final Implementation Report, there was no specific training programme for local fabricators of the promoted equipment. However, a number of fabricators were invited to attend the training courses on post harvest technologies for progressive farmers and for service providers. The Team held discussions with one such fabricator in Mai Son town, located in Mai Son District of Son La Province, who had attended the course for service providers in 2004. He considered that the course was of some use in terms of his efforts to make appropriate equipment of good quality, but that it would be useful for the training programmes to give more information on the design, structure and operation of post-harvest equipment.

In general it is worth noting that the promoted dryers and storage bins are all of a simple design that can be readily fabricated in local workshops. This applies especially to the metal storage bins. Since most potential local fabricators know of the technologies due to the PHPN demonstrations, there would seem that there are now no knowledge of skills constraints to local manufacture. The main constraint to widespread availability of demonstrated units for purchase is the lack of high-volume demand from farmers and traders, which deters fabricators from making units until they have received a firm order.

There are no hard data on the proportions of each type of technology that have been imported, made locally by private firms, and made by the VIAEP. However, from anecdotal information collected during our fieldwork, it would seem that most hand shellers have been imported from China, including virtually all of those *purchased* by farmers, that the majority of metal storage bins have been fabricated locally by small-scale enterprises, and that the majority of SH1-200 dryers have been made by the Institute.

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<sup>27</sup> The Team found the effectiveness of the programme at this level to be patchy and critically dependent on the ability and motivation of commune-level extension staff, some of who had formally trained village extension staff while others reported that they had had insufficient time to do so.

## 5.2 Pilot Demonstration Units

### 5.2.1 Background

The Programme has established demonstration units that employ improved technologies to address problems that farmers encounter in drying and storing their grain on-farm. Maize and mechanised grain shellers were also demonstrated as an alternative to the time-consuming hand shelling of maize. Since grain can be shelled and dried off-farm either for a fee or by a trader, the Programme also demonstrated medium-scale technologies for shelling and drying. Three larger-scale demonstration units were also established, which included a warehouse in addition to a sheller and dryer.

Issues relating to the design of the PHNP pilot demonstration programme are discussed in Section 3, above). The pilot demonstrations of improved technology packages had three purposes:

- testing the technical and financial efficiency and effectiveness of improved technology packages operated under field conditions;
- demonstrating this technology to extension staff, farmers and service providers;
- directly benefiting those persons involved in the demonstrations, both the farm households and traders who received the donated technology and those whose grain was shelled, dried and/or stored using it.

### 5.2.2 Activities

During the first phase of the Programme to December 2005, some 210 pieces of equipment were demonstrated, 106 in Son La and 104 in Ha Giang. These comprised bags for emergency on-farm storage, manual and mechanical maize shellers, a small vertical dryer, flat bed dryers of three capacities, and two types of on-farm storage for dried grain: an improved version of a traditional wooden store designed to facilitate drying and a scalable corrugated storage bin. All the demonstrated equipment was either designed or developed at MARD's Vietnam Institute of Post-harvest Technology (VIAEP), and the majority was also manufactured by the Institute. Summary details of the main technologies demonstrated are contained in Annex C. The numbers provided under the Programme and by the government are shown in Annex D.

Table 5, overleaf, contains an assessment of key characteristics of the technology. Throughout the programme, the aim was to demonstrate integrated units of complementary technologies, such as a manual sheller, a small-scale dryer and a storage bin. This was generally done, although there were some instances of single pieces of equipment being given to farmers.<sup>28</sup>

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<sup>28</sup> The need for equipment to have been donated and used in complementary packages should perhaps have been emphasised more strongly in the PHPN Draft Final and Final Implementation Reports, especially as the case studies for the small-scale equipment covered single pieces of equipment only. Other programmes that have donated equipment of the types demonstrated have also not always provided this in rational packages.

**TABLE 5: CHARACTERISTICS OF THE TECHNOLOGIES DEMONSTRATED BY THE PHPN, 2003-2006**

	Number Demonstrated	Approximate 2006-07 Cost ('000 VND)	Daily Capacity (kg)	Technically suitable to climate and fuel supply?	Easy to use? <sup>1</sup>	Adversely affects the grain?
<b>Immediate post-harvest storage</b>						
Emergency storage in PP bags	40	N/A	25 per bag	Yes	No	Sour taste and smell
<b>Shellers</b>						
Manual	80	110	200 <sup>2</sup>	Yes	Yes	No
TN-4	2	12,000	3,200 <sup>3</sup>	Yes	Yes	Small increase in broken grain
BBTH 2.5	1	N/A	2,000 <sup>3</sup>	Yes	Yes	35% broken grain
<b>Driers</b>						
SH1-200 vertical	60	2,700	250 <sup>4</sup>	Problems with electricity cuts	Yes	No
SV-500 flatbed	20	9,000	1,500 <sup>5</sup>	Problems with electricity cuts	Yes	No
SH-4 flatbed	2	38,000	12,000 <sup>5</sup>	Problems with electricity cuts	Yes	No
SH-12 flatbed	1	85,000	24,000 <sup>6</sup>	Problems with electricity cuts	Yes	No
<b>Storage</b>						
Improved traditional external	40	N/A	5,000 <sup>7</sup>	Unsuited to climates	Yes	Slow drying: mould
Corrugated metal silo (3 rings)	80+45 in schools	800	900	Yes	Yes	No
Corrugated metal silo (4 rings)	0	1,000	1,200	Yes	Yes	No
Corrugated metal silo (5 rings)	0	1,200	1,500	Yes	Yes	No

Source: PNPB reports and interviews.

Notes: <sup>1</sup> Ease of use for small-scale farmer or service provider, as appropriate. <sup>2</sup> Very rough estimate based on interviews with households. <sup>3</sup> One 8-hour shift. <sup>4</sup> One 14-hour drying period. <sup>5</sup> Three 6-hour batches. <sup>6</sup> Two 6-hour batches. <sup>7</sup> Whole cob. Note that all other capacity data refer to shelled grain.

In addition to the demonstration units, the Programme also supplied 45 metal storage bins to schools in Ha Giang Province. There was no provision for this in the Programme Final Draft Report or Programme Implementation Report, but it was in line with a suggestion in the ASPS Review Aide Memoire of May 2005 that the PHPN could reach a greater audience by demonstrating techniques at schools.

All the demonstrations, other than silos at schools, were located at farm homesteads or at the premises of traders, with the equipment being provided free of charge in return for an undertaking that potential users could visit the site. The farmers and traders were required to cover the operating costs of their demonstration. A common practice adopted was to provide the equipment to the more important persons within the village, including village heads. The rationale cited for this is that such farmers are most likely to be able to operate the technology better and at higher capacity and to demonstrate it more effectively than poorer farmers. The practice has the disadvantages that poorer farmers may view it as not suited to their more modest circumstances and that it does not test whether the smaller-scale, generally less well educated farmers targeted by the Programme can cope with the technology.<sup>29</sup> The Team was pleased to note that there were exceptions to this practice. For example, in Thuan Chau District of Son La Province and Van Chai Commune of Dong Van District in Ha Giang Province the demonstration units had predominantly been placed with typical, rather than influential farmers.

### **5.2.3 Impact**

No data are available on spontaneous adoption of the technologies by small-scale farmers and traders. Our discussions with DARD, district and commune staff and observations in the field indicated that, with the exception of shellers, spontaneous adoption by farmers has been low.<sup>30</sup> There has been substantial investment by traders in mechanised shellers and flatbed dryers, especially in Son La, but the view of both local traders and government staff is that at least some of this would have taken place in the absence of the Programme, since the technologies already existed prior to the Programme and private investment in them had already commenced. Notwithstanding this, it would seem likely that all the three main Programme activities have accelerated the process of flatbed adoption. This will have increased competition amongst traders to acquire grain and is likely to have raised producer prices, thereby benefiting Son La Province farmers, including low-income small-scale farmers. 200 SH1-200 dryers.

As noted, the demonstrations, coupled with the publicity given to the technologies in the Programme's media campaigns has led to the Government and other donors supplying farmers with manual shellers, small-scale dryers and metal storage bins. There is reportedly also a strong likelihood that the Government will begin providing metal

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<sup>29</sup> At one village, the team observed that the village head had substantially modified the structure of the demonstration storage bin donated to him by the Programme so that it could fit on the balcony of his house.

<sup>30</sup> Thus, the statement in section 4.6 of the PHHC Annual report of 2005 that, "the farming community have embraced and adopted the technical innovations recommended," would seem misleading.

storage bins to schools in low-income districts, following the success of the PHPN-provided bins in conserving grain stored at schools. Ha Giang is also reported to have placed orders in late March 2007 for substantial amounts of post-harvest equipment to be donated to farmers under the provincial 1-3-4 Programme.<sup>31</sup>

Training under the PHPN was hampered by the fact that the first of the pilot demonstration units only became operational in September 2004, with the final pilot installations only being established in March 2005 and with final inspection only being completed in June 2005. This meant that, until the sustainability phase, most of the training of farmers was done in the absence of access to demonstration units. In total, there were only 40 visits to demonstration sites in 2005 involving 1,563 participants.<sup>32</sup> This compares with a total of 9,600 farmers trained during 2004 and 2005.<sup>33</sup> This was not a problem during the sustainability phase, during which trainees had access to the demonstrations established in the two first years of the programme.

#### **5.2.4 Findings and Lessons Learned**

##### **- Effective testing of the physical impact of the technologies and their ease of use.**

In its role as a pilot, the Programme successfully demonstrated the following:

- **Technical effectiveness and suitability of the technologies demonstrated.** The pilot demonstrations showed that seven of the nine technologies work well and can be managed easily by farmers and traders after only a short period of training.
- **Improved technologies shown to have great potential for reducing losses.** The demonstrations further showed that the technologies, when used in appropriate combinations, can lead to very large savings in grain by cutting on-farm losses during storage. These savings are generally well in excess of those assumed in the models employed during the preparation of the Programme.<sup>34</sup> The reduction in losses cannot be quantified with any accuracy due to a continued lack of information on the size of post-harvest losses using traditional drying and storage methods.<sup>35</sup> However, from information gathered by the team during its interviews with farmers, it would seem that, for small-scale farm households which are just

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<sup>31</sup> This is a programme for reducing poverty and hunger, similar to the central government 1-3-5 programme.

<sup>32</sup> Even if these visits covered two or more demonstration units, a total of 40 visits would see small compared with the total of 203 pilot demonstration sites eventually established (plus 45 additional demonstration storage silos).

<sup>33</sup> There is no mention of any visits to the demonstrations in the PHHC 2004 Annual Report, (see: Final Draft, January 2005.) One would expect the number of visits in 2004 to have been small, given that most demonstration units were completed during the last quarter of 2004 and in 2005.

<sup>34</sup> See Annex 19 of the PHPN Draft Final Report dated December 2002.

<sup>35</sup> Section 4.6 discusses losses in detail.

self-sufficient and rely throughout the year on own-produced and stored maize for their staple food needs, adoption of the demonstrated technologies would lead to a reduction in annual losses of at least 30% of the amount harvested. Such a reduction in effect increases the annual usable supply of own-produced maize by over 40%.

- **Maize shellers are effective in reducing post-harvest labour input and complement the improved drying and storage technology.** Traditionally, subsistence farm households in the North of Vietnam store maize on the cob and only shell it as it is required for consumption by the family or the farm's livestock. Both the manual maize shellers designed for on-farm use and the electric and diesel shellers operated by service providers and traders significantly reduce the time that farm-households must devote to shelling. This reduction is of benefit in itself. It also permits the rapid shelling of wet maize that must take place prior to use of improved drying and storage techniques.
- **Elimination of unsuitable technologies from the set of packages promoted.** Two of the technologies proved unsuitable for conditions in the Programme districts. An improved traditional external store designed to wind-dry maize proved unsuited to the damp conditions that prevail in the highlands during the post harvest period. Its adoption in Ha Giang also proved to be problematic since the store resembled a traditional resting place for the dead. The use of sealed polyethylene bags as an emergency measure until sun-drying could take place proved to be a difficult technology for small-scale farmers to comprehend and implement effectively and also led to the maize acquiring a sour taste.<sup>36</sup> Both technologies were dropped from the Programme during the sustainability phase. The weeding out of unsuitable technologies is an important part of a pilot programme and, in the case of the PHPN, will ensure that only effective and manageable technologies are promoted region-wide.
- **Schools benefit from the use of galvanised storage bins.** Schools traditionally have acquired grain in large consignments which they have stored in wooden boxes. The introduction of galvanised bins has shown that they have potential to reduce losses during storage significantly. However, the bins supplied under the Programme are designed for small-scale farms and are not large enough to accommodate the amount of grain that comprises a typical delivery to a school. The implication of this finding is that when the government and/or donors provide further bins to schools, these should be designed to hold a typical delivery in a cost-efficient manner.

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<sup>36</sup> The technology relies on the bagged wet maize naturally generating carbon dioxide, which reduces deterioration.

The above findings are all of significance for the design of future post-harvest support programmes. Thus, while our assessment is critical of some aspects of the design and implementation of the PHPN, we consider that the Programme is likely to improve the design of future post-harvest support programmes and, consequently, is likely to prove to have been cost-effective.

#### **- The importance of compatibility with value chains**

The PHPN has shown that it is essential that demonstrated technologies are compatible with existing or emerging value chains. This has not always been the case during implementation of the PHPN. The Final Implementation Report notes that, “the flat bed dryer predominates in the province (Son La) and the pilot demonstration plants should address the deficiencies in current operations.” In the event, 20 small-scale SH1-200 dryers were supplied to the Province in the initial phase, with only one small SH-4 and one large SH-12 flatbed dryer.<sup>37</sup> The SH1-200 dryers are largely unsuitable for Son La where little maize is retained on farm (see sub-sections 3.3). The SH-4 dryer is not commercially viable. This meant that only one flatbed dryer of a viable size was demonstrated in the entire Province, despite the fact that such dryers (used in combination with electric shellers) are, as recognised in the Final Implementation Report, the predominant means of drying grain within the Province. In this regard, it should be noted that it is not always necessary for post-harvest measures that benefit small-scale farmers to be located on their farm or owned or operated by them. Given that there is a high level of competition between the many flatbed dryers in Son La, the benefits from improvements to their efficiency will partly be passed back to small-scale farmers in the form of higher producer prices. The key need to increase the efficiency flatbed drying was not reflected in the sustainability phase, which saw the Programme demonstrating on a farm a further 20 small-scale SH1-200 dryers<sup>38</sup>

#### **- The need to evaluate financial and economic viability**

Now that the technical effectiveness and suitability of the shellers, dryers and storage has been tested, it is essential that their financial and economic viability be evaluated systematically. This requires that they be operated on a commercial basis by individuals and firms or as sustainable enterprises by formally established groups of farmers. Under the PHPN, there appears to have been no systematic attempt to do this. We found demonstrations run by individual farmers, by village heads, by informal groups, and by extension staff. Some were seeking to run them as a profit-making business (without any capital cost), some were running them as a service for friends and neighbours on a break-even basis, and some were providing services informally in return for small favours.

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<sup>37</sup> The Programme also demonstrated 20 improved traditional stores and held 20 demonstrations of emergency storage using polyethylene bags.

<sup>38</sup> Importantly, during the sustainability phase, the SH1-200 was introduced into Ha Giang, where the structure of agriculture makes it more suitable than in Son La.

None was making provision for depreciation or accumulating a fund to cover repairs or the purchase of spare parts. Although the intention was to monitor the demonstrations to determine net benefits, we were unable to find any evidence that this has been done successfully. A key lesson is that, for pilot activities, such as the demonstration units, systematic monitoring and evaluation must be given top priority. Records of all resources used, physical throughput and financial transactions must be kept. These must be collected systematically by staff given this explicit task and a senior staff member must be made responsible for entering the data centrally and for processing and analysing it. Given, that sound information is the key to developing effective support programmes, it is essential that every last piece of potentially available information is squeezed from sources such as the PHPN demonstration units.

### **- The sequencing of activities**

The Final Implementation Report contains only one short paragraph (3.6.1) on the Programme's workplan and implementation schedule, relying on reference to an annex (Annex 19). This annex, in turn, simply shows that all the activities other than the establishment of offices will be ongoing for the last 21 months of the 24-month programme. This is clearly inadequate, since the manuals and demonstration units were to be used in the training and consequently needed to be in place prior to the training. As noted, in the event, the demonstrations were only established after a substantial proportion of the training had taken place. A clear lesson to be learned is that it is important that a Programme must embody a logical and clear, pre-planned sequencing of programme activities. If such a sequencing cannot be accommodated within the planned programme time period, either the period needs to be extended or the programme substantively redesigned.

## **5.5 Use of the Mass Media and Audio-Visual Presentations**

### **5.3.1 Background**

No provision is made in either the Final Draft Report or the Final Implementation Report for the use of mass media for the provision of information and training to farmers. Following a decision by the PHPN management board, a programme aimed at the training of farmers in post-harvest practices was broadcast on national TV (VTV2 and VTV2) two times during November 2005 and December 2006. More widespread use of the mass media by the PHPN during the sustainability phase followed a recommendation to do so by the 2005 Danida Annual Sector Review (ASR).

### 5.3.2 Activities

During 2005, in line with decisions by the two provincial DARDs, the PHPN undertook mass media campaigns in both Son La and Ha Giang Provinces. Five short programmes were broadcast once on provincial TV in Son La and eleven times by district TV stations. A further, lengthier TV programme designed to introduce the Sustainability Programme was broadcast in Son La in 2006. In Ha Giang, six TV programmes giving an introduction to and an overview of the PHPN were broadcast in 2005-2006. Use was also made of articles on post-harvest technologies in a provincial newspaper published in Ha Giang. Ten issues had short articles on post-harvest topics in a 'Friends of Farmers' column, and two issues had full page presentations. Details of the use of the mass media by the PHPN are given Table 6. The content of the TV programmes was prepared by the PHPN. The programmes were shot by TV-station staff and featured Programme officers and farmers. The PHPN was charged by the TV stations for airtime at the rate of VND 1 million (USD 62-63) per minute, giving a total cost in Son La Province for one showing of the full set of 6 programmes of VND 70 million.

**TABLE 6: MASS MEDIA CAMPAIGNS CONDUCTED BY THE PHPN PROJECT**

	Topic	Media	Time	Duration
	<b>National level (*)</b>			
1	Introduction of the PHPN	VTV 1	Nov. 2005	4 minutes
2	Processing and storing methods for maize	VTV 2	2006	35 minutes
	<b>Son La (**)</b>			
1	Introduction of the PHPN	Son La TV station	Sept. 2005	8 minutes
2	Introduction of SH1-200 dryer	Son La TV station	Sept. 2005	7 minutes
3	Introduction to silos for grain storage	Son La TV station	Oct. 2005	5 minutes
4	Introduction to Flat-bed dryers	Son La TV station	Oct. 2005	8 minutes
5	Review of PHPN in Son La province	Son La TV station	Dec. 2005	7 minutes
6	Introduction of the Sustainability Programme	Son La TV station	2006	35 minutes
	<b>Ha Giang (***)</b>			
1	Introduction and overview of post-harvest programme in Ha Giang	Ha Giang TV station	2005-2006	6 news shows
2	"Friends of Farmers" special column on post-harvest technology	Ha Giang newspaper	2005-2006	10 columns and 2 special pages

Sources: (\*) PHPN Programme Office. (\*\*) PHPN-Son La Report. (\*\*\*) PHPN-Ha Giang Report.

Unfortunately, despite the widespread availability of TV sets amongst small-scale farmers, few farmers could view the provincial and district broadcasts, since most rely on Chinese made satellite dishes for their reception, which can only pick up the three national VTV channels. In the case of the use of newspaper articles in Ha Giang, the coverage of small-scale farmers was relatively low due to the high rate of illiteracy and a lack of access to newspapers in the typically remote areas in which most farmers live in Ha Giang.

Recognising the limited effectiveness of using the mass media to reach farmers, during the sustainability phase, the Programme sought also to expose farmers to video-based information and training programmes using video CD ROMs (DVDs). These were distributed to district, commune and village-level officers, who arranged for the programmes to be shown at farmer-group meetings and cultural events.

### **5.3.3 Impact**

Assessment Team staff viewed the videos and found them to be of good quality and of relevance. They provide specialised and logical step-by-step guidance for maize farmers and they are easy to comprehend, with technical messages being accompanied by practical demonstrations made in real-life situations.

The team were unable to obtain hard data on numbers of farmers who had been exposed to the local video presentations, but partial information gathered during interviews suggest that at least half of all farmer groups in target communes attended such presentations. The Team's discussions with farmers indicate that the presentations were a more effective means of reaching a wide rural audience than were the TV campaigns and attempts to newspaper articles.<sup>39</sup> Video presentations also have the advantage that they can be designed specifically for the training of small-scale farmers, without the need to add more general awareness-raising of the Programme as a whole.

### **5.3.4 Findings and Lessons Learned**

While not a substitute for hands-on training, video presentations form a cost-effective means of supplementing conventional training programmes and demonstrations. They are an excellent means of introducing large numbers of farmers to new technologies and to the potential benefits that they can gain from them.

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<sup>39</sup> However, note that TV is well-suited to short general programmes to raise public awareness and to disseminating information on technologies beyond the relatively small areas covered by pilot programmes such as the PHPN.

## 6. **CROSS-CUTTING ISSUES**

### 6.1 **Targeting**

In line with the ASPS, an important objective of the PHHC is to focus on poor farmers, women and ethnic minorities. As a part of the PHHC, the PHPN was subject to this objective. There is no mention of the objective of targeting these groups neither in the PHPN Final Draft Report nor in the PHPN Final Implementation Report. The Programme design omitted means of operationalising such targeting and contains no provision for monitoring the extent to which the target groups have benefited.

Notwithstanding this, the broad findings of the Assessment Team are that ethnic minorities were well-targeted and that the targeting of women was satisfactory given the context of the poor mountainous provinces of Son La and Ha Giang. The poor were less well targeted, although poor households have benefited from the Programme, especially the training.

Data that show the extent to which ethnic minorities and women participated in the training are available and are summarised in Table 7. Although farm households are routinely classified by the Government by income group to allow them to be targeted in food and other welfare programmes, no data are available on the participation in the PHPN by those classified as poor.

#### **6.1.1 Targeting ethnic minorities.**

It will be seen from Table 7 that the targeting of PHPN training on farmers from ethnic minority groups was highly successful, as, in general, as was the placement of the pilot demonstrations in ethnic households. This reflects the fact that the provinces were well-selected from the point of view of ethnic minorities, with both provinces having less than 18 percent Kinh (Vietnam's predominant ethnic group) in total (see Table 1) and even smaller percentages of Kinh farm households. Furthermore, the sequenced progression of the training of trainers resulted in farmers being trained by extension staff who were multilingual, able to be trained and read manuals in Vietnamese and to train in the local vernacular.

**TABLE 7: TARGETING OF PHPN TRAINING OF FARMERS,  
ANALYSED BY GENDER AND ETHNIC GROUP**

(%)

	Son La		Ha Giang	
	Females	Ethnic Minorities	Females	Ethnic Minorities
2004-05	33	95	32	99
2006	44	99	29	98

Source: The data are taken from Programme documents and relate to the total persons from farm households trained, i.e. 8,160 in Son La and 8,760 in Ha Giang.

In the event, two of the promoted technologies proved not well-suited to the cultures of the predominant ethnic groups in the selected provinces. The piloted improved external grain store, as noted, was either rejected outright in Ha Giang Province by the predominant Hmong ethnic group or located by them in a field distant from their house, because it was similar in appearance to the construction traditionally used as a resting place for the dead.<sup>40</sup> In Son La Province, the widely promoted SH1-200 small-scale dryer, which uses coal as a fuel and was intended to be moved from household to household, proved not ideally suited to the raised wooden houses of the predominant Thai ethnic groups.

### **6.1.2 Targeting women**

Observation and interviews in the Programme areas confirmed that in the conservative traditional cultures that predominate in the upland areas, women are overloaded with both productive and reproductive activities. Along with most other agricultural activities, women bear the main workload in post-harvest storage, processing and preparing food crops for household consumption. Given this, investment in labour-saving post-harvest technology, such as maize shellers, has the potential to result in the lightening of women's workload. Furthermore, better drying and storage will improve the overall quality and quantity of food stored on farm. The latter, in turn, will tend to result in better nutrition and health for the family. In addition to directly improving the lives of household members, this will tend to further lighten the burden of work borne by each woman in the household by increasing the number of healthy household members. It will

also increase the availability of grain for animal feed, reducing the need for women to engage in the laborious task of gleaning fresh feed and carrying it back to the homestead.

The Team found that in most of the Programme communes visited there had been some attempt to give women priority in PHPN training, although the effectiveness of this varied between communes.<sup>41</sup> Given the subordinate status of women within rural households, it is a laudable achievement that women's participation in farmer training in Son La was as high as one-third in the initial phase and rose to 44% in the sustainability phase.<sup>42</sup> The performance in Ha Giang Province was roughly similar in the initial phase but slipped back in the sustainability phase.

There was an expectation that the Programme's training of men in post-harvest techniques would change the traditional division of labour between the sexes in the household economy towards more involvement of men in post-harvest drying, storing and milling. During our field visits to households that hosted pilot demonstrations the senior male was indeed always presented as "the PHPN person" with the female household members having an overtly minor role. However, the traditional division of labour by gender continues in most such households, with women taking the main responsibility for post-harvest activities including transporting the crop from the field to the house.<sup>43</sup> An exception is the areas of Son La Province where local lorries can reach farmers' fields. In this case, typically the male head of the household sells maize directly from the field.

### **6.1.3 Targeting Poor Households**

Low-income households in the two PHPN provinces are poor by the standards of most least-developed countries and have exceptionally low incomes compared with that of the median household in Vietnam. Poverty in Vietnam's rural upland areas is characterised by households whose livelihoods are based predominantly on a single main crop, have low productivity both per unit of land and labour employed, are isolated due to rugged terrain and poor roads, and have a poor knowledge of crop varieties and husbandry, processing and storage, and sources of input supply. The poor are frequently neglected

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<sup>40</sup> As already noted, it also proved unsuited to the foggy and damp conditions in the main Hmong areas.

<sup>41</sup> For example, in Sa Pat Commune of Yen Chau District, the women's union was said to be actively involved in the farmer extension club. However, the extension session coincided with the day the women's union planted their cotton so that several of the most active members missed the session..

<sup>42</sup> In the mountainous areas where women's participation in formal off-farm activities is usually very low, development projects normally set targets for such participation of around 30%. The Gender Strategy for Agricultural and Rural Development to 2010 sets a target of 50% for women's participation in all MARD training activities in 2010.

<sup>43</sup> According to farmer interviews, trained women could utilise the dryer SH1-200 as well as men, other than for the extra strength needed to move the dryer from place to place.

by local extension staff, who see their role mainly in terms of encouraging the adoption of relatively advanced production methods. In these circumstances, the targeting of the poor requires appropriate working methods (such as participatory rural assessment, village development planning, and interest groups for poor farmers) which allow the very localised specific needs of the poor to be taken into account systematically. A well arranged feedback mechanism is also essential to ensure that the voice of the poor is heard and that their specific needs and difficulties are known and addressed. Unfortunately, such a participatory, bottom-up approach and feedback mechanism was not established as a part of the PHPN.

Poor households can benefit from training in post-harvest practices that involve no financial investment, and some have indeed reportedly benefited from the practices covered by the PHPN training programmes, such as those relating to the correct timing of harvest and to the sorting of cobs prior to on-farm storage. However, these poor farm households have virtually no capacity to invest in the technological packages promoted by the Programme since, as discussed in sub-section 4.5 above, they have no capacity to save and little access to credit.<sup>44</sup>

This fact should have been recognised explicitly during PHPN preparation, and the Programme designed accordingly. It should have focused explicitly either on (a) improved post-harvest techniques that do not involve investment and/or (b) developing and promoting post-harvest technological packages suited to the poorest farm households and tailored to meet the specific requirements of government and donor assistance provided to such households. This would have resulted in a quite different set of technological demonstrations from those actually undertaken, many of which have been located at the houses of leading village personalities who have incomes many times those of the target population. A programme genuinely targeted at adoption by the poor of improved post-harvest technology would have sought to train small groups of poor farm households to manage and share donated or heavily subsidised post-harvest drying equipment and storage.

In the event, the government and donors have begun to donate such equipment, but as already noted in sub-section 4.5 this is being done in the absence of any systematic piloting of institutional arrangements which assure that the equipment is used at full capacity by the poor recipients to maximise its contribution to improving their livelihoods.

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<sup>44</sup> The Social Policy Bank, which provides small amounts of preferential credit targeted at the poor, is probably the only available source of investment finance for poor households.

In both provinces, Programme districts were selected principally on the basis of volume of maize production rather than using poverty criteria.<sup>45</sup> In Son La Province, the Programme was not targeted on the poorest districts: all four Programme districts have poverty rates lower than the provincial average.<sup>46</sup> A likely reason for this is that maize is the province's major cash crop, making the maize-intensive areas of the province the most commercialised.

Data that allows the examination of relative district poverty levels are not readily available for Ha Giang Province. It is possible that, in this province, some or all of the selected districts are indeed amongst the poorest, since maize is grown largely as a subsistence food crop and, consequently, the selection of crops on the basis of the amount of maize produced would not necessarily bias selection in favour of richer districts. Dong Van District, one of the PHPN districts visited by the Team, is indeed exceptionally poor, with many households unable to subsist without external assistance.

This very widespread poverty meant that many farmers who are poor compared with most Vietnamese were indeed trained under the PHPN. However, according to information supplied to the Team by Programme staff and confirmed by farmers, the criteria for the selection of farmers for the training courses were: education and literacy, learning capacity, ability to disseminate to the others, and in many of the communes - position in the village administration (including mass organisation). These do not favour selection of the very poor, who tend to lack all these attributes.<sup>47</sup>

## 6.2 Market Information

Farmers and traders generally have good access to information both through the mass media and informally through their networks of contacts. The PHNP has sensibly not got involved in price forecasting or in the collection and dissemination of daily price information to farmers and traders, since this is costly in terms of finance and human

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<sup>45</sup> Son La Final Report of the Sub-component, 1-2006, Vietnamese version, p.6; Ha Giang Final Report of the Sub-component, 1-2006, Vietnamese version. From our interviews it would appear that the project communes were similarly selected principally on the basis of maize output. There is no readily available data that allows assessment of the impact of this on poverty targeting.

<sup>46</sup> The poverty rates for the project districts are: Mai Son - 36%, Moc Chau - 38%, Thuan Chau and Yen Chau - 43% (Report on Ending Program PPHPN, Son La - 2006, p.6), compared with the mean provincial poverty rate of 46%. (Note that this provincial mean includes the relatively well-off programme districts). (Final Report on Hunger Eradication and the Poverty Reduction Program for Mountainous Ethnic Minority Communities in Son La Province, People's Committee of Son La Province, 2006).

<sup>47</sup> Note that our broad conclusions on the targeting of the poor differ from those of the aide memoire of the 20 April to 5 May 2005 ASPs Sector review, which states, "The PHHC has made good progress and particularly in the Pilot Programme for the North reaches efficiently the primary target group of ASPs. It addresses real needs with a very positive impact on the food security and health for poor small-scale farmers and ethnic minorities".

resources and is well beyond the resources available to the Programme. However, a proportion of farmers in Son La Province reportedly do hold grain speculatively for short periods after harvest and poor farmers in both Programme provinces typically buy grain in the months before the main harvest. Thus, local seasonal price patterns have an impact on the behaviour and welfare of farm households. They should influence advice given to farmers on storage and they are a determinant of the Programme's impact on farm households. Consequently, one would have expected Programme staff at the provincial and district levels to have assembled and analysed time series of local prices, since these can be readily obtained from nearby traders. This was not done, and indeed former senior Programme staff seemed surprised that Assessment Team were interested in seasonal price patterns.

Although the training of farmers and traders touched on quality and marketing issues and provided advice on business management, it was heavily dominated by technological aspects of post-harvest activities. Traders interviewed who had attended the training reported that, although they had benefited from the training in general, they would have preferred greater coverage of business and marketing topics.

## 6.3 Sustainability

The tasks included in the TOR for this impact assessment require that we assess the impact of the Programme on the environment and also assess the sustainability initiatives and the likelihood of long-term institutional commitments. We cover these tasks in this section in the context of a broad review of the programme in terms of the key dimensions of sustainability.<sup>48</sup>

### 6.3.1 The PHPN Sustainability Plan

The Sustainability Plan related to sustainability of the activities instituted during the first phase of the Programme, especially the organisational and financial sustainability of the training activities. The Plan was successful in that it maintained Programme activities for a further year and extended them to a further 40 communes. It also led to a partial transfer of financing to the DARDs in the two provinces, and, with the termination of Danida support for the PHPN district offices, accomplished the first step of a phased absorption of the Programme into the DARDs' administrative structures. This set of outcomes increased the likelihood that the extension systems in Son La and Ha Giang will continue to embody support for post-harvest activities in the years ahead.

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<sup>48</sup> These were first seriously addressed in a development context by the Gro Harlem Brundtland Report of 1976, which argued that sustainability should be defined in terms of economic, environmental and social/organisational sustainability. For an activity to be sustainable it must be in harmony on a long-term basis with its environmental, economic and social context, i.e. its activities should not exceed the carrying capacity of the surroundings within which it is implemented.

### 6.3.2 Environmental sustainability

The PHPN itself does not involve practices or technologies that are likely to have a significantly damaging impact on the environment.<sup>49</sup> In Son La a substantial proportion of maize production takes place on very steep, previously forested tracts that in the past were farmed extensively using low-frequency slash-and-burn cycles. These are now being exploited using intensive, short turnover maize-based farming systems. To the extent that the Programme increases the profitability of maize as a cash crop in Son La, it will tend to exacerbate this environmentally inappropriate use of the province's hilly terrain and lead to increased soil erosion. However, the solution to this is to adopt more appropriate ways of protecting the land, not to penalise farmers by ceasing to improve post-harvest practices.

It should be noted that this environmental issue does not apply to Ha Giang Province to anything like the same extent as in Son La, due both to the nature of the terrain and the economic structure of agriculture. The Province's terrain, particularly in the hilliest districts, is characterised by rocky outcrops. These tend to prevent erosion since much of the arable farming is on small patches of soil between outcrops. Where there are larger areas of land that do not have such natural protection, the provincial government is encouraging the practice of using the large supply of loose stones within fields as terrace walls. This makes widespread erosion much less likely than in Son La Province. The difference in the two provinces' maize economies also means that an increase in the efficiency of maize output as a result of the adoption of improved post-harvest practices will not, of itself, encourage greater growing of maize in Ha Giang Province, especially in the poorer districts. This is because many farms and also the poorer communes and districts are net importers of maize. Consequently, the main impact of post-harvest programmes will be to reduce levels of dependence on purchased and donated maize. This, in turn, will tend at the margin to reduce local prices of the small amounts of grain that farmers sell, thereby decreasing the incentive to expand production.

It is often argued that a large positive environmental impact deriving from improved post-harvest practices for grains is that they lead to a greater domestic availability of foodstuffs and therefore reduce the amount of land that must be devoted to growing food. This in turn reduces the potential for environmental degradation allowing some arable land to be re-afforested. In the case of maize and rice in Vietnam, these arguments do not apply since additions to production substitute for imports in the case of maize and increase amounts exported in the case of rice. Neither will have a noticeable impact on domestic prices and therefore on the amount of the nation's land devoted to the growing of grain.

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<sup>49</sup> There is a small chance in Son La that a rapid increase in the use of flatbed dryers could lead to additional deforestation since firewood in the PHPN provinces tends to be a cheaper fuel source than coal. However, it should be emphasised that the total effect would be likely to be small and that it could only be partly attributed to the PHPN since flatbed drying was practised in the province prior to the Programme.

### **6.3.3 Social sustainability**

Villages in the upland areas tend to be isolated, resulting in a greater interdependence and social cohesion amongst households than found in more accessible areas. Isolation is less than it was due to the recent programme of constructing improved access roads, but it is still significant and should be taken into account in the development of socially suitable models of organising the ownership of post-harvest dryers, storage and local grain trading. This is especially important where a relatively small local output of grain is combined with post-harvest activities for which there are economies of scale, as there are, for example, with grain and cassava flatbed drying. In such circumstances, the most cost-efficient drying solution could well be a single dryer serving the whole village. If this were owned by an individual, he/she would be a monopolist who may not run the dryer in a manner that would maximise the net benefits of the community as a whole. In such circumstances, which would seem to exist in at least some of the Programme communes and villages, possible means of co-ownership and management need to be investigated. It would perhaps have been worth considering this as an option and piloting it specifically during the PHPN so that its social and organisational suitability and financial viability could have been tested and compared with the alternative of large numbers of small-scale, on-farm dryers.

### **6.3.4 Financial and economic sustainability**

The PHPN pilot demonstrations themselves do not incorporate sustainability since, as noted, no provision was made to establish them as viable enterprises run by individual farm households or farmer groups. The Assessment Team found no instance of where the recipient of the donated demonstration equipment viewed the equipment as an investment which at some point would require expenditure on repair and maintenance to keep it operational. This was partly because, in some instances, the equipment was not considered commercially viable, but principally this view stemmed from the fact that the equipment was seen as a one-off windfall that carried no costs or (in the case of dryers) only required recurrent expenditure on fuel and power. In these circumstances, recipients have been prepared to offer the use of the equipment itself for free to other farmers. Households are less likely to be inclined to do so where they have purchased equipment using their savings or a loan.

It would seem of importance that a pilot programme should seek to set-up and establish financially viable activities from the start. Since, this requires piloting activities in real-life situations, it is essential that provisions are made to ensure that involved farm households or enterprises are not exposed to undue risk that stems from piloting new technology. The performance of the pilot activities should be monitored systematically and the data generated analysed both to evaluate the financial and economic viability of the activity and as a basis for providing advice to the persons involved. This information can also be used as a means of establishing simple performance norms that can be used to compensate the operator for undue risk faced due to the experimental nature of the pilot.

## 7. **RECOMMENDATIONS**

Based on the analysis of PHHN and the findings presented earlier the main recommendations from the consultant - with a lessons learned perspective – is as follows:

### 7.1 **Recommendations to Stakeholders**

1. It is essential that all support programmes have a clear, unambiguous statement of their main purpose. Where there is more than one purpose, the set of purposes should be specified explicitly.
2. It is possible that the main purpose of a programme is to serve as a successful experimental pilot that will assist in the design of future, larger programmes. If this is the case, it is important that this purpose be reflected in the logical framework.
3. Inadequately constructed logical frameworks can lead to the omission of key activities in programme design that may prove difficult to correct during implementation. The intervention logic in logical frameworks should be clear, with no steps missing and no confusion of cause and effect.
4. Careful sequencing of programme activities is essential. In particular, it is essential that pilot-based testing of models be carried out prior to using the models as demonstrations, since only suitable models that are technically, financially and economically viable should be promoted.
5. Design, implementation and monitoring and evaluation of a programme is hampered if there is confusion relating to the main problem to be addressed. Where a programme seeks to address a conceptually complex variable, such as post-harvest losses, it is necessary that the dimensions of the variable be investigated fully as a part of the programme design process.
6. The success in implementation of the PHPN training programme shows that it is worth devoting resources to the careful planning of activities prior to programme implementation.

7. Where the aim of pilot demonstrations is to show the commercial and economic viability of technological packages, the demonstrations should be established as commercial activities, records must be kept of physical and financial flows, and these records must be analysed.
8. Where the aim is for a pilot demonstration to serve a set of farm households, potential participating households should be identified prior to supply of the equipment, the means of management of the equipment and of ownership by the group should be formalised, and procedures should be established for sharing costs (including depreciation), benefits, and profits and losses.
9. The appropriateness of particular technologies and their financial and economic viability depend critically on local physical, socio-economic and cultural conditions. Consequently, the nature and degree of variation in such conditions should be investigated to the greatest extent possible during programme design; and local conditions at potential pilot sites should be investigated in detail prior to establishing the testing or demonstrating a particular technology.
10. Small-scale farmers can benefit from improvements in efficiency and increased competition in downstream post-harvest activities in which they are not directly involved. To the extent possible, a programme of post-harvest support that has the objective of benefiting small-scale farmers should intervene at those points in post-harvest processing and marketing chains where this objective can be met in the most cost-effective manner. This, in turn, requires a full evaluation of marketing chains either during programme design or as a first phase of implementation.
11. Monitoring and evaluation are particularly important activities if a programme is designed as a pilot. They should be built systematically into day-to-day programme activities, rather than being confined to periodic surveying and report writing.
12. Monitoring and evaluation should cover not only programme activities but also the outcome of activities.
13. All programmes should have a degree of flexibility during implementation but this is particularly important for pilot programmes. Unsuccessful activities should be stopped, successful activities developed further, and new activities introduced.
14. Where the poor are a programme's main target group, it is important that this is taken into account at each stage of programme design and implementation: farm-level activities and technologies need to be designed specifically to be suitable for the financial capacity, abilities, and type and scale of activities that characterise poor households; criteria for the selection of beneficiaries should explicitly

- include poverty and there should be no criteria which exclude the poor; participatory methods of implementation should be employed that ensure the voices of the poor are heard and that the poor are involved in programme management at the local level; and there should be measurable indicators not only of involvement of the poor in the programme but also of the extent to which they have actually benefited.
15. The key problem for the poor is that they lack resources. Training should take this into account and should focus on changes to practices that do not require new investment. Where investment in new technologies is essential for significant improvements in the welfare of the poor, there must be a comprehensive package of assistance that gives access to these technologies. This needs to be designed into programmes from the start.
  16. To meet the objective of improving the welfare of women, it is important that extension messages are targeted with their interests in mind. In the case of post-harvest loss reduction, messages should focus on the benefits that will be obtained in terms of food quality, the improvement of child nutrition, and the quality of animal feed.

## 7.2 **Recommendations for Post-Harvest Approaches in the new ARD SPS Upland Provinces**

### Introduction

The ARD SPS will run from 2007 to 2012. The draft Provincial Component Description for this support, dated December 2006, provides for coverage of post-harvest activities. Its four sub-components all have relevance for such activities, but the main thrust in this area will be through Sub-component 2: Production, Storage, Processing and Marketing.

The findings and recommendations in sub-section 6.1, above, are relevant to the design and implementation of ARD SPS. Our review of the draft Component Description shows that many of these findings and recommendations are reflected in the revised approach proposed for the component. This applies particularly to the planned bottom-up, participatory approach, the focus on demand driven activities, the provision of village and commune funds targeted at the poor, and the recognition of the importance of marketing chains. Our recommendations for post-harvest approaches within ARD SPS are as follows:

## Recommendations:

We recommend that:

1. A clearer distinction be made than at present between the involvement of farmer groups in training and extension activities and their involvement in commercial activities. The latter requires a much greater degree of planning and management. At some stage in programme development a decision will also need to be made on whether farmer groups involved in post-harvest activities should be encouraged and trained how to bulk their produce prior to sale and divide the proceeds of sale, since this requires another step up in planning and management and also needs a high level of group cohesion. We recommend that the text for outputs 2.1, 2.2, and 2.3 be tightened up in this regard and that the Description contain a firm statement on the envisaged functions of farmers groups,<sup>50</sup>
2. Particular emphasis be placed on ensuring that the improved marketing of products and particularly the branding and labelling of products benefits the target groups, given that many poorer farm households in the selected provinces currently have little or nothing to sell and could be sidelined in any attempt to establish new markets for traditional products;
3. The planned studies on marketing should focus not only on the feasibility of establishing new markets for traditional products but should also cover improvements to the established markets for commodities that are already widely produced;
4. Since the poorest households are net buyers of agricultural commodities, the marketing studies should also examine the channels through which these households acquire commodities and means of improving the efficiency of these channels.

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<sup>50</sup> Outputs 2.1,2.2 and 2.3 contain references to “the introduction of improved practices and models”, “interventions by farmers groups”, “the training of farmer groups in market related subjects and in business development”, “forming cooperation in production and marketing”, “support to local market initiatives for promising agricultural products”, and “support to post-harvest handling including storage facilities and on-farm processing through farmer interest groups, farmer field classes and commune development funds and village development funds”. Elsewhere, there is reference to “the CDF or VDF may support...support for ... improved market access, marketing, etc.”, “This end-of-programme situation will be reached through... enabling target groups to organize their enterprise most profitably”, and “funds will be made available for pilot activities by relevant farmer groups”.