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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

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1. List of Acronyms

AEC	Agricultural Extension Center
ASPS	Agricultural Sector Programme Support
CEW	Communal Extension Worker
CMU	Component Management Unit
CSA	Component Senior Adviser
DARD	Department of Agricultural and Rural Development
DKK	Danish Kroner
EO	Extension Officer
GDP	Gross Domestic Product
GoV	Government of Vietnam
HCMC	Ho Chi Minh City
IPM	Integrated Pest Management
MARD	Ministry of Agriculture and Rural Development
MO	Mass Organisation
MRD	Mekong River Delta
MT	Metric Tons
NCC	National Component Co-coordinator
NGO	Non-governmental organisation
NMU	National Management Unit
NPHS	National Post-Harvest Strategy
PHH	Post-Harvest
PHH	Post-Harvest Handling
PHHC	Post Harvest Handling Component
PPC	Provincial People's Committee
PTA	Provincial Technical Advisor
R&D	Research & Development
RRD	Red River Delta
SCMU	Sub-component Management Unit
SP	Service Provider
SPHHC	Sub-Post Harvest Handling Component
ToT	Training of Trainers
UK	United Kingdom
USD	US Dollars
VBARD	Vietnam Bank of Agriculture and Rural Development Institute of Agriculture, Engineering and Post Harvest Technology
VIAEP	
VND	Vietnamese Dong

2. Introduction

The mission has undertaken field studies in eight provinces and has interviewed staff involved in the project. In each province, members of the team have interviewed:

- i. Farmers
- ii. Local equipment suppliers and manufacturers
- iii. Staff of the VBARD
- iv. Operators of drying facilities
- v. Rice traders
- vi. Rice millers
- vii. Staff of the DARD's and provincial authorities.

During the field work, in the period March 13 – March 21, the mission has split in two sub groups, each touring and interviewing people in four provinces. A list of interviewees and people met and provinces visited by each sub group has been attached in Annexes 4 and 5.

The team consisted of two international and four national members, supported by two interpreters. Their names and specialization are summarized in Annex 9.

3. Executive summary

The mission consisted of two international and four national members, supported by two interpreters. The mission had access to detailed documentation on the history of the project, and spent two weeks travelling in the project area, visiting with stakeholders in eight provinces, and holding discussions with experts in HCMC and Can Tho. The mission presented and discussed preliminary findings at a workshop in Can Tho. The minutes of this meeting are attached.

The report places the experience with the project in the context of developments in the rice industry and the larger economy of the MRD. During the period of project implementation, the region has been subject to a process of rapid development and change, and one general issue raised by this report concerns the need for built-in project flexibility in the face of rapid economic change.

The overall assessment of the team is highly positive with respect to the success in promoting PHH. The team has been impressed by the vigorous implementation of the project, the scale and range of activities, and the knowledge and dedication of the staff employed by the project in the provinces.

Since the start of operation in MRD (May 2001) the Component has provided substantial Post Harvest (PH) training support to nearly 30,000 farmers, 7,000 service providers, 13 cooperatives and 624 extension officers. In addition the component has produced useful training manuals and leaflets on post harvest technology and carried out PH mass media campaigns. The PHH component supported a number of PH research projects related to MRD and the development of a National Post Harvest Strategy. A significant amount of post harvest equipment and machinery has been installed or upgraded. Technical change in the project area has been very much in line with the project's stated output objectives.

The project was less successful in relation to the pursuit of the poverty alleviation development goal. Why this is the assessment and the lessons to be learnt are discussed in the report.

Reasons for success

Given the conclusion that the project had been successful in promoting new PHH technology, the mission attempted to identify the reasons for the success:

- To quite some degree (with respect to the promotion of new PHH technology) the project objectives were clearly formulated and very relevant to the current stage of the development of the rice industry in the MRD, notwithstanding that the actual implementation required a good deal of pragmatic adjustment and the relationship of the output goals to the ultimate poverty alleviation objectives was not clearly specified;
- The organisational model was straightforward, allocating operational responsibility to qualified professional staff recruited to the project in each province, backed up by effective administration in the management unit in Can Tho;

- The project staff had a good knowledge of the key actors in each province supplying services and technology to the sector;
- In most cases, the project seems to have received good support from the DARD and the provincial authorities.

Limited possibilities of quantitative evaluation: The possibility of evaluation based on quantitative estimates is limited for two sorts of reason. The first is the lack of definitive base line data on PHH losses in the target provinces. However, even if such data were available attribution of cause is not possible because the rapid and pervasive change in the rice sector over the period makes it impossible to isolate the quantitative impact of any particular interventions being studied. Thus although it is clear that the technical innovations the project has been promoting have been implemented quite widely, and a reasonable qualitative judgement can be made that project activities made a significant contribution to the observable changes in the industry, it is not possible to attribute to the project a specific quantitative effect.

Indicators and means of verification were neglected in the program design. In the original framework no references were found on how indicators such as ‘.....reduction of quantitative and qualitative post harvest losses.....’ and ‘distribution of benefit...’ should be measured, monitored and verified.

In general monitoring of progress (other than the number trained and dryers in use) within the PHH component was insufficient, although the need was emphasized in annual and semi annual reports a number of times.

A measure of the ‘.....reduction of quantitative and qualitative post harvest losses in the MRD.....’ could have been the quality of the rice at a certain point in the supply chain at certain moments. However, the use of such an output indicator would have required agreed base-line data and an agreed method of measurement in subsequent years.

Need for realism in assessment: Although the project has been very active and has had significant resources at its disposal, it should also be recognised that it is a small part of a very big picture. There is now more than 19 million tons of rice produced annually in the Mekong and the numbers of actors in the industry is huge (e.g. it has been estimated that there are more than 20,000 millers). Any donor funded intervention must therefore be to some degree supplementary to the other forces affecting change. In these conditions, projects can be expected to facilitate and reinforce processes of change rather than claim to be the main driver of progress. Nevertheless the contribution can be useful and justified.

Sustainability: It is too early to judge sustainability after project completion. However, it will certainly be the case that the knowledge spread regarding new PHH technology will have a permanent impact on the stock of knowledge in the MRD. Also there are positive signs that a number of People’s Committees are giving priority to post-harvest activities and making budgetary allocations accordingly.

However, there is some cause for concern regarding who will supply the provincial staff with reliable information on the latest developments on post harvest techniques

and equipment. In the future provincial extension workers still need to be supplied with the latest technical information.

The private sector is of increasing strength, but small and medium size operators will continue to need technical help from government as regards appropriate technology – provision of extension support backed up with a good applied research capacity should become the prime focus of MARD in the future in this and other areas, with agricultural production and service provision being the responsibility of non-government actors.

Summary of Main Lessons Learnt

Lessons for project design:

- In regard to the development goal of alleviating poverty; if an intervention is to directly target and support the poor and other marginalised target groups (i.e. women and ethnic minorities), then there needs to be an in-depth analysis of the situation, needs and potential opportunities of the poor at a very early stage of project design – there is no evidence that was done in this case.
- In promoting innovations, it is important to have a realistic assessment of the economic attractiveness of the innovation to the various participants in the industry – e.g. by and large, the scale of driers is too large and the profit margin too narrow for mechanical drying to be a farm level activity – in practice it has been undertaken by service providers, cooperative groups, traders and millers.
- In a highly dynamic, fast-growing economy it must be recognised that over the life of a project (from initial project identification to completion, i.e. about six years), conditions in the industry are likely to change rapidly, resulting in new needs and possibilities. For example, the rapid growth in off-farm employment opportunities has resulted in labour scarcities in some districts, increasing the demands for labour saving on-farm technology - the need for cutters, combined harvesters, etc. has increased dramatically during the project life-time. Now the demand from farmers is for harvesting equipment rather than driers. Also as the industry has become more sophisticated, and the need for quality has increased, a more sophisticated division of labour has emerged, suggesting the need to increasing attention to the needs of SME's supporting the farming sector (including millers and traders).
- This need for flexibility is likely to be met more effectively in a “demand driven” approach to project design. This is particularly the case if the intention is to target particularly marginal groups, rather than primarily to promote productivity growth. In particular, as noted above, this requires an in-depth situation analysis of the intended target groups at an early stage of project design. Similarly, insofar as the project had the objective of promoting new PHH technology, it was important to identify who the potential actors were and to assess their own changing priorities during project implementation.
- **The general point is that in the design of a project in a sector with the dynamism of the Vietnamese rice industry, there should be built-in flexibility to adjust the project to the evolving needs of the industry.**

Lessons for MARD and the government regarding project implementation:

- The team noted that project staff showed a good degree of pragmatism in gearing project activities to the needs of the actors in the industry.
- The project implementers were well informed regarding the role and needs of the private businesses that now play the leading role as drivers of technical change in the industry.
- One area in which more help is needed is technical support for small-scale machinery workshops, repairing, modifying and manufacturing equipment. Those working in such activities do not find that there is effective help available in terms of technical support for design and other technical issues.

Lessons regarding targeting:

- The condition of the really poor is most affected by developments in the job market – with expansion in off-farm employment providing new income opportunities, and farm mechanisation enabling farmers to pay higher wages.
- Access for ethnic minorities is likely to be dependent on language; this may be an important lesson for new DANIDA projects focussing on ethnic minorities – specific provision may be required to ensure the availability of appropriate linguistic skills.

Lessons for Provincial authorities:

- **When substantial national or donor resources are being allocated to a development activity within a province, the provincial authorities, including the People's Committees and the DARD's should take an active interest at all stages of the project. In this case, this only happened to any considerable degree in the later stages of project implementation.**
- After project completion, local governments, DARDs and AECs, should continue implementing PHT activities. This will require budgetary allocations and a commitment of staff time, on the part of the DARD's and extension service to PHH activities.
- A key requirement for formulating or improving strategies for PHT development in MRD is that the Peoples' Committees and the DARD's should involve people with a wide range of experience in the planning process, including business people from the private sector. The sensitivity of the project to the potential of private sector actors was one reason for the degree of success achieved.
- Provincial advisers who were trained by PHHC and worked efficiently should be assimilated into DARDs, AECs, where they are interested, so that their experience and knowledge can be used -.
- Each province should appoint officers in charge of PHH who should be responsible for updating knowledge on PHH and providing training to CEWs, advice to potential SP and to farmers.

- DARDs should allocate staff to work with activities such as the PHHC so that after project completion, they could have returned to DARD to work on provincial programs

Lessons for the extension service:

- After receiving training, specific steps should be taken to ensure that Extension Officers (EOs) consolidate newly gained knowledge by using newly acquired skills in their work.
- EOs need realistic financial incentives, particularly if they are being asked to implement special programs beyond their normal duties.
- Follow up activities are needed with trainees from Mass Organisations, to encourage them to create interest among their members.
- Manuals are needed on operation and maintenance etc. of PHH machines and on labour safety. These manuals should be integrated into professional training programs for rural youth to help the local authorities deal with the shortage of rural workers.
- Propaganda activities through the mass media are potentially valuable if attractive forms of presentation are used.
- Action is required on storage: Specific guidance should be provided to improve managerial skills, sanitation, export rice quality etc.
- Action is needed to increase the capacity to provide technical support to agricultural machinery

Lessons on research for PHH

- Specialized research organisations such as VIAEP and the MRD Rice Research Institutes should give attention to the improvement in the design of PHH machines (reapers, combine harvesters, collectors and threshers) to meet farmers' demand.
- Further research is required on modifying static driers to reduce fuel and processing time. New research is needed on the design of tower dryers to meet the future demands. Advanced rice dryers, for instance recirculation columnar dryers, should be researched to substitute for the flat-bed dryers as the demand of commercial rice drying grows and to economize on space.
- When applied research is implemented, much more explicit attention should be given to the connection between the research and the needs/perceptions/priorities of those who are expected to implement the research results. For example, technical research always needs to be informed by an understanding of the specific economic constraints facing the sector, and the economic viability of any proposed innovations.

4. Brief description of history and activities of the project component

4.1. Background

Post Harvest Handling (PHH) is one of the six components of the Danida-funded (DKK 450 million) Agricultural Sector Programme Support (ASPS). The other components are Seed, Integrated Pest Management (IPM), Small Livestock, Research, Credit, and Capacity Building.

The PHH Component comes under the Ministry of Agriculture and Rural Development (MARD), while the Credit Component is within the Vietnam Bank for Agriculture and Rural Development (VBARD).

The Credit Component was designed to support the other components, including the PHH by offering credit and household financial training to targeted farmers and service providers and by offering softer conditions on (VBARD's) requirements for collateral in return through use of a Loan Guarantee Fund (50% ASPS and 50% VBARD risks sharing on defaults). Interest and repayment conditions are the same as normal commercial banks.

The Government Agreement of ASPS was signed in August 2000, and the first Danida Post Harvest Adviser started his assignment in May 2001. The current ASPS Phase (I) terminates on 30 June 2007 and will be followed by a 2nd Generation ARD - SPS with a strong focus on rural livelihood improvements in five upland provinces not included in the existing programme.

None of the existing ASPS components or provinces, however, will continue in the ARD-SPS. This study on impacts and lessons learned of the existing interventions, however, aims to be of value to the MARD, provinces and other stakeholders in the provinces in the existing programme, in their future post harvest, as well as of interest for the implementation of programs in the five new provinces.

The development objective of the Agricultural Sector Programme Support (ASPS) is "*Reduction of rural poverty based on sustainable agricultural development*" and the immediate objective is "*Sustainable growth in productivity and farm household income, from quantitative and qualitative improvements in agricultural production and marketing, with special focus on the poor, the women and the ethnic minorities*" - which is also the development objective of the PHH Component.

The immediate objectives of the PHH Component are: (i) *Improved access of farm households to low-cost threshing, drying and storage services*; and (ii) *Improved management by individual farm households of threshing¹, drying and storage operations*.

Overall coordination of the programme is the responsibility of a National Management Unit (NMU) based in MARD and individual components are managed by Component Management Units (CMUs).

¹ Including cutting

The CMU of Post Harvest Handling Component is located at the Institute of Agriculture, Engineering and Post Harvest Technology (VIAEP), with implementation responsibilities delegated to the Sub-office (SCMU) in Mekong River Delta (MRD), Can Tho City. The Post Harvest Component has seven supported outputs: Post Harvest Strategy (1), General Capacity Building (2), Research and Institutional Support (3 & 4), Support to 13 Mekong River Delta Provinces (5 & 6) and a Post Harvest Programme for the North (output 7).

The TOR for this study states that the “emphasis has been on drying and less on cutting, threshing and milling”, although documentation suggests that in practice emphasis (e.g. credit focus) has shifted away from drying in the later years of the project implementation. The TOR also state that “main beneficiaries are the farmers, the service providers (mainly the bigger drying, threshing and milling operators) and to less extent the extension officers (though lately sharply increased) and the manufactures”.

4.2. Project identification and design

At the time the project was initiated, Vietnam’s crop production was estimated to account for some 18% of GDP and 20% of export earnings. The project document noted that post-harvest losses were estimated to be in the range of 13-16 %, corresponding to a GDP-loss of 1-2 % per year and that the Mekong River Delta (MRD), being the main rice surplus and export zone, had significant losses as harvesting often took place under extremely wet conditions.

Post harvest losses were seen as both quantitative and qualitative. The general low quality of rice exports resulted in a loss of farmer income and export earnings.

In preparing the project, it was noted that only negligible public resources were invested in developing post-harvest research and extension to improve post-harvest operations at village and household level. At national level, i.e. within MARD, post-harvest issues at village and household level had no clear institutional anchoring. At provincial and district level, the system of extension services introduced in 1993 was seen as new and weak, without the capacity to deal with these issues.

The Danida-assisted “Post Harvest and Rice Processing Development Project”, 1997-2002 had covered three provinces, Thai Binh in the North, and Can Tho and Soc Trang in the MRD, and supported the promotion of flat-bed dryers, research and extension, and investments in modern rice processing plants.

4.3. Focus and Strategy

The intention was that the project should focus of the promotion of new PHH technology.

Following disappointing experiences with large-scale assistance to state enterprises engaged in post- harvest operations, Danida had decided to concentrate future support on improving post-harvest operations at village and household level. The PHH was therefore designed to do this, with support emphasising the main food crops, i.e. rice, maize and legumes, and the threshing, drying and storage operations related to these crops.

A two-pronged strategy was proposed to reduce losses at household and village level. First, in some situations the best available option, in terms of cost-effectiveness, is medium scale post-harvest technologies, such as the 4-8 ton per batch dryer. However, it was recognised that the investment in such technology would be beyond the capacity of a poor or low-income individual household, even if facilitated with credit. Nevertheless, it was also noted that low-income households would greatly benefit from having easy access to these services at a low price, and therefore the strategy would be to support and promote a large number of viable investments in such services and in this way increase the supply and promote competition among service providers.

Investors would primarily be better-off households, but special efforts would be made to promote co-operatives and farmers' groups as owners and operators of such facilities, which could be the starting point for expanding into other value-added activities. However, the key poverty issue in this context was to avoid local monopoly situations so as to ensure a fair distribution between the service provider and the service user of the value-added generated by the operation.

In some situations, low-cost methods and technologies, appropriate for management by an individual low-income household, were thought to be cost-effective in terms of reducing post-harvest losses. The adoption of such technologies required very little investment, but mainly knowledge and skills. However, the transfer of such knowledge and skills was constrained by the weak capacity of the extension services. In the foreseeable future it was seen to be unlikely that the service would have such capacity. The strategy, therefore, would be to use low-cost methods of transfer, such as mass media, and limited low-cost training.

Generally, women in the Vietnamese farm household play a remarkably strong role in product marketing, post harvest operations and household cash management. Therefore, it was intended that special measures would be applied to ensure that women would benefit from the training and credit support for promoting medium-scale technology, and from the support for development and transfer of low-cost methods to households.

It was also concluded that Post-harvest research, both in the public and the private sectors, needed to be strengthened to deliver more cost-effective methods and technologies for transfer to villages and households.

4.4. Provincial Support for the Mekong River Delta

Provincial support for the Mekong River Delta (MRD) comprised two sub-components:

- Improved supply of post-harvest services in the MRD (output 5) and
- Improved household management of post-harvest operations in the MRD (output 6).

The sub-components would in particular focus on improving the drying of paddy.

The Support for Improved Supply of Post-Harvest Services had as its strategic target the installation of about 7,000 new operators of medium scale flat-bed batch dryers

(4-8 ton per batch) in 9 or 10 provinces in the MRD. Some of the new operators should be co-operatives or farmers' groups. When established, the 7,000 operators would handle about 30% of the harvest. The support under this sub-component was to comprise of technical assistance and training, while the credit component (a separate component of the ASPS) would facilitate investors' access to medium-term credit (3-4 years) for the financing of dryers. The technical assistance and training would target new investors in drying operations as well as local blacksmiths and equipment manufacturers who would play the important functions of manufacturing and servicing drying equipment.

Danida provided the budget for contracting mobile training teams to provide professional and intensive training of operators in technical and managerial aspects of the operation. In addition, national technical and managerial advisers were to be assigned to the provinces to do promotion, in particular of cooperatives, and provide advice to the new operators during the start-up phase.

The Support for Improved Household Management of Post-Harvest Operations would focus on transferring low-cost methods and technologies, appropriate for management by an individual low-income household through low-cost mass media campaigns, tool kits for district extension staff to train communal extension workers and support from the national advisers assigned to the provinces.

Other components of the ASPS could be expected to support the PHH. Specifically, the Credit Component facilitated the purchase of PHH machinery. Also, the interventions to support on farm productivity through improved seeds and pest management were other interventions aiming to support increases in the incomes of farm households, while the research and capacity building components would improve the capacity of MARD to support future developments in PHH> .

4.5. Component Management and Budget

The Department of Science, Technology and Product Quality (DSTPQ) of MARD was identified as the executing agency, and a Component Management Unit (CMU) was established within DSPTQ. MARD appointed a National Component Co-ordinator who was advised by a Danida Component Senior Adviser (CSA) responsible i.a. for the proper utilisation of Danida's contribution. Other MARD units were expected to play a key role in the implementation, notably the Department of Agricultural and Forestry Extension and the Post Harvest Technology Institute. At provincial level, the Component was expected to work with the provincial Departments of Agriculture and Rural Development (DARDs) and in the MRD, a sub-component management unit (SCMU) was to be established to manage the implementation of the MRD sub-components, under the direction of the CMU.

Risks and Assumptions were identified as follows.

Post-harvest handling at village and household level had so far had low priority in terms of government's allocation of human and financial resources. National and provincial governments faced a tight budget constraint and it is uncertain if they in the short-term would be able to allocate significantly more resources for this field. This was seen as a major risk, and the component design attempted to reduce this risk by

providing budget for contracting of expertise. However, this would not ensure the long-term financial sustainability of the activities, but hopefully it would convince national and provincial governments that it is worth while to allocate more resources to improve post-harvest handling at household and village level.

The other main assumption related to the demand for investing in improved post-harvest methods and technologies which would be determined by numerous factors, including:

- The ability of research to develop cost-effective methods and technologies.
- The structure of the market and prices, in particular with respect to rewarding good quality produce.
- The financial markets and the cost of credit, which in turn would be determined by macroeconomic policies and developments

None of these assumptions were seen as requiring pre-conditions to be fulfilled before the approval of the Component. However, when it came to the specific support for provinces and districts it would be a pre-condition that they assign one officer (part- or full-time) with responsibility for post-harvest handling at household and village level.

Budget: A summary of the original PHH component budget is provided below. The total required Danida contribution was estimated at USD 5.2 million or DKK 36.6 million, including contingencies. The main part of the budget was for technical assistance (40%) and training (35%) while investments and equipment only accounted for 2%, since the credit component would facilitate the investments in the post-harvest equipment.

Post-Harvest Component Budget for Danida's Contribution '000 USD

	Technical Assistance	Training	Equipment Investment	Recurrent Operation	Total
1. National Post-Harvest Strategy	260,0	40,0		31,0	331,0
2. Capacity Building in MARD	200,0	270,0	30,0		500,0
3 & 4. Post-Harvest Research & cap. building	130,0	350,0		16,0	496,0
5. Improved PH Service Delivery in MRD	755,4	425,0		230,2	1.410,6
6. Improved Household PH-Management MRD	48,0	55,0		200,0	303,0
7. Strategy for the North	266,0	690,0		34,0	990,0
8. Component Management	478,0	40,0	74,0	210,0	802,0
Sub-total	2.137,4	1.870,0	104,0	721,2	4.832,6
Contingencies (10%)					400,0
GRAND TOTAL					5.232,6

As can be seen from the table, funds allocated to the Mekong Region sub-component totalled some US\$1.7 million, about one third of the PHH total. Of course, some of

the national level expenditures (e.g. capacity building and research) could also be expected to benefit the MRD.

Budget out-turn

PHHC Financial key data and status at 1st March 2007 (DKK * 1000)			
Budget item	Original Grant * (DKK)	Budget spent Mar 01- Mar 07 (DKK)	% spent
Component Management	5.964	5.737	96%
Output 1. National Post Harvest Strategy	2.317	1.647	71%
Output 2. Capacity Building in MARD	3.500	2.484	71%
Output 3 & 4 Post Harvest R & D	3.472	1.947	56%
Output 5. Supply of PH Services MRD	9.874	8.322	84%
Output 6. Imp. Household Management of PH	2.121	1.649	78%
<i>Output 7. Post Harvest Programme in the North</i>	<i>6.580</i>	<i>5.552</i>	<i>84%</i>
Contingencies	2.800		
Exchange rate difference		525	
Total	36.628	27.863	76%
1 US\$ = 5,58 DKK (March 27, 2007)			
* excluding cost of component adviser			
Utilisation of funds as per Jan 07:			
73 % of the budget for international and regional TA			
83 % of the budget for national TA			

4.6. Assessment of project design

From the point of view of DANIDA's development objective of poverty alleviation the project was inadequately designed. How the anticipated achievement by the projects of improving PHH would impact on the poor, women and ethnic minorities was not convincingly spelt out.

However, as an intervention aiming to promote improved PHH as such, the component was well designed and the planned timing of the activities, under output 5 and 6, according to the original schedule was excellent, in the sense that promoting changes in PHH matched the needs of the sector in the period the project was to be implemented. However, execution did not match design intentions in some critical respects. As a result, the component was extended twice and the supporting outputs (Research and Strategy) were significantly delayed as compared to initial design.

The training approach proposed was rather complex and ambitious but turned out to be broadly successful. An impressive number of farmers, service providers, dryer operators and vice chairmen of District People Communes were trained. The training approach itself will be discussed in more detail in chapter 7.

Decentralisation of implementation management to an office in Can Tho proved to be an effective management approach, ensuring effective coordination of the project in the MRD.

One weakness in program design relates to indicators and their verification. It was stated a number of times in the PPHC project documents that indicators still had to be developed for sub components 1 – 4. However this has not happened according to the information that was available to the mission. In addition to the indicators one should also be clear and specific about the means of verification. In the original framework no references were found on how indicators such as ‘.....reduction of quantitative and qualitative post harvest losses.....’ and ‘distribution of benefit...’ should be measured, monitored and verified.

Indicators and means of verification should have had a direct link with to component objectives. In general monitoring of progress (other than the number trained and dryers in use) within the PHH component was insufficient, although the need was emphasized in annual and semi annual reports a number of times.

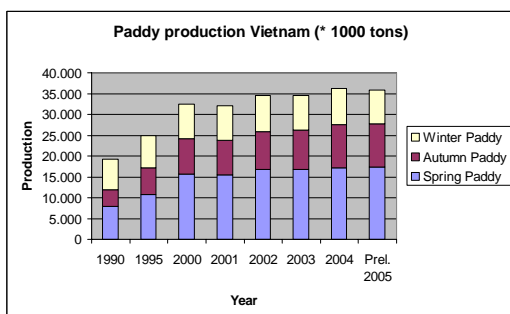
A measure of the ‘.....reduction of quantitative and qualitative post harvest losses in the MRD.....’ could have been the quality of the rice at a certain point in the supply chain at certain moments. However, the use of such an output indicator would have required agreed base-line data and an agreed method of measurement in subsequent years.

5. The context: developments in rice industry

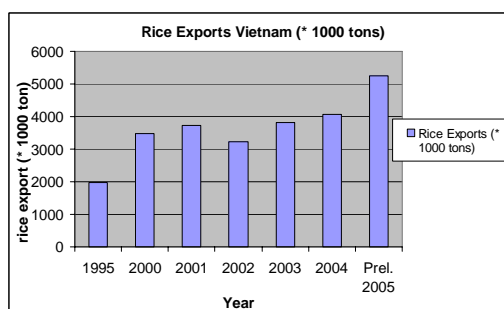
5.1. Expansion in rice production and role in the economy

Over the decade of the 1990's, Vietnamese rice production went through a period of sustained output growth. This expansion in production was a crucial component in Vietnam's overall economic success. In the previous decade, Vietnam had been faced with a severe crisis in food supply; the rapid expansion in the main food staple ensured food security and contributed to Vietnam's export earnings.

Production of paddy Vietnam (* 1000 tons)



Rice Exports Vietnam (* 1000 tons)



Vietnam rice and total exports value (Million US dollars; calendar year)

Year	1987	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total Exports Value (FOB)	854	7255	9185	9360	11541	14482	15029	16706	20149	26504
Rice Exports (FOB)	17	854	870	1020	1025	668	624	726	720	950
% of total exports	2%	12%	9%	11%	9%	5%	4%	4%	4%	4%

Source: General Statistical Office



Source: Asian Development Bank (ADB)
www.adb.org/statistics

Production of cereals by province (thousand tons)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Prel. 2005
WHOLE COUNTRY	26140.9	27933.2	29174.5	30757.5	33146.9	34538.9	34272.9	36960.7	37706.9	39581.0	39548.8
Red River Delta	5339.8	5651.8	5987.4	6285.8	6703.4	6867.9	6648.1	6999.0	6789.0	7053.6	6533.8
North East	1700.8	1885.9	2060.6	2117.9	2294.5	2491.4	2712.3	2877.3	3039.0	3118.5	3193.3
North West	425.2	429.0	464.0	477.7	541.8	631.4	696.1	768.6	824.5	932.6	947.5
North Central Coast	2255.8	2187.8	2674.0	2498.0	2862.6	3051.7	3220.5	3436.7	3581.1	3895.6	3684.4
South Central Coast	1446.3	1603.9	1623.3	1603.7	1744.9	1753.2	1799.3	1813.0	2004.3	2027.7	1921.7
Central Highlands	542.4	597.1	697.5	653.4	739.8	907.1	1009.7	1113.8	1532.8	1531.2	1661.0
South East	1514.9	1668.4	1762.4	1748.3	1917.1	2081.5	2093.9	2130.7	2258.2	2282.3	2182.8
Mekong River Delta	12915.7	13909.3	13905.3	15372.7	16342.8	16754.7	16093.0	17821.6	17678.0	18739.5	19424.3
Long An	1016.2	1181.8	1243.1	1401.2	1523.8	1574.6	1635.1	1743.8	1783.6	1912.7	1948.8
Tiền Giang	1194.8	1231.7	1325.1	1326.1	1307.7	1307.5	1293.2	1293.6	1276.6	1325.0	1314.1
Bến Tre	322.4	355.8	321.6	340.9	328.9	359.5	382.8	395.5	383.6	370.9	344.3
Trà Vinh	648.8	679.7	720.1	749.8	844.3	952.4	911.9	1018.5	1067.0	1055.1	1052.0
Vĩnh Long	862.6	886.3	874.8	970.7	967.3	942.2	912.5	965.3	938.2	965.1	976.9
Đồng Tháp	1624.4	1733.5	1757.2	1939.0	2088.3	1889.0	1975.9	2196.7	2239.0	2450.3	2632.8
An Giang	1950.3	2027.7	1998.4	2061.6	2109.7	2188.2	2154.9	2639.2	2748.8	3079.2	3204.1
Kiên Giang	1462.4	1697.6	1692.2	1900.4	2026.2	2284.3	2188.0	2578.4	2490.0	2740.0	2944.3
Cần Thơ	1714.1	1806.7	1718.3	1898.6	1982.7	1886.4	1957.7	2222.4	2152.0	1198.0	1237.7
Hậu Giang										1086.8	1117.0
Sóc Trăng	1092.9	1156.2	1186.5	1388.4	1513.9	1624.7	1534.1	1650.5	1615.8	1535.0	1643.7
Bạc Liêu	494.7	555.1	518.0	677.9	805.4	894.3	727.6	695.3	629.0	616.7	656.2
Cà Mau	532.1	597.2	550.0	718.1	844.6	851.6	419.3	422.4	354.4	404.7	352.4

Source: General Statistical Office

5.2. Evolving structure of the industry in the MRD – roles of farmers, cooperatives, service providers, traders, State agencies.

While the MRD has experienced successful economic growth over the past two decades, in certain respects (educational attainment; availability of skilled workers, development of rural crafts) the region lagged behind the Red River Delta. Also, although the two deltas are relatively prosperous parts of the country, with a lower proportion of poor than in the rural areas in the central coastal region and the northern highlands, given the large population of the MRD, the absolute number of poor is still considerable.

The expansion in production was in direct response to Doi Moi (economic renovation), which had begun from 1985 with the shift to household production, followed by a steady process of liberalisation of prices and internal trade. In the MRD, production cooperatives had not been so developed as in the Red River Delta, and they rapidly declined.

Decentralised market incentives, combined with access to improved seeds, resulted in the dramatic increase in output. It also resulted in a considerable change in the institutions operating in the sector. Increasingly trading shifted from state enterprises to private firms, and small and medium size firms emerged to provide farmers with services. The supply chains which have emerged are described in the next section (5.3).

There are now thousands of private millers, serviced by an even larger number of rice traders, plus providers of drying services and harvesting equipment. There is also a large number of small-scale machinery workshops, along with larger scale producers of equipment, including an equitised state manufacturer.

Cooperatives, which had been used mainly as a tool for State management of agriculture in the MRD in the period 1975-85, rapidly declined with the liberalisation of production. In recent years there has been some revival in cooperative activity, but it is a quite minor part of the rice industry in the MRD. The cooperatives visited by the Mission were quite small (30-100 members) and mainly brought together better-off farmers (who could afford to buy shares).

The original stated objective of establishing some 200 cooperatives. It was understood by the mission that at the latter stage of the component the target was reduced to 13 coops. However it was observed that coops that successfully operate drying facilities operate essentially as Joint Stock companies. In fact there is no principal difference between this and other modes of providing drying and post harvest services to individual farmers.

The new forms of economic organisation mean that public interventions in agriculture have to be cognisant of the new actors in the industry and the new division of labour which prevails,

During the period of project implementation, there has been a further process of change underway:

1. There has been a shift in emphasis from growth in quantity of output, to improvements in quality and value, particularly for the export trade. In the early years of export growth, the quality of Vietnamese rice exports was low, with the main regional competitor, Thailand, enjoying a significant price premium. With improvements in quality, Vietnam has been able to steadily reduce the price gap. This has meant that the improvement in drying practices has been relevant as much for its impact on quality as for its contribution to the reduction in quantitative losses.
2. There has been an increasing complexity in the division of labour within the industry, with a range of service providers, traders and machinery producers serving the industry. The resulting structure of the industry and its implications for the design of public interventions to support PHH are discussed in detail below.
3. Field observations indicated that in the last few years labour has been getting scarcer and more expensive. The development of new off-farm employment opportunities has resulted both in a decline in labour availability within the household, as family members have sought out new job opportunities, and increasing scarcity of labour seeking farm employment.

This change is evidenced in available data on labour utilisation:

Proportion of working time used by workers of working age in rural areas by region										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	Prel. 2005
Whole Country	72.28	73.14	71.13	73.56	74.16	74.26	75.42	77.65	79.10	80.65
Mekong River Delta	68.35	71.56	71.40	73.16	73.18	73.38	76.53	78.27	78.37	80.00

Source: General Statistical Office

A decade ago, the utilization of labour time in the MRD was below the national average and indicated the ready availability of rural labour. In the past decade, the utilization of labour has steadily increased. As a result, the interest of farmers has been increasingly focussed on labour saving equipment at peak production times (notably for harvesting). An average labour utilization of 80% over the season must imply very high rates of utilization during peak seasons – oribably something like full employment.

What can be observed is a process underway which could be described as a new rural transition in the MRD to a more sophisticated, complex production system, with higher levels of mechanisation economizing on labour use in the peak. The PHH component has contributed to these developments by training a group of skilled and specialist service providers and farmers. The PHH component has contributed to the emergence of much needed specialists within the rice supply chains.

The timing of the PHH component in relation to this process of change was excellent. With its support of the introduction of drying and threshing equipment as well as row cutters and combine harvesters the programme has accelerated the process of change.

5.3. Developments in rice supply chains

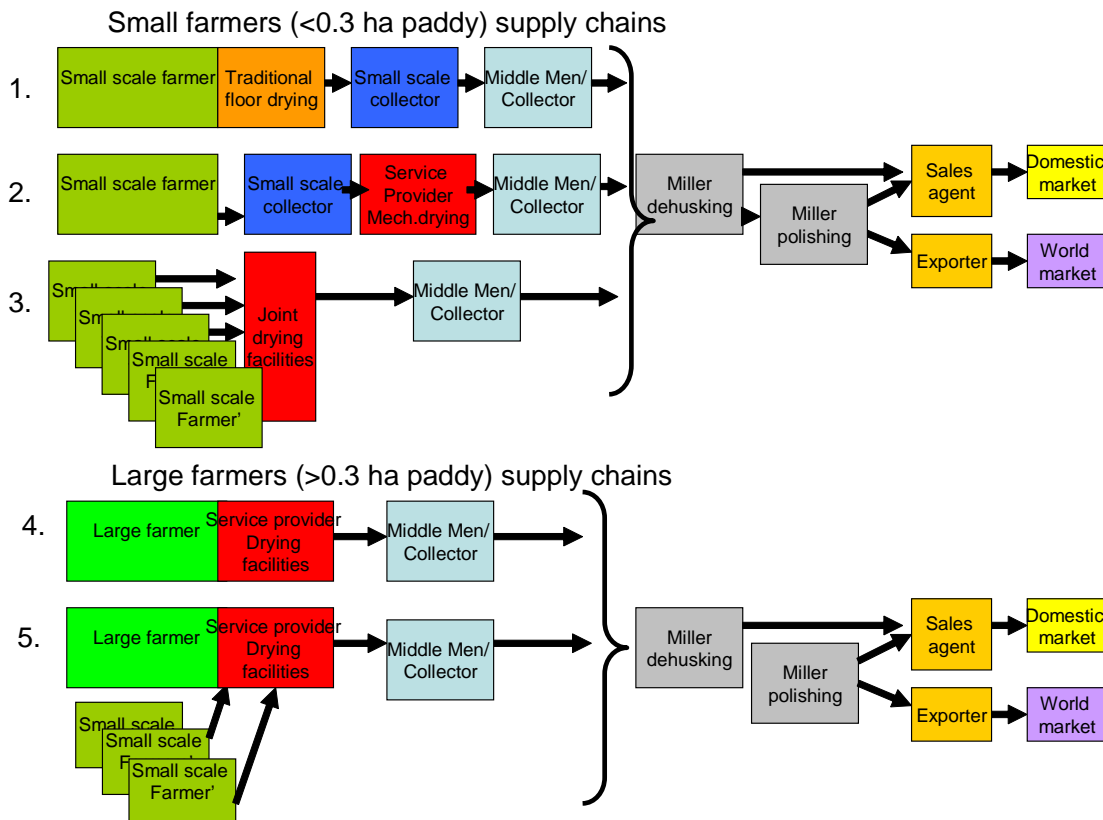
A number of specialised functions and roles are described in the research report of Anh et al (2006). In general supply chain integration is limited; many actors specialise in one specific role, although some traders have extended their activities into drying, as have many millers.

Service providers are usually recruited from the better off farmers who have land and capital to invest and often play a leading role in the local community. Service providers typically install a 6 MT or higher capacity flat bed dryer.

Small farmers cannot operate their own drying facilities; not even a 2 ton flat bed dryer. The investment costs and the cost of drying per kg are too high. For mechanical drying of rice, small farmers send their rice to a service provider offering drying facilities.

Another option is for farmers to join with neighbouring farmers to operate a cooperative dryer.

The introduction of specialized service providers in rice supply chains is a sound development. It is essential that small farmers who need drying services have a choice of competing service providers. Millers are likely to pay a higher price for improved quality and as a result Vietnam will enhance its competitive position at domestic and export markets. Some of the various supply chain configurations which were discussed during the missions' field work are schematically depicted below.



6. Organisation of the sub-component

6.1. Targeting of PHHC

The immediate objectives of the PHH Component were: (i) Improved access of farm households to low-cost threshing, drying and storage services; and (ii) Improved management by individual farm households of threshing², drying and storage operations, while the ASSP has a “special focus on the poor, the women and the ethnic minorities”.

One difficult area in assessing impact of the PHH in the MRD is how far did the component affect farm households as such, and the particular groups that were the ASSP focus. It was evident from the design stage of the component that to have a serious impact the primary target group of the PHH component should be service providers. Simply put, poor households were not going to be the leading innovators in PHH. Small farm size and limited financial resources meant that poor households were not in a position to purchase and use equipment. It might have been hoped that poor households could join together in cooperative – hence the attention given to cooperatives in the project design. However, there is no evidence the cooperative members are typically the poor, as membership requires a financial commitment. If it is hoped that farmers’ groups involving the poor could be a vehicle for poverty alleviation, then a good deal of work would be required to design appropriate models, given the lacks of assets of poor households.

The original stated objective of establishing some 200 cooperatives. It was understood by the mission that at the latter stage of the component the target was reduced to 13 coops. However it was observed that coops that successfully operate drying facilities operate essentially as Joint Stock companies. In fact there is no principal difference between this and other modes of providing drying and post harvest services to individual farmers.

It could be expected that the poorer households would benefit from improved availability of services and from general increases in household incomes in the MRD, and that has been the case. In practice, poor households with limited stocks of assets will benefit in particular from any improvement in labour markets. The increase in labour utilization and the cost of labour in the MRD mainly benefits poorer households.

Thus the immediate impact of the project has been on service providers, as was intended in the project design. More than 7000 service providers have been trained and almost 3000 of them have installed new drying equipment.

Of course, the degree to which the observed expansion of dryers can be attributed to project activities as such is difficult to judge. From interviews it appeared that a number of the SP’s who eventually bought a new dryer already had plans to do so before they started the training course. Obviously it made good sense for the project to provide training to those who were on the verge of adopting the new technology. The

² Including cutting

training course provided independent and convincing information on drying technology and equipment, which confirmed these actors in their decision to purchase.

The poor in MRD typically do not have land or only have a very small holding. They often belong to ethnic minority groups such as Khmer, or Cham and live in isolated areas. In the first stage of PHH (2001-2004), there were no special PHH activities for the 'poor'. Short PHH training course for members of so-called 135 villages were only organized under the PHH Sustainability Plan (executed in 2005 and 2006).

Under the sustainability plan, more emphasis was put into including the marginal target groups. About 24 % of all participants who attended a training programme under output 6 were from a minority group. Some of these training courses (0.5 day only) were even organized at the Khmer temples and the PHH developed special training curriculum for ethnic minorities as most of them have a lower level of education, and some of them are even illiterate. The curriculum and training materials in the Khmer language has been kept simple. One issue the team raised was that it could have been more effective to employ one or two Khmer (PTA) project staff for those provinces with a large population of farmers from minority groups. Explicit provision for that could have been made in the project.

Necessarily, the mission's appreciation of the condition of the poor was based on fragmentary evidence and observations. It seems that despite their economic marginalization, many poorer households are participating in the process of rapid economic change in the MRD. Some of them have rented out their land to larger, neighbouring farmers and found themselves a job in off-farm employment, including benefiting from the extra employment generated elsewhere in the rice supply chain. Other small farmers continued to grow rice and in some case benefit from the availability of drying facilities in their neighbourhoods to sell their wet rice at reasonable prices.

Lessons may be learned from this project about ways to impact on poverty. It is not evident in relation to this project that efforts to engage with the poor more directly would have had much impact on the livelihoods of poor households. Having chosen to focus of a specific sort of technical change which was inherently not likely to be achieved through the agency of poor households, on the one hand if the main thrust of implementation activities had been to target poor households, the technical change/output increase objectives would almost certainly not have been met. On the other hand poor households would have derived little benefit.

The lesson for the design of poverty projects is clear. If one wishes to be successful in directly impacting on poor households, to choose a particular type of intervention and then to try to use that intervention to target the poor is to get the proceedings the wrong way round. If the aim is to directly impact particular income groups, the first step has to be to understand the situation, needs and potential of the target group and then to design a project to meet those needs and take advantage of that potential.

Nevertheless the likelihood is that the process of development and change the project supported indirectly benefited the poor, particularly by the impact of economic change on job opportunities and the labour market.³

This is not to argue for a “trickle down” approach, but to recognise that change in a dynamic economy is likely to open up quite new income opportunities for the poor and may even involve their physical re-location in the pursuit of new forms of livelihood.

Another important ASPS target category was women, who were mainly addressed specifically in the latter part of the component programme. Special training classes were organized for members of so called mass organisations (women and youth associations) and all women who had the potential to become a service provider or who already owned drying facilities were nominated for training courses.

Women, who fully participate in household production activities, benefit from increases in household output and from reduction in labour burden as a result of introduction of labour saving equipment. The introduction of labour saving equipment, for example, is likely to reduce the heavy burden of female physical labour.

The mission had no basis for judging the intra-household division of benefits. The mission did, however, note that a number of prosperous service providers (traders, millers) interviewed were women.

The overall judgement of the mission is that any greater emphasis on poorer households would not have made much sense. A PHH activity is not an appropriate instrument for directly supporting poor farm households.

6.2. Structural change and targeting

The component design recognised that the rice industry was going through a process of change, resulting in a new division of labour and new actors in the industry. However, the speed of change in the last two to three years has been faster than expected, particularly in relation to the wish of farmers for access to harvesting equipment and the rapid growth in medium size millers and local workshops supplying equipment.

More flexibility could have been allowed in the programme to respond effectively to these rapidly changing circumstances. For example, although some mention was made of machinery workshops in the project plans, producers of drying and other equipment and millers were not among the target groups. The mission was however assured that

³ This point was challenged in a comment on an earlier draft of the report with the argument that surely mechanization by displacing labour will erode the incomes of the poor. Of course, what is happening in practice could only be established by empirical study beyond what is possible in the scope of this report. True, there have been many instances where technical progress have displaced groups of workers, to their cost, from the hand-loom weavers in the British Industrial Revolution to numerous other instances – however in all these cases the loss of particular jobs was associated by a general increase in productivity which allowed for rising living standards. In this case labour saving technical change is being introduced in response to increasing scarcity of labour and rising labour costs, and it is by using machinery that higher wages can be accommodated and workers continue to be employed at the higher wage levels. Technical change also allows poor workers to acquire new skill in PHH activities – this is of crucial important to those whose only means of sustenance is the sale of their labour.

although producers of fans and flat bed dryers were not officially included, they were informally provided with technical support and advice from PTA's, AEC and DARD staff.

After the initial rapid installation of dryers, from 2004 the demand for dryers slowed. From that moment a more flexible approach was needed, targeting other groups and other technologies.

Farmers groups: The report on the Farmers' Field School (FFS) and Farmer's Group (FG) approach (2007) is very positive about the FFS and FG in most other components such as in the Integrated Pest Management and Small Livestock component of the ASPS programme but raised critical questions about the neglect of a farmers' group approach in the PHH component.

The mission visited a small number of farmers' groups, cooperatives and farmers' clubs who successfully operated one or more dryers and other (post) harvest services on behalf of their members. These tended to be quite small groups of better off farmers, who took up equity in the group venture both to derive a profit from the hiring out of equipment purchased and to receive preferential access to machinery use on their farms. However, the mission was unable to gauge how pervasive these groups were throughout the MRD; although our impression was that their coverage was quite limited. It is difficult to judge whether the component could have been more use of existing farmers' groups as a starting point or platform for training and other activities.

There does not seem to be much of a case in principle for favouring farmers' group as a possible vehicle for service provision over other modes of supply. Where groups of farmers come together to purchase equipment they should of course receive help, but it would be a mistake to believe that will be a general model for service provision.

For farmers groups to act as a vehicle for the collective involvement of the poor in new technologies would require the design of a model that can work, given the lack of assets of small farmers. At the moment, group initiatives do not seem to be based on the poor, and it would be a mistake to commit resources to such initiatives until they have been carefully designed and proved in operations on the ground.

7. PHHC ACTIVITIES

7.1. Training

The PHHC's training activities aimed to:

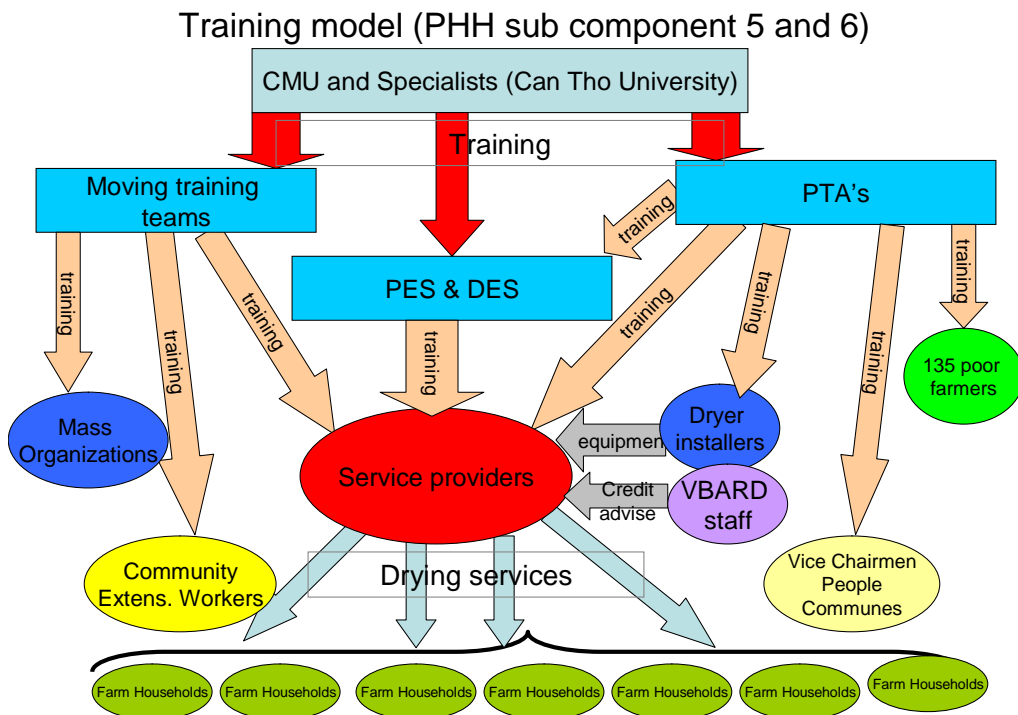
- Increase the number of driers and drying capacity in the MRD;
- Encourage farmers to make use of mechanical driers.

In the pursuit of these aims, PHHC organized training for different target groups such as:

- Potential Service Providers: those having resources and motivation to invest. This was the main focus of the training programme;
- Mass organisations : Woman Union, Farmer Association, Youth Union;
- VBARD Bank (credit) staff;
- Rice producers: including poor farmers and ethnic minorities;
- Dryer manufacturers;
- Vice chairmen of People's Communes

7.1.1. Training organisation

The complex training organisation which was set up is schematically presented below:



Through this training model all target categories were exposed to technologies and best PH practices directly through a mixture of demonstrations, class room training, personal consultation and mass media campaigns. They were also indirectly exposed through their neighbours, service providers and commune extension workers. The backbone of the training programme was the mobile training groups consisting of three persons with differing backgrounds and the Provincial Technical Advisors (PTA's). A summary of their activities is given below.

- 1. *Mobile trainers' groups:*** consisted of 3 small groups of 3 persons working in all 12 provinces in the MRD. In each group, there was 1 trainer on PHH technology, 1 trainer on management, 1 on marketing. This work was the starting point of PHHC implementation of training. "Training of trainers" was done in courses organized by PHHC or trainers sent by research institutions. The training composed different subjects on technology, training methodology, training planning. After those courses, PHHC managers gave support applying the knowledge they had gained. The mobile trainer groups were well trained and worked under effective PHHC managers' supervision, with good collaboration with the DARDs. The effectiveness of these groups was high.
- 2. *Provincial technical advisers (PTA):*** The PTAs were responsible for implementing PHHC activities in the 13 MRD provinces. The PHHC recruited this group on an ad hoc basis. All of them were university graduates, with differing backgrounds (e.g. agriculture, economic, and pedagogy). Only one PTA had a mechanical engineering background. Before starting work, the PTAs received training in such subjects as technology, project planning, teaching methodology, and participated in a number of study tours for 20 days. The role of PTA was very important in project implementation. They were in direct contact with Service Providers, providing support needed to encourage investments in driers and post harvest equipment.

Overall, the PHHC did a good job in setting up the mobile trainers group and PTA cadre, enhancing their knowledge and skills, and offering reasonable incentives. The motivation of staff was high and they worked effectively.

PTA's were directly employed by the PHH component and were not part of the formal MARD organisations. For the successful component implementation PTA's played a crucial role. For sustainability after component completion, the employment method could pose a risk, because they will need to look for other jobs.

7.1.2. Training achievements

Kindly refer to special Annex 11. for a comprehensive consolidated overview of training data covering the period from 2001 to end of 2006.

Training for (potential) Service Providers

PHHC focused on potential Service Providers during the first years of the component. Among those people, there were millers, traders and dryer owners. The selection of participants was not done very systematically and was subject to time pressure, resulting sometimes in the wrong people joining the four days' training courses for SPs. Training subjects included PHH technology, management and marketing. According to participants the training content was relevant.

In the beginning, for potential Service Provider training was organized as follows:

Classes -----> field visit -----> direct contact with PTA.

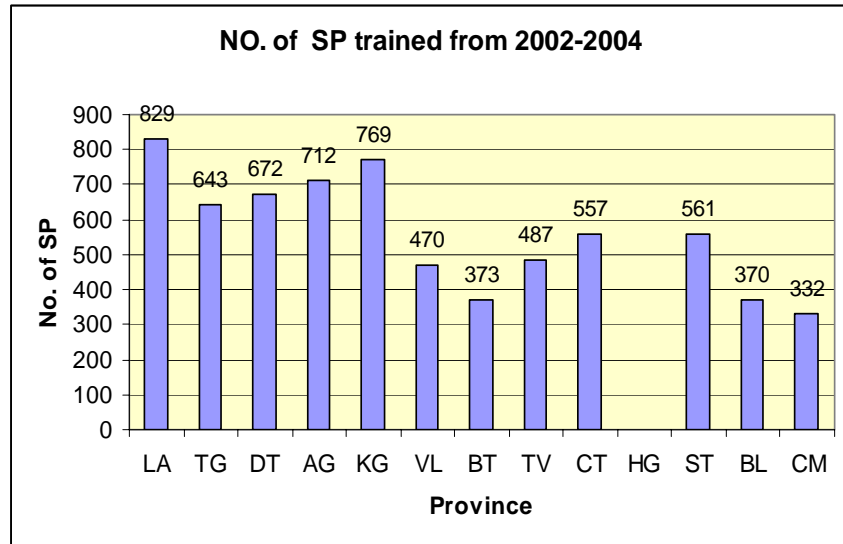
However PHHC recognized that this order was not efficient, because it was costly as it involved offering classes to potential SPs before the extent of their interest as established..

As a response the order for SP training was changed to:

Field visit-----> Classes -----> Direct contact with PTA.

This method proved to be better, because the field visit was used as a selection tool through which PTAs could identify the truly potential SPs.

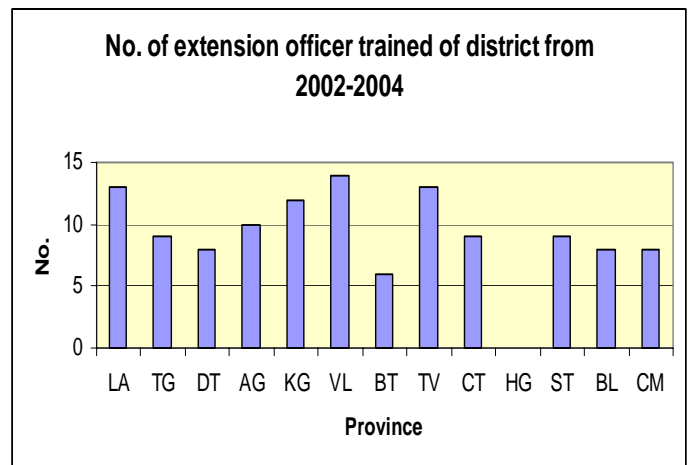
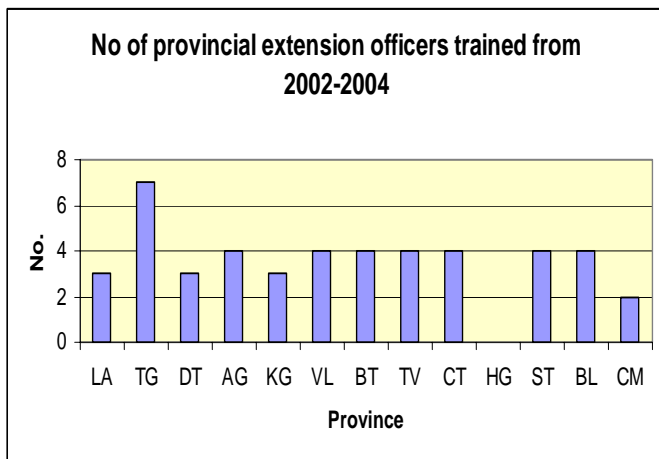
Some large farmers and millers had the means to invest, but were often too busy to go to training classes. For those people, a study tour of one day was sufficient, followed by direct contacts with the PTA to offer more information on the type of dryer and other equipment to make a proper decision.



Training for extension officers (EO)

Provincial and district extension officers (EOs) were offered training by the PHHC. EOs were trained in PHH technology, teaching methodology, training and planning. These people were trained to become resource persons for PHH issues for commune extension workers and farmer trainers.

As is stated elsewhere, some efforts were made to present training materials in Khmer, but more attention could have given from the outset to identifying a small cadre of Khmer speakers to play an active role in the program and specific budgetary provision could have been made for that purpose.



PHH components focused on capacity building for local officers to achieve maximum sustainability after the project ends. Many of the EOs had never been exposed to PHH technology before.

The main difficulty faced by Eos in consolidating their PHH knowledge is the demands of their regular assignments. The EOs could not dedicate sufficient time to PHH issues following their training.

Although some were able to consolidate their knowledge through working with PTAs, .due to a number of reasons this sometimes did not work out:

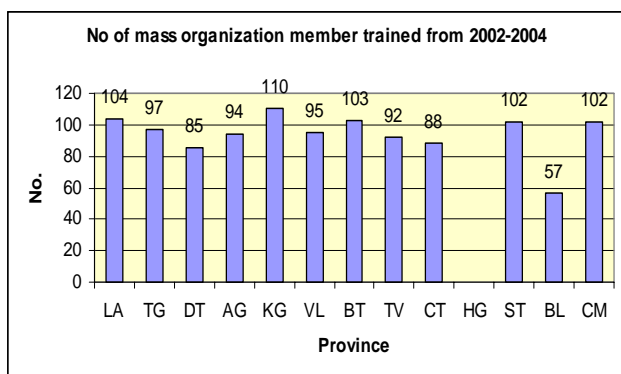
- PHH is not their primary task,
- In some AEC, extension officers were given a monthly lump sum for working in the field. If they needed to work more than was originally envisaged in order to incorporate PHH issues, this lump sum was not sufficient to cover their expenditures.
- PHHC had no budget to support extension workers.

Training for communal extension workers (CEW)

CEWs have regular contacts with farmers in their communes. The CEW role is important in mobilizing farmers and district provincial extension staff. Only limited training for this group was offered late in the project cycle under the so-called sustainability plan (end of 2004 – 2005).

Mass organisations (MO) training

PHHC sought to transfer PHH awareness to the members of mass organisations. MO training is potentially good for sustainability, but after training, there were not enough follow- up activities to encourage the trainees to promote awareness on PHH issues among mass organisation.



Training of Farmers

Training on PHH subjects was introduced in farmer classes dealing with other main subjects. PHH formed only a small part in training sessions conducted by EOs.

PHH training for farmers was done in 2005-2006 as part of the sustainability phase. It might have been better if the training for farmers had been carried out immediately after the SP training in order for farmers to appreciate the advantages of PHH technology. This could have increased the demand for PHH services at an earlier stage of the programme

Training for farmers of 135 programme

The PHH component in the 135 programme (poor farmers) concentrated on how to reduce losses during harvesting and drying.

Bank credit staff

The PHH Component offered bank staff training on effective PHH services to help the banks make effective decisions on credit provision.

Training for dryer builders

The PHHC organized training for those constructing and modifying PH machinery. Training was offered on how to build driers and design better adapted models. However it was observed that some of the trainees had no opportunity to practice their skills for the development of PH equipment, as they moved to other work in the MRD.

Cooperative staff

Training was provided on technical knowledge and management of dryer services for staff and member of cooperatives

Training for vice chairman of communes

The design of this training was very good but this training was provided rather late (Dec, 2006). It would have been better to organize this training in the beginning of the project so that these community leaders could stimulate farmers' interest in PHH.

Key training achievements PHHC MRD as per June 30, 2006

Training 2001 - 2006	number of activities	number of trainees
Output 5		
Moving trainers	3	46
Training of Trainers (all types of)	32	721
Field trip for service providers	433	14,219
Service Providers	271	6,987
VBARD staff	4	139
Installation dryers	10	222
Vice Chairmen CPC	10	285
Mass organizations	23	1,129
Rice milling technology	2	35
Training Coop members	15	431
(sub) total output 5	803	24,214
Output 6		
135 farmers	40	1,861
Commune extension workers	35	943
district extension workers	14	372
Training of trainers (all other types)	13	362
(sub) total output 6	102	3,538

Training 2005 - 2006	number of activities	number of trainees
Sustainability phase		
Output 5		
Service Provider course (5-day)	110	3.128
Visits and demonstrations (1-day)	23	2.530
Service Provider course (1 or 2-day)	13	424
Output 6		
Extensionist course (5-day)	40	1.159
Farmer course (5-day)	728	22.867
Extensionist course (2-day)	4	93
Farmer course (1/2-day)	142	4.027
(sub) total sustainability phase	1.060	34.228

7.1.3. Forms of training and training materials

Study tours (field visits) stimulated potential SP's interest. PHHC conducted visits to successful owners of PHH equipment. These visits had a strong demonstration effect and also facilitated sharing experiences and discussions with fellow SPs. Study tours and demonstrations were found to be effective in stimulating potential SPs to invest in PH machines. Study tours took only 1 day but were suitable for SP's and big farmers who did not have the time to attend long courses.

Classes: this was the main training form conducted by the PHHC. Mobile trainers conducted the training for potential SP, providing good training in PHH techniques. Duration of potential SP class was around 4 to 5 days.

Documentation: The following training materials were produced by the PHHC.

Handbooks and training materials:

- The documents which have been studied by the mission seemed to be well prepared, although some were not very specific and were too theoretical for their clientele.
- PHHC produced leaflets in Khmer - a commendable effort for the PHHC. However some Khmer cannot read the Khmer language, so are better approached through verbal and visual presentations.
- **CD's:** PHHC produced a range of CDs on the major PH issues. Some CDs were produced in Khmer.

Teaching aids:

- PHHC produced flip- charts and sets of transparencies for use by mobile trainers and extension officers. This was a good contribution to increasing the effectiveness of training classes. However, some teaching aids were delivered late, after farmers classes had been conducted.

Mass media: PTAs successfully collaborated with provincial mass media (radio, TV) and PHH issues were broadcasted at least 30 times. PTAs were highly motivated to introduce PHH advantages to farmers on a large scale through radio and TV. Unfortunately some TV presentations were somewhat academic, while others were mainly suitable to promote farmer awareness.

Overall assessment: Based on field observation, the mission judged that PHH training activities were reasonably well targeted and deemed effective as well as efficient taken into account the large numbers of people that have been reached. A large number of participants of all kinds of PHH training courses were interviewed throughout the MRD. Most of the interviewees said that their PHH knowledge and attitude was extended due to the programme and that they intended to use this knowledge in practice.

However, more attention should have been given to presentation materials in a form effectively adapted to the practical needs and level of comprehension of the target groups.

The PHHC reached a diverse range of people who could spread the PHHC messages. Supported by the training materials and the successful training model, DARDs should continue to focus on PHH for reducing the lost on rice production.

7.1.4. Some lessons learnt regarding training activities

Issues	Lesson learnt
Mobile trainers and provincial advisers are free lance staff.	DARDs should have sent staff to work with the PHH component so that after project completion, they could have returned to DARD to work on PHH provincial programs
Capacity of EOs at province and districts levels is not strong enough to deliver an effective PHH program	<p>After being trained, EOs need to get more experience on PHH through working together with PTA.</p> <p>EOs working on PHH with provincial advisers should have been offered financial incentives, particularly in the beginning period of project implementation. (AEC are given a lump sump per month for travel and food. If they go to the field for PHH, this is not enough)</p>
Proportion of trained people becoming SP after training was too low	It would have been better to extend the time for implementation of SP training. When the first generation of potential SP trained invested in PHH services, the demonstration effect would attract additional investors and the PAs could easily identify the real potential SP. The number of trainees in SP training could have been reduced but the rate of people becoming SP after being trained increased' This would have been more cost effective.
Mass organization officers trained but their contribution to the PHH activities is limited	Follow up activities are needed with trainees, to encourage them to create interest for their members.
Farmer awareness on the necessity of PHH technology is still low in some areas.	Increase propaganda activities through the collaboration with mass media. Try to use more attractive forms for propaganda

Recommendations:

Recommendation	How to implement
PHH must become one of the main parts of DARD programs on high yield rice production	Each province should appoint officers in charge PHH who should be responsible for updating knowledge on PHH and providing training to CEWs, advice to potential SP and to farmers.
Increasing mobilization and propaganda to farmers on the advantages of PHH services	Collaboration with mass organizations. Increasing the collaboration with mass media, in both the Viet and Khmer languages (An Giang, Soc Trang, and Tra Vinh). TV shows should be attractive and practical rather than “academic”.
Support SP and potential SP with information concerning PHH for decision making	- Offer updated training for CEWs on PHH. They can directly contact SP to supply information.

7.2. Technology

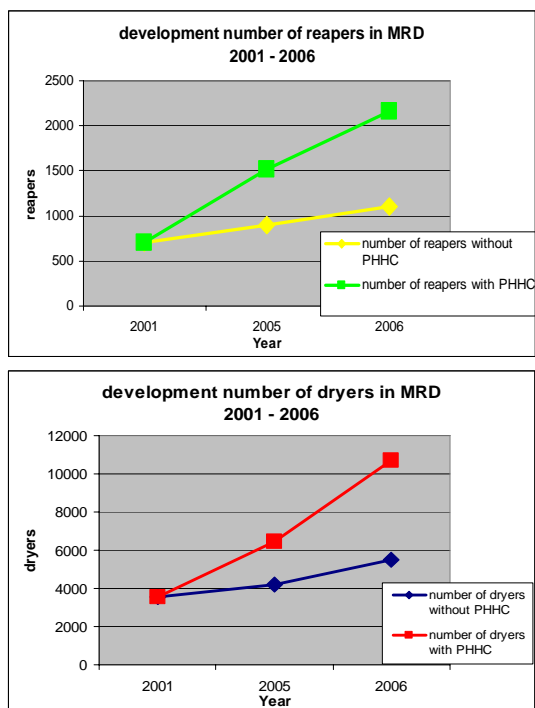
Important reasons to promote the use of post-harvest machinery are:

- To reduce post-harvest losses and meet the practical needs of farmers
- To deal with labour shortage problems
- To improve product quality

7.2.1. Impact on use of post harvest equipment

Spread of PHH technology in the MRD as per June 30, 2006

Item	Realized in MRD Mar 01- Jun 06 (*)	Total number present in MRD (2006)
Equipment		
Reapers	1,457	2,159
Dryers (all types)	3,250	10,639
VBARD loans (total)	1,830	NA
VBARD loans (total for PH equipment)	1,520	NA
milling plants (all types)	?	8,925
treshers	?	32,313
combine harvesters	450	500
(*) it is unclear how many reapers / dryers can be directly attributed to PHHC interventions		



The PHHC has supported the transition of the traditional rice based production systems in the Mekong River Delta into more complex rice supply chains. These developments have started recently and are likely to have considerable impact on the production system itself, the quantity and quality of the rice produced as well as labour requirements and social aspects in the MRD.

The project staffs have attempted a number of tabulations, attributing the spread of machinery installation to project activities in highly specific detail. The logic on which these estimates are apparently based is the belief that if a beneficiary of project training subsequently acquires equipment that can be attributed as having been the result of the training. However, some beneficiaries might have purchased equipment even if they had not attended a course. Indeed it was entirely appropriate for the programme to target and provide training to those who were already committed to purchasing equipment. At the same time, it could be argued that some of the positive effects of the programme might have spread beyond the trainee group, as a result of the spread of knowledge and the example provided by trainees.

The mission concluded that it is not possible to separate out the effect of PHHC interventions from the overall developments in the MRD and the autonomous demand for more and better post harvest technology and equipment.

However, even if only 50% of the increase attributed to the programme in staff estimates was in fact an actual result of project interventions, that would be a good result. The PHHC has definitely accelerated developments in the rice production system in the MRD.

However, despite the progress, only about 30 – 35 % of the total rice production can be dried in the period June – September. It is difficult to judge what will be the

eventual limit for the proportion of the harvest that is machine dried. The financial return from machine drying is not such that it is ever likely to be a universal practice.

With the widespread knowledge of mechanical drying options now existing, further special interventions are not needed to accelerate developments; It can be left to the market supported by the extension service to spread the technologies introduced by the project..

7.2.2. Current situation in the use and provision of equipment

Dryers

In the MRD region, as of March 2007, it was estimated that there were a total of 7352 units. Statistical data suggest that mechanically dried rice now accounts for in the region of 30-40% of the total annual harvest amount. However, during field interviews, responses indicated a quite varied picture, not always in line with available statistics.

The number of dryers has seen a 2 ½ fold increase since 2002 (from 2946 to 7352). This is partly attributable to efforts made by the programme. The typical dryer is a simple flat-bed structure, which use husks as fuel (cheap in price). This model appears to be appropriate for current conditions in the MRD. However, as volumes processed increase there is likely to be a need for new models of dryers that are more automatic and able to reduce the process time and cost, as well as improve rice quality. Dryers appear to be larger and used more efficiently by merchants and millers, who enjoy the advantage of better access to information and capital.

It is difficult to promote the use of dryers among poor farmers due to the limited quantity of rice they produce. Many continue to use sun drying where there is no dryer or people have to queue. If the dryer is too far from the field use becomes too costly.

The PHH component supported the development and introduction of 2 ton (mobile) flat batch dryers during the initial phase of implementation, but adoption was not widespread. Some reasons for this low level of adoption are summarized in Annex 6 in which a comparison of a small (2 ton) and a larger (10 ton) dryer is made. In particular the number of operational days has a great influence on the overall feasibility of these small dryers (and as a result the drying price per kg and the pay back period). Experience suggests that the future lies with larger scale dryers given the economies of scale.

9 out of 10 interviewees agreed that they were able to reduce the rate of broken rice after milling by following closely the technical instruction by PHHC advisors. Income can be increased by 1.5-1.8% due to the difference in rice prices

Reapers and combine harvesters

In the 13 MRD provinces, it was estimated (2005) that there were approximately 1770 reapers, mainly in high production areas such as Long An (1106 units), Dong Thap (248 units), An Giang (108 units), Can Tho (79 units).

Combine harvesters did not receive much attention until recently. In 2005 it was estimated that there were still only 33 units throughout the region, mainly in high production areas such as An Giang (11), Long An (9), Can Tho (8), Soc Trang (3), Dong Thap (1), but the situation is changing rapidly. Latest estimates suggest that there are now as many as 500 combine harvesters in the region mainly in provinces with large farm sizes, such as An Giang (140), Kien Giang (130), Long An (90), Dong Thap (37), Can Tho (25). A number of different models are in use, including those modified by local manufacturers

Box 1. Example of meeting with informants:

Meeting with Long An Provincial leaders

- The mission met with Mr. Nguyen Thanh Nguyen, Deputy Chairman of Long An People's Committee, Mr. Tran Minh Tung, Deputy Director DARD Long An, Mr. Vo Tung Son, acting Director External Affairs Department, Mr. Van, Acting Director Industry Department.
- Mr. Nguyen said there was an increasing demand for PHH technology, mainly in Dong Thap Muoi areas. The most difficult activities was harvesting and drying in the Summer-Autumn Crop (rainy season). Other included changing methods of production and shortage of labour for harvesting, drying soil preparation, Threshing activities had been mechanized almost 100%
- Province has been preparing to help farmers buy combined harvesters

Threshers

The whole region was estimated to have 42 thousand machines of different kinds. In discussion with local managers, PTAs and farmers, the mission noticed that threshing is now 100% mechanically conducted. Even poor farmers use this service. In addition, some collector and thresher manufacturing businesses have been established (for example, Phan Tan, My Quy, Thap Muoi, Dong Thap).

Box 2. Example of visiting to an equipment manufacturer : Phan Tan

1. Name of the owner: Phan Tan Ben
2. Location: Cho duong Thet, My Qui, Thap Muoi dist. Dong Thap prov.
3. Fields of activity: repairing and manufacturing threshing, collect- threshing machines
 - This year he began to produce combined harvesters swelling 3-4 pieces with a price 75-77million VND/each.
 - He is the only one in the area making collection-threshing machine, suitable for local conditions
 - He faced difficulties in getting advice on improving his machines. He wishes to acquire more knowledge and exchange experiences and to visit pilot demonstration on PHH technology.
 - The Local Administration did not seem to have the capacity to provide effective technical support.

Mills

Differing estimates are available on the number of millers. Project data suggest that there are 3740 small-size (under 2 tons/hour) mills, 5175 bigger units. In sum, there are 8915 mills of different kinds in the MRD. Most of these mills also serve as a point of rice collection. Many millers have enjoyed increased income and stable input flows thanks to their investment in drying and storing services. Other estimates suggested the number of millers in the MRD can be much bigger— as many as 20,000.

Box 3. Example of visiting to a private rice mill: a successful female miller

1. Name of the Mill: Minh Tam's
2. Location: Ap 5, Di Thanh commune, Thu Thua Dist., Long An prov.
3. Name of owner: Do Thi Chien (chi tu Minh Tam).
4. Capacity: 2 ton paddy/hour
5. Product market: Mainly in local areas
6. Recent problems: shortage of skilled labour, inadequate storage areas for paddy in the harvesting season.
 - Last year, according to PTA (Mr. Hoanh) she established 3 drying lines, after which she could process the incoming paddy more effectively
 - Paddy processed by dryer definitely gives better recovery rate (less broken rice and more head rice)
 - she had developed 3 additional units managed by her family in other locations.

However, some aspects of the PHH machinery (cutters, threshers, combine harvesters, mills) were not the project's targets. The wide dissemination of such machines results from practical demands rather than from the impact of the PHHC itself.

Box 4. Example of visit to dryer & mill owner

1. Name of owner: Mr. Banh Duc Phong
2. Location: Cau Ke dist., Tra Vinh prov.
3. Purpose of dryer installation: To improve the rice collection in the different conditions in order to establish consistency supply rice- paddy for the Mill.
 - After attending the training course held by PHS he began to build the dryer and burner. Since this point he has been able to collect more paddy, drying 2 batches daily - 12 ton per batch.
 - He has been able to supply technical knowledge to other farmers in the area as a lower charge than from large organisations.
 - He charges 100 000VND/ton for drying rice, of which 50% is his gross return.
4. Success factors:
 - Attention to reducing drying cost
 - Suitable construction and capacity of dryer
 - Support and recommendation from PTA
 - Meeting local demand for rice processing

Box 5: Visit to Kmer Cooperative

1. Name of The Cooperative: Tri Phong
2. Manager: Mr. Kien Ngone, Mr. Kien So Khanh (deputy manager)
3. Field of activity: Service provider in soil preparation, harvesting, threshing, drying fertilizer,
4. No of participant: 82 persons, in which 67 are Kmer minority
5. Date of establishment: June 1999
 - After visiting demonstrations in Tieu Can & Chau Thanh district, they purchased a harvesting machine 22 millionVND for employ.
 - The training course from the PHHSC helped them to manage the machine better and reduce losses from 1.5% to 0.5% in cutting operation; from 2.5% to 1% in threshing
 - They are planning to develop their activities into rice transporting and storage services.
 - They have problem in language communication especially in reading,

7.2.2. Impact assessment

The initial project emphasis on dryers was sensible since controlling the rice's moisture content is a key factor to ensure its quality.

PHHC activities have improved knowledge, attitudes and, practice among key target groups (public service and private enterprise managers, merchants, and farmers) of PHH technology. More specifically, initially many farmers did not know about rice dryers, now they have realized the importance and benefits of dryers.

Some service providers have learned how to modify machines to save energy cost and improve productivity. PHHC activities have made a positive impact on provincial staff, some of whom are preparing plans to develop projects in the coming period.

In the future, there is a need for extension support specifically aimed at providing technical know how to small-scale machinery providers. This will require either the recruitment and training of extension staff with appropriate mechanical engineering skills, or encouragement to existing research institutions to address the needs of this sub-sector.

Some critical points about technology are

- The project has not addressed storage and warehouses needs. In collecting points and at mills, rice is not stored with sufficient space, thus affecting its quality and violating fire prevention rules. The project has scarcely mentioned storage and warehouse issues.
- Apart from training classes, the project has not provided support to equipment manufacturers. There are some big manufacturers (e.g. LAMICO and Bui Van Ngo) along with many post harvest machine workshops operating on a small scale. The small workshops equipments are simple; their organisation structure is not orderly. Furthermore, they lack capital, experience exchange, in-depth technical advice

The project has been a technical success because

- The project has chosen activities that meet the actual need of the industry.
- The organisation tasks have been well implemented: there has been a close coordination with state management agencies (at Ministry, DARD, provincial and district levels).
- Forms of activities are diverse including training classes, demonstrations, seminars and mass media.

However, there have been some shortcomings such as

- Some activities have not been held in sufficient depth
- The changes in the industry during the 5 years had not been predicted and appropriate response prepared in advance such as the need for combine harvesters.
- Suitable models should be introduced commensurate with local conditions and farm size.
- The salary and professionalism of extension officers at the district and commune levels remain limited.
- Documentation: areas which need better documentation include the following:
 - Factors which contribute to the acceptance/non-acceptance of the technology
 - Indicators of success

7.2.3. Recommendations on technology

- Specialized research organisations such as VIAEP, the MRD Rice Research Institutes should improve the design of PHH machines (reapers, combine harvesters, collectors and threshers) to meet farmers' demand.
- Further research is required on modifying static driers to reduce fuel and processing time. New research is needed on the design of tower dryers to meet the future demands. Advanced rice dryers, for instance recirculation columnar dryers, should be researched to substitute for the flat-bed dryers as the demand of commercial rice drying grows and to economize on space.
- Manuals are needed on operation and maintenance, etc of PHH machines and on labour safety. These manuals should be integrated into professional training programs for rural youth to help the local authorities deal with the shortage of rural workers.
- Action is required on storage: Specific guidance should be provided to improve managerial skills, sanitation, export rice quality etc.
- Provincial advisers who were trained by PHHC and worked efficiently should be assimilated into DARDs, AECs so that their experience and knowledge can be used for developing on PHT in the future.
- After project completion, local governments, DARDs and AECs, should continue implementing PHT activities. A key requirement for formulating or improving strategies for PHT development in MRD is to involve people with a wide range of experience in the planning process. This requires that MARD should support DARD's in efforts to persuade the Provincial People's Committees to give higher priority to PHH than in the past. The DARD's themselves need to ensure that their

staff and extension officers put PHH on their work agendas. In all DARD's there should be offices specifically assigned to develop specialist skills in PHH.

- The DARD's and the extension service need to make conscious efforts to establish closer links with research institutions and specialist.

7.3. Sustainability

In relation to component activities, sustainability can have two meanings.

The first concerns the degree to which PHHC beneficiaries will continue to utilize their newly acquired knowledge and equipment. In this sense, there is every reason to suppose that the project has made a permanent contribution to technical know-how in the MRD, and that the process of technical innovation will be sustained after project completion.

The second relates to institutional capacity building. With the completion of the project, how far can DARD and AEC's be expected to continue to deliver PHH services and training courses?

In relation to sustainability in this sense the prospects seem positive, although the outcome is uncertain. PHH issues have received more attention at a national level recently. In the MRD, a number of provincial authorities have indicated their willingness to institutionalize the expertise on Post Harvest Technology acquired under the ASPS programme. However, it is not yet clear whether the knowledge of extension staff has been enhanced sufficiently to make effective contributions on PHH.

One issue for the future is that with developments in equipment and technology service and machinery providers will need specialized, independent advice of a kind which is probably beyond the existing expertise of the extension services.

There is some cause for concern regarding who will supply the provincial staff with reliable information on the latest developments on post harvest techniques and equipment. In the future provincial extension workers still need to be supplied with the latest technical information.

For this to be done, explicit consideration needs to be given to on-going in-service training for DARD staff and extension workers on developments in PHH. This should not be seen as a thing that mainly happens through a donor sponsored project, but should be built into the work-plans and staff development planning by provincial level authorities, supported by the provision of appropriate workshops/training courses by MARD.

The private sector is of increasing strength, but small and medium size operators will continue to need technical help from government as regards appropriate technology – provision of extension support backed up with a good applied research capacity should become the prime focus of MARD in the future in this and other areas, with agricultural production and service provision being the responsibility of non-government actors.

Another issue related to the sustainability of the competence built up among component staff. PTA's have been employed directly by the PHH component for a number of years under special DANIDA conditions. These PTA's are now highly

skilled in post harvest technology. Under current plans, they will not be absorbed by the DARD institutions. Some of those interviewed indicated that they might use their expertise to start private businesses as service providers. In entering the commercial market, the PTAs could make a significant contribution to the sustaining of PHH innovations. If a considerable number of PTA's find a jobs as or with a service provider, milling plant or elsewhere in the rice industry their skills and capacities as developed under the PHHC will still be available, albeit at a commercial basis. In an economy which is not essentially driven by the private sector, this may be as, if not more, important than sustaining the capacity of government services.

It may be worth commenting further on the implications of implementing the programme through the employment of a professional cadre under special terms and conditions who were not part of the government service. This went against recent donor orthodoxy, which has tended to question the merits of autonomous project units and project funding of special financial incentives for national project staff. Obviously, this does carry risks for sustainability mentioned above and also carries the related risk of making it more difficult to integrate project activities into departmental programs. However, there was also a clear trade-off in this case. By employing national experts supported by a very limited expatriate component the project was implemented effectively, at a much lower cost than would have been the case if more international experts had been mobilized. Moreover, by funding the recurrent costs of national experts the project was able to ensure a more concentrated effort on PHH than would have been possible within the tight constraints of departmental budgets. The success of the project suggests the virtue of certain pragmatism in project design, particularly when it comes to engaging the local actors in project implementation.

The key local figures need to be identified and their own motivations and capacities understood. One of the successes of the project was that project staff seemed to do this quite clearly in practice, at the grass-roots level.

This is most likely to be achieved if the project management structures are such that there is decentralisation to project staff in the field, rather than tight control from headquarters. This project benefited from the important role played by the management unit in the MRD (Can Tho) and the good deal of independent initiative of provincial level staff.

7.4. Synergy between PHH sub components and research

Under sub component 3 and 4 a number of research projects were funded by the ASPS programme related to post harvest issues for rice and maize as well as other crops. The original idea was to build and strengthen R&D capacity within Vietnamese research institutes on post harvest and handling and to support field activities with the latest results from R&D.

In order to assess whether and to what extent R&D results have contributed to the key objectives of the PHH component the mission has studied a selection of the research reports ⁴ on rice in more detail. The mission has based its opinion on the contribution

⁴ The list of research projects that have been studied by the mission is attached in Annex 3.

of R&D projects to the development objectives on the reports examined and on interviews.

In general, the timing of the research projects was unfortunate as results were not in time to contribute to the realisation of the other objectives. Research projects started only after a lengthy reviewing procedure and re-writing of project proposals. The criteria for project submission and approval were not very clear which has hampered progress.

Even where topics investigated were potentially relevant, they did not in practice support the implementation of the programme and did not substantially contribute to the overall impact of the programme. Research projects were executed in isolation from the rest of the component. More effort could have been made to create synergy between results of research projects and development and training activities in the field under 5 and 6. The link between these research projects and the key objectives of the PHHC was not well understood.

However, the mission fully supports the idea of capacity building of R&D institutes in the field of Post Harvest research, particularly aimed at problem solving and client oriented research in support of field extension activities. What is required is institutional mechanisms to ensure that research institutes and their staff are exposed to the concerns and constraints facing the intended beneficiaries of their research. This could be done for example by ensuring that funded research projects had a component involving an advisory panel of practitioners who could act as a sounding board and offer their views as regards the viability of potential innovations.

7.5. National Post Harvest Strategy

In 2007, towards the end of the ASPS /PHH component, the National Post Harvest strategy was approved by MARD. The NPHS will contribute to putting post harvest issues on the political and development agenda. The NPHS appears to be a sound strategy for the next decade, although somewhat conservative in its goals.

Despite current weaknesses and overlap in the system between Government institutions at district level (and probably also at Provincial and National level), a new structure was not proposed. The strategy could also have given more emphasis on improving quality to strengthen the competitive position of Vietnam in international trade.

The strategy would also have benefited from a clearer discussion of division of labour between the public and private sectors, an important issue in the next decade.

The NPHS is not very specific on the division between public tasks and what the private sector is supposed to do. Public / private cooperation is likely to become an important issue in the next decade.

8. Overall assessment: Achievements, weaknesses, lessons for project design

Overall conclusion: Successful implementation

The team has been impressed by the vigorous implementation of the project, the scale and range of activities, and the knowledge and dedication of the staff employed by the project in the provinces.

Since start of operation in MRD (May 2001) the Component has provided substantial PH training support to nearly 30,000 farmers, 7,210 service providers, 13 cooperatives and 624 extension officers. In addition the component has carried out PH mass media campaigns and supported 4 PH research projects related to MRD. A significant amount of post harvest equipment and machinery has been installed or upgraded.

Taking into account the huge area that the 12 provinces⁵ that form the MRD covers, the sheer number of farmers and the relatively small size of the PHHC (in terms of budget and manpower), any programme can be expected to only have a limited impact on the overall developments in the area. Nevertheless, the project facilitated a strategic process of change in the MRD, and achieved its stated objectives in relation to technical change.

Reasons for success:

- The project objectives were clearly formulated and very relevant to the current stage of the development of the rice industry;
- The organisational model was straightforward, allocating operational responsibility to qualified professional staff recruited to the project in each province, backed up by effective administration in the management unit in Can Tho;
- The project staff had a good knowledge of the key actors in each province supplying services and technology to the sector;
- In most cases, the project seems to have received good support from the DARD and the provincial authorities.

Limited possibilities of quantitative evaluation: The possibility of evaluation based on quantitative estimates is limited for two sorts of reason. The first is the lack of definitive base line data on PHH losses in the target provinces. However, even if such data were available attribution of cause is not possible because of the rapid and pervasive change in the rice sector over the period, making it impossible to isolate the quantitative impact of any particular interventions being studied. Thus although it is clear that the technical innovations the project has been promoting have been implemented quite widely, and a reasonable qualitative judgement can be made that

⁵ Or 13 provinces including the city of Can Tho

project activities made a significant contribution to the observable changes in the industry, it is not possible to attribute to the project a specific quantitative effect.

Need for realism in assessment: Although the project has been very active and has had significant resources at its disposal, it should also be recognised that it is a small part of a very big picture. There is now more than 19 million tons of rice produced annually in the Mekong and the numbers of actors in the industry is huge (e.g. it has been estimated that there are more than 20,000 millers). Any donor funded intervention must therefore to some degree be supplementary to the other forces affecting change. In these conditions, projects can be expected to facilitate and reinforce processes of change rather than claim to be the main driver of progress. Nevertheless the contribution can be useful and justified.

Sustainability: It is too early to judge sustainability after project completion. However, it will certainly be the case that the knowledge spread regarding new PHH technology will have a permanent impact on the stock of knowledge in the MRD. Also, there are positive signs that a number of People's Committees are giving priority to post-harvest activities and making budgetary allocations accordingly.

Some key lessons:

1. If the intention is to target specific groups, there is a need to explore the situation of the target groups, their needs, potential and constraints, in order to identify the best instruments to meet their needs. It makes less sense to identify an instrument first and then seek to involve the target groups, irrespective of whether that instrument is geared to meet their needs.
2. In promoting innovations, it is important to have a realistic assessment of the economic attractiveness of the innovation to the various participants in the industry – e.g. by and large, the scale of driers is too large and the profit margin too narrow for mechanical drying to be a farm level activity – in practice it has been undertaken by service providers, cooperative groups, traders and millers. Was this understood at the time of design?
3. In a highly dynamic, fast-growing economy it must be recognised that over the life of a project (from initial project identification to completion, i.e. about six years), conditions in the industry are likely to change rapidly, resulting in new needs and possibilities. For example, the rapid growth in off-farm employment opportunities has resulted in labour scarcities in some district, increasing the demands for labour saving on-farm technology - the need for cutters, combined harvesters, etc. has increase dramatically during the project life-time. Now the demand from farmers is for harvesting equipment rather than driers. Also as the industry has become more sophisticated, and the need for quality increased, a more sophisticated division of labour has emerged, suggesting the need to increasing attention to the needs of SME's supporting the farming sector (including millers and traders).

4. **The general point is that in the design of a project in a sector with the dynamism of the Vietnamese rice industry, there should be built-in flexibility to adjust the project to the evolving needs of the industry.**
5. However, the team noted that project staff showed a good degree of pragmatism in gearing project activities to the needs of the actors in the industry.
6. One area in which more help is needed is technical support for small-scale machinery workshops, repairing, modifying and manufacturing equipment. Those working in such activities do not find that there is effective help available in terms of technical support for design and other technical issues.
7. The condition of the really poor is most affected by developments in the job market – with expansion in off-farm employment providing new income opportunities, and farm mechanisation enabling farmers to pay higher wages.
8. Access for ethnic minorities is likely to be dependent on language; this may be an important lesson for new DANIDA projects focussing on ethnic minorities – specific provision may be required to ensure the availability of appropriate linguistic skills.
9. Ethnic minorities are disadvantaged by language, cultural distance from the Kinh society and often by remote location. Because of these factors servicing these groups is not easy, and is only likely to be successful if explicit attention is given to their special requirements at the design stage of the project, and if special efforts are made to involve members of the community in all aspects of implementation.