

# Workshop Report Postharvest Learning Alliance for Cambodia

## “Market Assessment and Communications Strategies”

ADB RETA No. 6489

*Bringing about a Sustainable Agronomic Revolution in Rice Production in Asia by  
Reducing Preventable Pre- and Postharvest Losses*

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Ministry of Agriculture, Fisheries, and Forestry (MAFF)  
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Figure 1: Workshop Participants



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## 1.0 Background

Postharvest rice losses in Cambodia as in other Southeast Asian countries are typically 15-20% in weight loss. When quality is considered, it can result in a 10-30% loss of value in the market. To address critical postharvest issues, the Cambodian Postharvest Learning Alliance concept was introduced during the Participatory Impact Pathway Workshop (PIPA) conducted at the Ministry of Agriculture, Fisheries, and Forestry (MAFF) in Phnom Penh, 15-19 December 2008. The learning alliance concept has been pursued in Cambodia, as well as in Vietnam and the Philippines, to strengthen in-country postharvest innovation systems and facilitate dissemination of postharvest technologies as part of a “second phase” initiative funded by ADB RETA 6489, “Bringing about a Sustainable Agronomic Revolution in Rice Production in Asia by Reducing Preventable Pre- and Postharvest Losses.”

A “first phase” initiative pilot tested various postharvest management options in eight villages in Cambodia and four villages in Vietnam from 2005-08 under the previous ADB/JFP 9036 and also under the SDC-funded Postproduction Work Group of the Irrigated Rice Research Consortium (IRRC) including activities in Indonesia, Lao PDR, and Myanmar. The results demonstrate that postharvest losses can be significantly reduced and incomes increased if farmers and processors are enabled to use improved postharvest management options and technologies, such as mechanized harvesters, paddy dryers, hermetic storage systems and improved milling practices. Additional benefits also accrue from the use of up-to-date market information. As such, these efforts were successful on a pilot basis in Cambodia and elsewhere in SE Asia but not yet sufficient for wider adoption.

This second ADB-funded initiative, targeting postharvest needs in Cambodia, Vietnam, and the Philippines, aims to scale out these technologies to farmers with the objective of reaching a minimum of 300,000 households after 5 years. This second phase initiative began in Cambodia with the PIPA Workshop to establish the Learning Alliance concept (in Dec 2008). The goal is to help scale out piloted technologies and postharvest management options while strengthening postharvest agricultural and industrial networks to enable farmers and service providers to access and use these options. In doing so, the Learning Alliance seeks to leverage linkages with public-, NGO-, and private sector stakeholders to better integrate resources and roles for providing operating capital, investment, and marketing services. A major component will be the development of business models for farmers and postharvest practitioners.

### 1.1 Workshop Rationale

This Workshop provides an update on Project activities and postharvest training to date. As stakeholders have raised needs around topics of market assessment and communication, this Workshop also sought to specifically address these issues:

- How to locally operationalize the Learning Alliance? (e.g., topics, priorities, etc)
- How to communicate information on postharvest activities and learning?
- How to sustainably scale out specific postharvest technologies and options?

### 1.2 Workshop Objectives

- Clarify how the Learning Alliance can address topics, activities, and its scope.
- Identify communication needs & strategies.
- Prioritize key PH problems and needs for technology by location/region.

- Establish a “road map” for developing business models for specific PH technologies.
- Determine next steps.

### **1.3 Workshop Deliverables**

- An updated list of Project activities and postharvest training events to date.
- A document from participants of individual and/or organizational activities not mentioned in the above, including learnings and what was most important to them.
- A table of communication avenues and resources currently used in postharvest in Cambodia, with suggestions for improvement.
- A “Top 3” list of postharvest needs and solutions for each region.
- A general “Five Forces” analysis from each regional group that examines industry structure and attractiveness for an identified postharvest technology for their region.
- Depiction of components for developing a business model and how a technology relates to the postharvest value chain.
- List of participant suggestions on how to resource and expand Market Information Board pilot.
- Cross country sharing from counterparts in Vietnam on Learning Alliance activities and project approaches in their country to date (PowerPoint).
- List of suggested next steps for Cambodia.

## **2.0 Workshop Structure**

This Workshop was structured into two parts. The first part consisted of a Project update, review of the Learning Alliance and communication needs and issues. The second part consisted of the first Learning Alliance topics raised by stakeholders to address interest in: 1) market assessment and business models, and 2) market boards and market information systems.

### **2.1 Workshop Agenda**

#### Part I - Review

Session 1: Cambodia Postharvest Project Update

Session 2: Communication Needs & Strategies

Session 3: Learning Alliance Needs and Priorities

#### Part II - Learning Alliance Meeting

Session 4: Analysing Industry Structure and Attractiveness

Session 5: Road Map to Developing a Business Model

Session 6: Market Information Systems and Market Boards

Session 7: Next Steps

(See Appendix 1 for detailed Workshop Agenda.)

## **2.2 Workshop Languages**

Khmer was the working language for the participants during the Workshop. Dr. Meas Pyseth served as translator on behalf of IRRI Workshop facilitators and participants with thanks.

## **2.3 Workshop Participation**

A total of 44 participants attended the Workshop representing a diverse group of stakeholders, including researchers, extensionists, farmers, and the private sector. Approximately half the attendees participated in the previous PIPA Workshop and the other half were new to the Learning Alliance concept but were connected or exposed to Project activities to date. (See Appendix 2 for List of Participants.)

## **3.0 The Workshop**

### **Day 1**

The Workshop was opened by the Deputy Secretary General of MAFF, His Excellency Sen Sovann. Alfred Schmidley, Business Model and Value Chain Specialist at IRRI, provided a brief overview of the current Project, citing global needs to increase rice production and the important role of postharvest in preventing losses and raising farmer incomes. Dr. Meas Pyseth, Director for International Cooperation in MAFF, gave a more detailed overview of Project achievements to date and goals for this Workshop. (Also noteworthy was the attendance of the Secretary General of MAFF, His Excellency Lord Reasmey, who joined our group dinner later that evening.)

### **3.1 Session 1: Cambodia Postharvest Project Update**

Dr. Meas Pyseth presented an update on the Project's completed activities to date (since Dec 2008), including:

- Project agreement finalized (MAFF & IRRI)
- Baseline survey
- Target village selection
- Needs assessments
- Numerous postharvest training events

Regarding the last item, postharvest training, there have been 16 postharvest training activities conducted since the launch of this latest ADB-funded initiative. This training is designed to build competency and awareness of improved technologies and practices in Cambodia's postharvest network. In particular, training has been targeted at key farmer groups and extension networks to lay the "groundwork" for scaling out postharvest technologies. (See Appendix 3 for photos from various postharvest training events.)

**Table 1: Activities completed to date**

	Description	Responsible Party(-ies)	Status	Notes
1	PIPA Workshop Report	Boru Douthwaite	Complete	Jan '09
2	IRRI Local Consultants Team	Martin Gummert	Complete	Jan '09
3	Needs Assessment for new provinces	Rica Flor/IRRI Cambodia Team/PDAs	Complete	Feb 09
4	Baseline Surveys for new provinces	IRRI Cambodia Team/PDAs	Data analysis ongoing	
5	One day Post-harvest Workshop w/ PDAs & Key Farmer Reps	IRRI Cambodia Team	Complete	
6	Proposed Activities & Expenditure	All Counterparts & the Team	Complete	
7	Proposals approved and signed	IRRI and MAFF	Complete	
8	Coordinating Implementation and Resource Allocation	The Team & All Counterparts	Complete	
9	Postharvest Training Courses	The Team & All Counterparts	Complete	For MAFF & PDAs
10	Post Harvest Training Courses – Parts 1 & 2	The Team & All Counterparts	Complete	For All Key Farmers
11	Training Course on Safe Storage of Rice – PDAs	DAM	Complete	For PDAs
12	Training Course on Safe Storage of Rice	DAM	Complete	For Key Farmers in 4 new Provinces
13	Training Course on Extension Methods	PDAs, Key Farmers, CSKU	Complete	
14	Training Courses on Reducing Postharvest Losses	PDAs, Key Farmers, CSKU	Near Complete	For villagers in all 36 new target villages
15	Capacity Building	CSKU	Complete	For Students and Key Farmers
16	Baseline Survey	CSKU	Complete	In two Target Villages

**Table 2: Upcoming Project Activities and Plans**

No.	Description	Responsible party (-ies)	Date
1	Coordinate and facilitate counterparts' activities	PH Project Team & the Dept of Agricultural Machinery (DAM)	Ongoing
2	Commencement of postharvest meetings in villages (3 village per province)	PH Project Team & the Dept of Agricultural Machinery (DAM)	Sept-Dec 09
3	Market Information Boards (2 boards/village?)	PH Project Team & the Dept of Agricultural Machinery (DAM)	Sept-Dec 09
4	Training and Demonstrations - Safe Rice Storage Practices	Provincial Depts of Agriculture (PDAs)	Sept-Dec 09
5	Training and Demonstrations - Safe Rice Storage Practices	CSKU	Sept-Dec 09
6	PH Project & Learning Alliance Workshop	IRRI-MAFF	7-8 Sept 09
7	Postproduction Rice Course	IRRI - to be held in the Philippines	18-31 Oct 09
8	Develop Work Plan activities for coming year(s)	PH Project Team and all counterparts	ongoing

### 3.1.1 Group Exercise – Reflection and Learning in the last 8 months

Participants were seated in pairs and asked to write on cards any activities in the past eight months that they may have engaged in that were not reported or that others may not have known about (Card 1). This would be in connection to the OLM from the previous PIPA workshop on strategies the Project could help implement. Participants were also reminded that there may be activities that were unplanned but contributed to changing knowledge,

attitudes, skills, or behaviour of actors within the postharvest network. On Card 2, each pair wrote down what activity was most important to them and why. On Card 3, each pair wrote down what learning that they gained from activities in the last 8 months. (See summarized results in Table 3 below.)

**Table 3: Group results on reflection and learning over the last 8 months**

<b><i>Card 1: Describe any other activities not included in the Update Presentation*</i></b>	<b><i>Card 2: What activity was the most important to you and why?</i></b>	<b><i>Card 3: What learning have you gained from the activities in the last 8 months?</i></b>
<ul style="list-style-type: none"> <li>○ Moisture meter and thermometer have not reached village level yet</li> <li>○ Establishment of farmers' groups</li> <li>○ Networking with NGOs</li> <li>○ Training on milling</li> <li>○ Regional workshop/meeting</li> <li>○ Demonstration on safe rice storage</li> <li>○ Regional cross visit</li> <li>○ Provincial cross visit</li> <li>○ Contract farming</li> <li>○ Development of rice standard</li> <li>○ Developing strategy to improve/strengthen agro-industry sectors</li> <li>○ Demonstration on dryer</li> <li>○ Providing loan with low interest</li> <li>○ Developing business model</li> <li>○ Providing more training to key farmers and nearby villagers</li> <li>○ Improved granaries</li> <li>○ Training on flat bed dryer</li> <li>○ Setting up flat bed dryer in potential region</li> <li>○ Setting up market board in village</li> <li>○ Creating market information system and</li> <li>○ Broadcasting project activities/technology on radio/TV.</li> </ul>	<ul style="list-style-type: none"> <li>○ Establishment of farmers' groups (easier transfer info/ knowledge)</li> <li>○ Demonstration on safe storage</li> <li>○ Training course on grain quality and post harvest technology</li> <li>○ Demonstration on post harvest technology</li> <li>○ Training course on rice milling</li> <li>○ Training course on agricultural extension methodology (helps participants to plan, communicate and spread knowledge)</li> <li>○ Cross province/country visit</li> <li>○ Market/Information board</li> <li>○ Dryer</li> </ul>	<ul style="list-style-type: none"> <li>○ PH training course</li> <li>○ Post-harvest losses</li> <li>○ Having better ideas on PH</li> <li>○ Agricultural extension methodology</li> <li>○ Grain quality</li> <li>○ How to reduce losses after harvest</li> <li>○ How to use and maintain flat bed dryer</li> <li>○ Useful of market information system and board</li> <li>○ Safe storage</li> <li>○ Learning alliance and communication</li> <li>○ Rice production</li> <li>○ How to transfer knowledge to other farmers</li> <li>○ Communication system</li> <li>○ Rice mill benchmarking.</li> </ul>

\* Some participants wrote activities that they wanted to happen rather than activities that did happen.

### **3.2 Communication Needs and Strategies**

This session began with an emphasis on communicating well to achieve objectives, as in the context of the learning alliance. To communicate well, communication strategies must be formulated in order to provide better control of work, show clearer understanding of the situation, and clearly identify goals.

Ingredients needed in a communication strategy were identified: target groups, objectives, needs of partners, communication tools, timeframe, financial resources. It was mentioned that during the PIPA workshop in December 2008, target groups and objectives for the Learning Alliance had been identified.

Communication materials used during a rat campaign in the Philippines were shown to give participants an idea of possible outputs. This then led to an exercise to audit existing communication avenues and possible ways to improve communication. The participants were divided into 4 groups: 1) MAFF staff, 2) millers, farmers, and university teachers, 3) PDA counterparts, and 4) PDA heads. They were given 20 minutes to fill-out flipcharts before explaining their answers during a plenary session. (See results Table 4 below.)

**Table 4. Audit of Existing Communication Avenues**

<i>Existing Communication Avenues</i>	<i>Drivers</i>	<i>Areas for Improvement</i>	<i>Driver Change of</i>	<i>Resources</i>
<b>Group : PDA Heads</b>				
o Demonstration	o Extension staff		o User o Researcher	o Labor o People with skill
o Radio and TV o Information board	o PDA/MAFF o Cooperative	o Enough tool o Transportation Means	o Private Sector o MAFF	o Regional farmers o Budget
o Leaflet	o Extension staff o Private Sector	o Budget	o NGOs	
o Cross visit	o Extension Staff o Farmer o Facilitator			
<b>Group : Millers, Farmers and Teachers from University</b>				
o Communication	o Cooperative o Rice Millers	o Rice Mill o Sample	o Miller o Trader	o Sample
o Providing Training to Farmer	o Technician  o Key student o Teacher o University o Cooperative	o Picture  o Video o Pilot study o Demonstration	o Researcher  o Teacher o Skilled-Staff o Authorities	o Big Paper  o Group Discussion
o Extending it to farmer	o Key farmer	o Document  o Pictures o Lesson related-joke story	o Authority  o Researcher o Expert o Farmer	o Home to home talk  o Other events
<b>Group : PDA Counterparts</b>				
o Training o Demonstration  o Cross visit  o Leaflet o Radio o TV o Information board o Extension	o Extension staff o PDA  o Key farmer	o Motorbikes o Tool  o Moisture meter, Thermometer, Camera and LCD	o MAFF o Depts under MAFF o PDA  o Extension staff o Farmer	o MAFF o MAFF Depts  o PDA  o Extension staff o Farmer

<i>Existing Communication Avenues</i>	<i>Drivers</i>	<i>Areas for Improvement</i>	<i>Driver Change of</i>	<i>Resources</i>
<b>Group : MAFF and Departments under MAFF</b>				
o Training course to PDA Counterpart	o Dept Staff	o Technical handouts o Technical tools o Demonstration	o IRRI Experts o CARDI o Private Sector	o Leaflet o Picture o Place o People with skill o Tool
o Extension	o Expert	o Tools for gathering info	o Extension Expert	o People with skill o Extension station

### Highlights from flipchart exercise

Overall, the four groups were able to successfully recall and enumerate existing communication avenues and cite possible ways to improve these avenues through available resources. One striking observation from the results was that only the PDA heads and counterparts mentioned radio and TV as existing communication avenues used for disseminating information on rice production. The PDA heads said that they had enough tools to use radio and TV effectively. PDA heads and counterparts gave mostly similar answers to existing communication avenues, and cited mostly materials (e.g., transportation, motorbikes, camera, thermometer, moisture meter, etc.) and budget needed to improve these avenues.

The group composed of farmers, millers, and university teachers focused more on face-to-face communication and training as existing communication avenues. They acknowledged key students, teachers, and the universities, aside from key farmers and technicians as drivers in helping extend technologies to end users. They provided helpful suggestions on how to improve these avenues—through photos (which probably meant posters), videos, and lessons learned (packaged in a funny and entertaining way). They perceived that more involvement from experts, researchers, teachers, millers, and traders as drivers of change will help improve communication of these technologies.

The group from MAFF also cited training and extension activities as existing communication avenues. They cited that technical handouts, technical tools, and their ways of demonstration can be improved. Improved leaflets and photos (which probably meant posters) can be used to further help extend technologies.

**Box 1. Group discussion with key farmers in Pochrey Village, Svay Antor Commune, Svay Antor District, Prey Veng Province**

Farmers interviewed

1. Mr. Im Sak
2. Mr. San Saran
3. Mr. El Phath

**Sources of information on rice production**

The above key farmers receive information from Prey Veng Provincial Department of Agriculture (PDA), MAFF, the Project Team, other key farmers, NGOs, private sector, and traders. This was through face-to-face meetings, training courses, cross-visits to other farmers' fields, videos, magazines, brochures, e-learning CDs, information boards.

**Views on printed materials and IRRI training videos on postproduction**

Farmers usually receive magazines and brochures from NGOs and IRRI, such as the IRRC's newsletter RIPPLE. These materials are found to be useful. One farmer found photos unnecessary; while another farmer said that farmers generally do not want to read. They look at photos first and see whether the material is attractive to them. In the village, most of the farmers are old and font size of printed materials should be easy to read.

As part of outscaling in the villages, the Project Team presents IRRI's postproduction training videos to farmers. They set up a projector, usually outside a school building, and show mainstream movies. They show IRRI videos in between movies. One farmer observed that some farmers stay when they show Chinese movies or comedy but go home when the IRRI videos are being played; They would probably find the IRRI video attractive if it was funny and entertaining like the British TV show *Mr. Bean*.

Project leader Dr. Pyseth Meas expressed the same observation in a separate discussion. He said that farmers preferred communication materials such as videos that are funny. "We Cambodians have been through so much trouble in the past that we just want to laugh." This is why the fact sheets that they are now producing include cartoons or comic strips.

IRRI postproduction CDs were distributed in each project village. Farmers could borrow them whenever needed. This was a series of CDs on topics such as measuring moisture content, sun drying, harvesting systems, and others. Farmers with some training and knowledge on postproduction and younger farmers who have attended high school could follow the instructions. Simpler technologies such as the Super Bag were easy to understand and follow after watching the video. Interviewees agreed that they could follow instructions such as making a thresher only after they've seen the video and visited a manufacturer themselves. "Seeing the actual process is better than just watching on a VCD," says one farmer.

Farmers lent the VCDs to other farmers from within and outside the village who want to watch the videos. In this village, only 10 households have VCD players. Thus, those without VCD players just watch in their neighbors' homes. In other provinces like Battambang, almost all households have VCDs, especially those that are close to the town. One farmer observed, it is those who do not sell wet paddy or do not sell immediately who apply all topics from the VCD series. These are the ones who have the interest to wait until the price is high.

**Views on market information boards**

Farmers found the market boards useful because they learn which month the prices of rice or wet paddy are high, and get up-to-date prices for different varieties in other places. The key farmers are the ones who update the boards. Last year, when the initial phase was still ongoing, they updated the board every 1-3 days. Now, with the project finished, they update the boards every 1-2 weeks, using their own money to call their contacts. Key farmers call the PDA counterpart, Vichet and other contact farmers to get the prices in markets at Neak Leoung, Prey Veng, and Phnom Penh (capital price). This year, after the harvesting season, the farmer interviewed called once to a trader. Most farmers only check the boards when they need to sell their produce. They are not informed every time the boards are updated but they also see the dates when the information was put up. The cooperative is willing to keep this information system going because it provides benefits to the cooperative and to the farmers in the community.

**Preferences on information sources**

Their most preferred source of information on rice production is through face-to-face meetings, training activities, and cross-visits. They said that cross-visits are best to get information and see other farmers' fields and new technologies. They perceived that the more cross-visits conducted, the more benefits they will receive; and the head of the community would be the best person to represent.

When asked whether they watched the agricultural shows on the government-owned TV channel (TV-K), farmers said that they watch occasionally, and that the show only focuses on production technologies and practices, not postharvest. They seldom listen to the radio because they are busy in the fields. They agreed that farmers in the village do not like TV or radio anymore because of many advertisements. Older farmers also do not prefer printed materials. They said that receiving information on postproduction through VCDs are welcome, but as stated earlier, the format should be comical and entertaining to catch the attention of the farmers.

**Box 2. Interview with Mr. Ty Channa, Head of the Training and Information Center of CARDI****Communication and extension materials**

## a. Printed materials such as brochures and posters

CARDI produces scientific and activity/achievement posters for many commodities. Rice is the main commodity. Leaflets on different commodities, about pre- and postharvest technologies and practices are also produced and distributed.

Mr. Ty Channa was the national coordinator of LEARN-IT, an IRRI project, where they produced a CD, web site, and leaflet. CARDI is now preparing a book intended for policymakers, PDAs, extension offices, and provincial districts, about its achievement for the past 10 years.

## b. CD and videos

They have a 30-minute video on rice production, from selecting seeds to postharvest. The script was written by the research division in collaboration with IRRI. Due to limited funds, they have not produced another but they plan to produce a short video on rice production technologies. A private agency will be subcontracted to do the shooting, editing, and production of the DVDs. Mr. Channa believes that farmers appreciate receiving information through videos.

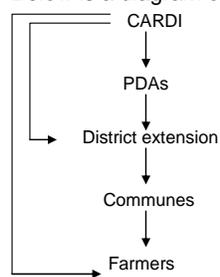
## c. Agricultural TV show

The MAFF pays TV-K (Cambodian national TV which charges less for airtime compared to mainstream TV) to air a talk-show about rice production every Sunday night and Monday noon. MAFF has a working committee with representatives from different organizations (including Mr. Channa) to organize topics for the show. CARDI first tests the technology in the fields of model farmers. They then invite the model farmers as guests on the show, and students to be studio participants. Since 2007, they have featured 10 topics, including how to select good rice varieties.

**Mr. Channa's perception of farmers' preferences**

Mr. Channa said that farmers feel more confident and are easier to convince when they hear feedback on rice production technologies from model farmers. However farmers prefer to receive technical information from extension and provincial officers. The most effective way to communicate to farmers is through field demonstrations where farmers can see and hear the results of experiments and trials. Videos are an indirect way of transferring technologies.

Below is a diagram of how CARDI disseminates information to farmers.



CARDI receives feedback from farmers through monitoring by socioeconomic research division staff; and then sends reports to PDAs.

**Box 3. Recommendations from Communications Specialist, Trina Mendoza**

1. Explore further other possible materials for effective dissemination of information needed by farmers. From the initial discussion with farmers, the Project Team, and through the workshop exercise, video was found to be an appealing source of information. A 10-minute video on an identified topic (e.g., hermetic storage) could be a next step. This would need to be developed in consultation with the Project Team and take into consideration the farmers' preference for humour.
2. Training materials such as posters and brochures can be developed for farmers.
3. After developing initial materials, these should be pre-tested among farmers and other stakeholders.

### 3.3 Defining the Learning Alliance – Needs and Priorities

To review what was introduced during the PIPA workshop (Dec 08), the concept of a learning alliance was briefly explained, along with how it works in a cycle of planning, implementing and reviewing. To help participants clarify what the Cambodian Learning Alliance could do, they were shown four questions to think about: 1) who to involve, 2) what topics they should learn about and share, 3) how to share within the Learning Alliance and 4) how to document for sharing with a larger number of partners.

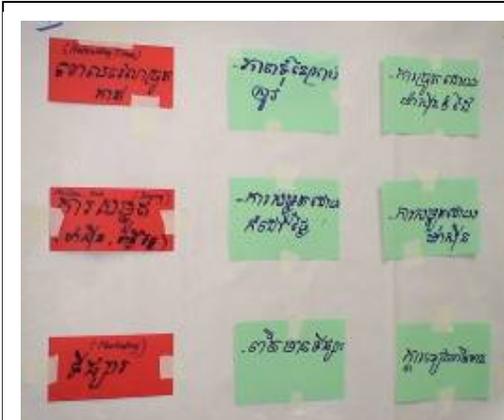
For the ‘who to involve’, the Learning Alliance would include all present Workshop participants as a start, and depending on what they want the Learning Alliance to do, other partners could be added later as needed. For topics, participants were guided through an exercise to help them prioritize topics based on needs. Participants were grouped according to province/location. (See Table 5 below.) Participants from Takeo and Kampot Provinces were merged into one group, making a total of 5 groups.

**Table 5: Regional Groups of participants for the first Learning Alliance activity**

Battambang	Prey Veng	Kampong Thom	Pursat	Takeo and Kampot
Seang Cheourth	Yous Mony	Ou Bos Phoan	Tith Sam Oeun	Nheb Srorn
Sier Kim Nay	Pin Channa	Hong Norn	Meus Seat	Chhay Sareat
Koul Savoeun	Pin Tara	Ek Sopheap (RUA)	Lim Thavy	Chan Chesda
Sun Try (DAE)	Im Sak	Vuthy	Nou Kim Sean	Vay Sarann
San Sovann	San Sarom	Lun Vanny	Chea Hong (DAM)	Sar Sophyreak (MAFF-DIC)
	Pich Sovanno, MAFF			Mr. Ho (MAFF-DIC)

#### 3.3.1 Group Activity – PH topics and solutions by region

Each group discussed and then wrote down on red cards three “top priority” postharvest needs or problems in their respective regions that they want the Learning Alliance to address. Each group then discussed and wrote down on a corresponding green card a postharvest-related technology or solution that would help address that particular need. (A list of technologies and postharvest practices from the previous PIPA Workshop OLM was displayed on a screen to facilitate discussion of needs and solutions.) Each group then placed their cards on “Top 3” needs and corresponding solutions on a flipchart for all participants to view. (See Figure 2 below as an example.)



**Figure 2: Group One’s activity results**

Red cards represent postharvest issues:

- 1) Harvesting time constraints (i.e., lack of labor, over-ripening)
- 2) Drying (wet paddy which farmers receive lowest prices)
- 3) Marketing (i.e., lack of information & exchange)

Green cards represent corresponding solutions:

- 1) Mechanical harvesting (e.g., reaper or mini-combine)
- 2) Mechanical dryer (e.g., flatbed dryer) & better sunlight drying
- 3) Market information and market boards

**Table 6: Summary of PH needs/solutions for all 5 regional groupings**

<i>PHT-Related Need</i>	<i>Possible Solution 1</i>	<i>Possible Solution 2</i>	<i>Possible Solution 3</i>
<b>Group 1</b>			
Cannot harvest rice on time (rice overripe)	Manual and mechanical harvesting		
Lack of flat bed dryer	Dry under sunlight	Set up flatbed dryer	
Market issue	Market information	Market board	
<b>Group 2</b>			
Market issue	Storing paddy until higher price - Cooperative	Tell farmers not to sell during low price or just after harvest	More support of agricultural products
No dryer	Set up dryer	Improve drying system	
Lack of labors and use of old-tools	Import machineries (combine harvester)	Training on how to use and maintain combine harvester	
<b>Group 3</b>			
Lack of knowledge on how to use harvester	Training course on how to use and maintain harvester		
Lack of harvester	Encourage traders to import (machines) and sell to farmers at low price		
Insect damage grain	Establish cooperative	Improve granary	Obtain support
<b>Group 4</b>			
No harvester	Hire a harvester from service providers	Borrow money from bank to buy a harvester	Import and sell combine to buyers with harvester with low price
No dryer	Contributing with IRRI to set up a flat bed dryer	Hire from service providers	
Lack of storage technology and commodity	Training by IRRI/MAFF on storage technologies	Sample granary	
<b>Group 5</b>			
Low prices of paddy	Provide low interest loans	Provide market information	Use seed variety that meets market need
High losses after harvest	Training on safe storage		
High losses during storage	Improve granary	Dryer	

### 3.3.2 Group Activity: Communication and documenting learning in the LA

For this activity, the regional groups brainstormed how they can share learning within the Learning Alliance, identifying what are the best ways to share, and suggesting how to document learning for sharing with other stakeholders.

**Table 7: Sharing and documenting in the Learning Alliance**

How can we share what we learn?	What is the best way to share?	How can we document our learning?
<b>Group 1</b>		
Call or SMS	Call/SMS	Publishing
Fax		Web-site
Internet		
Post		
<b>Group 2</b>		
Informal talks	Informal talks	Video
Meeting		Picture
Leaflet		
E-learning		
<b>Group 3</b>		
Posting information on board	Meeting/Discussing	Documenting
Demonstration		Magazine
Meeting		Video
Group Discussion		
<b>Group 4</b>		
Broadcast on radio	Coffee Table Talks	Documenting
Coffee table talks		Training
CD/VCD		
<b>Group 5</b>		
Radio, TV and Internet	SMS	Documenting
Training and demonstration		Web-site
SMS		
Key farmers		
Magazine		
Meeting or congress		
Information board		

Day 1 closed with a 'go-around' activity, whereby volunteer participants shared what was most important to them. Box 4 below details the notes from this activity.

**Box 4: Comments from the go-around activity**

- Seeing how to give everyone a clear understanding of the project and what is being done to transmit ideas from one head to another so that knowledge can be brought to end-users. It is also about finding ways to communicate and bring information to farmers.
- Learning that the needs of farmers are many.
- Seeing that to sustain the rice milling sector in Cambodia, good postharvest management must be done and later we can compete with other countries; need combine harvester because Cambodia faces problems on lack of labor; drying paddy in the sun is not suitable and storage is not proper in Cambodia. We participants are fortunate enough to learn about this.
- Learning to discuss more with Mr. Nou Kim Sean (another participant) because he has more experience (in drying and other technologies)
- We (extensionists) need to learn more first, we have to train ourselves.
- The main thing is that to transfer knowledge to many farmers we need a good (communication) strategy.
- Learning about the learning alliance was most important.
- How to share information with each other in a learning alliance, and what is a learning alliance.
- Learning not only how to share but also what to share; getting more experiences with others; different ways to share.
- Knowing what topics to share and how to share and also collect other ideas from others (private sector, province, ministry and village level).

## Day Two

Day two started with a recap of the activities from day one as reminder that this is a continuation of the Learning Alliance Meeting. Two general topics of high interest recurring to date and brought out during the previous day were tackled. These topics were how to develop business models and how to improve market information systems to support scaling up and scaling out of postharvest solutions.

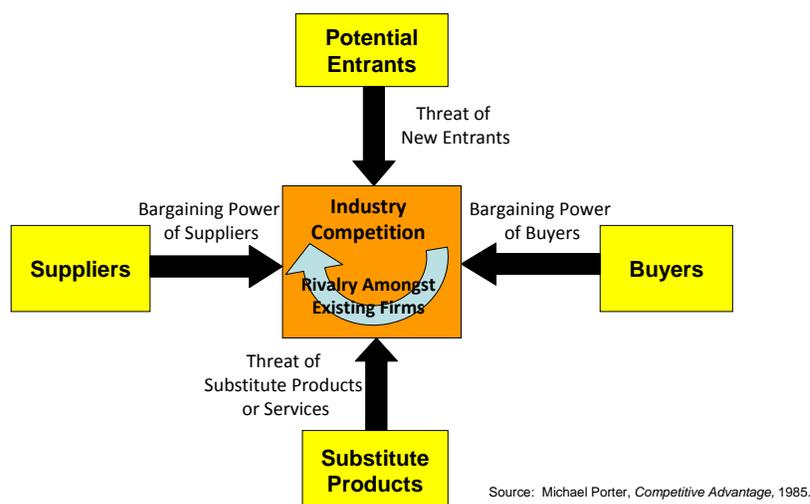
### 3.4 Session 4: Analysing Industry Structure & Attractiveness

Before simply embarking on a set of activities to promote new postharvest technologies, this session sought to orientate participants towards industry structure and marketability, rather than simply looking at technologies as “inputs” or “hardware” to be adopted by end-users, such as farmers. As such, this session sought to introduce a Five Forces framework to:

- Orientate participants to industry structure and market attractiveness – i.e., sustainability for a select postharvest technology.
- Uncover possible “weak points” in industry structure that affect successful introduction of a new technology.
- Provide starting point for thinking and developing effective strategies for incorporation into a business model/plan.

The Five Forces Model provides a “rapid assessment” tool for evaluating industry structure and attractiveness for virtually any product or service. In contrast to a limited “one dimensional” supply-demand model, this offers a “multi-dimensional” framework for revealing underlying structural weaknesses as well as potential opportunities. As such, this tool provides a framework for deeper thinking, not just about “hardware” for farmers, but how to address vital market issues for technology within a broader industry structure.

The Five Forces consist of 1) bargaining power of buyers, 2) bargaining power of suppliers, 3) threats of new entrants, 4) threat of substitute products, and 5) intensity of rivalry amongst existing players. In Five Forces analysis, these forces can be rated “high,” “medium,” or “low” and their determinants then examined to identify underlying structural weakness (as well as opportunities).



**Figure 3: Five Forces Model**

An earlier study<sup>1</sup> of a postharvest industry in Cambodia – mechanical threshers - was summarized using the Force Forces framework to show how problems underlying industry structure, if ignored, can potentially result in ineffective efforts and waste of resources when scaling out technologies in a marketplace.

### Box 2: Cambodia's Fledgling Thresher Industry

Mechanized threshing often marks the beginning of mechanization and increased needs for efficiency in rice production in agricultural countries that embark on a path of industrial development and increased urbanization. In Cambodia, the adoption of mechanized threshing technology, mainly from neighbouring Vietnam and Thailand, has proceeded in recent years. Rural workshops, particularly in Prey Veng and Kampong Province, where skilled machinists are particularly well regarded, have also begun fabricating local units of Vietnamese design. Initial industry assessment revealed that 47 rural manufacturers, supported by more than 100 component and material suppliers, employ several hundred new local workers. Despite relatively rapid industry development (or perhaps because of it), new threats to this fledgling industry are becoming increasingly severe. In 2007, initial assessment revealed the following constraints: 1) shortage of skilled labour; 2) rising input costs (i.e., mainly due to rising global steel prices); 3) shrinking profit margins; 4) poor quality fabrication; 5) seasonality of product sales (and thus high capital costs for production), all of which threaten this nascent industry.

The Five Forces Model provides a useful framework for identifying and analysing underlying industry structure. When we apply our Five Forces Model, here's what we find:

- |  |             |
|--|-------------|
| • <b>Threat of New Entrants?</b>         | <b>HIGH</b> |
| • <b>Threat of Substitute Products?</b>  | <b>HIGH</b> |
| • <b>Bargaining Power of Buyers?</b>     | <b>HIGH</b> |
| • <b>Rivalry Amongst Existing Firms?</b> | <b>HIGH</b> |
| • <b>Bargaining Power of Suppliers?</b>  | <b>LOW</b>  |

These extreme forces in industry structure generally reveal weakness in stability and health that underlie market issues. A Five Forces Model provides a framework for thinking and analysis (it's not a precision tool or computer), and allows further consideration of determinants or underlying factors before embarking on a set of activities which might have no effect and result in waste of resources, or worse, have detrimental impact by exacerbating existing structural weakness.

Our Five Forces analysis reveals that bargaining power of buyers (farmers) is high and that of suppliers (fabricators) is low. In a one-dimensional supply & demand economic model one might think this favorable to scaling out new technologies. However, our investigation revealed that industry structure was very weak and almost entirely price-driven with little or no differentiation in products or a supplier's value proposition. Thresher design from village to village, or even from workshop to workshop was basically "copied" (even product flaws got passed around this way). Some farmers saw fit to be present at a supplier's workshop during fabrication process (despite having limited fabrication knowledge) to observe fabrication to attempt to ensure a sufficient (though still relatively low) product standard. Thus farmers actually had little or no choice with regard to product design or quality – combined with other forces threatening the industry – was hardly something conducive to the development of a nascent agromachinery sector.

Moreover, other determinants, such as seasonal demand for threshers, contributed to industry difficulties as suppliers lacked access to operating capital. Lack of labor complicated supply further, and uneven seasonal production meant workers could not be easily retained from season to season, something which greatly contributed to quality problems. Trainees sometimes left to set up with own businesses in the vicinity further aggravating the problem of a price-driven industry struggling with product acceptance. As a result, fabricators became extremely cautious and defensive about working with others and rivalry amongst existing actors was deemed extremely high making strategies to develop the sector further very difficult.

Further analysis of determinants allowed us to separate "causes" from "effects". The two main determinants of structural weaknesses in the industry boiled down to:

1. Thresher demand is near entirely price-driven (i.e. commodified) as current products lack differentiation or points of value that better satisfy farmers' demands and needs.
2. Seasonal demand (& thus instability in the work force) is a major factor contributing to poor quality fabrication.

This helps explain the industry's precarious position, one that activities or interventions would not likely have proven effective unless carefully targeted to address these structural challenges. On the surface, the industry looks attractive to new entrants – easy to get into, few market barriers, and an expanding sector projected to grow at least 10% year-on-year annually. Our analysis may perhaps make a potential new entrant think twice.

However, it is important to note Five Forces Analysis works both ways. While revealing underlying structural weaknesses in an industry, it also can underscore opportunities if new or existing players adopt strategies aligned to overcome existing structural weaknesses. For example, if a player developed a new or suitably differentiated product, and diversified his/her business into complementary products to stabilize the firm's work force and operational structure, this could become a significant opportunity indeed, one that could then positively (and reversely) impact back upon industry structure, making it stronger, more viable, and sustainable by providing farmers with better solutions.

Each regional group was invited to evaluate their “Top 3” postharvest technologies using the “Five Forces” framework. Each group drew a generic Five Forces Model on a flip chart and discussed how to rate each of the five forces for a particular postharvest technology. Participants then asked themselves “why?” they rated the forces as such to flush out underlying factors (or “determinants”) that they then wrote down next to each rating. Finally, each group presented their analysis of their select technology to the wider group.

All groups were successful in their analysis and presentation. (See Appendix 4 for summary each regional group’s analysis of a technology.) Below is one group’s analysis for mechanical dryers, which highlights the strong potential and viability of this technology from the standpoint of industry structure and attractiveness:



**Figure 4: Five Forces Model - mechanical dryer**

Group 2’s analysis for locally-made mechanical rice dryers. Instead of simply looking at technology as hardware, Five Forces Analysis provides a “rapid assessment” of industry structure and viability.

Here we see potential for developing dryers as “high” (highly viable and attractive from an industry standpoint). Relative low competition, threat of new entrants, and substitute products make this technology attractive for a potential fabricator to meet emerging demand for drying services from farmers/millers/traders.

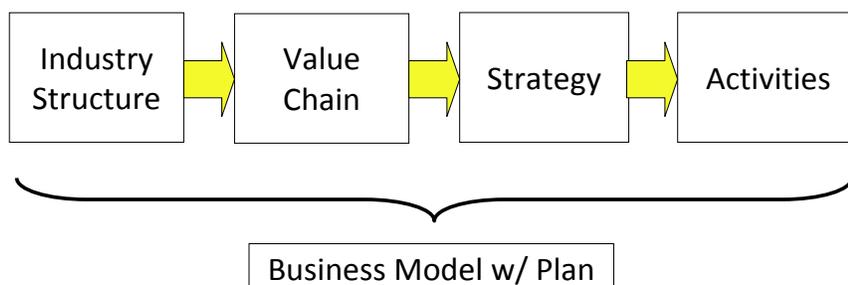
At the end of this session, some active discussion emerged. Comments included:

- “This is the first time I have been exposed to tools for market analysis, something we need to learn more about.”
- “The morning helps us make good decisions before we go out and do something.”
- “Dryers have the most attractive potential for my region. I am anxious to get started.”
- “The situation of thresher industry in Cambodia was most interesting. I previously saw firsthand many problems but lacked a way of understanding the ‘real causes’.”
- “As farmers, this helps us understand what forces are present in our own business (rice production) that we must deal with.”
- “The topic presented was new to us and we need to learn more new things.”

### 3.5 Session 5: Road Map to Business Model Development

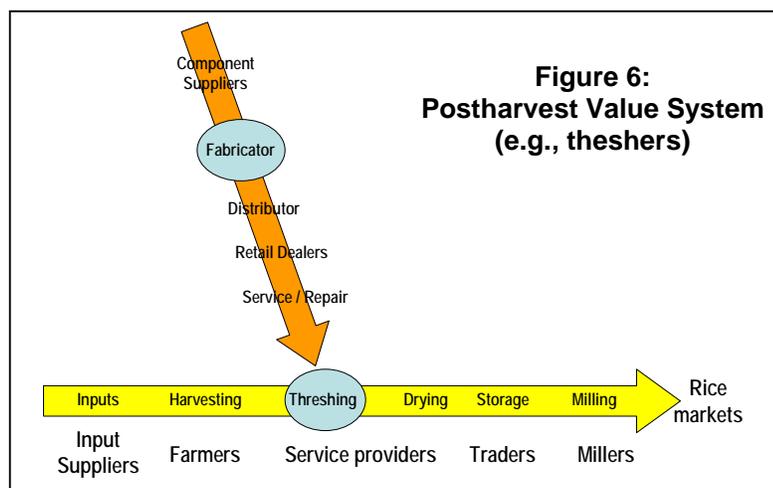
As industry analysis is only a first step to developing an effective business model, this next session briefly outlined other components:

**Figure 5: Road Map to a Business Model**



Next steps would involve assessing value chains (industry and sub-sector level), then devising strategies and activities (firm level) as part of an overall business plan. There was general agreement that they needed more knowledge of business and market research tools for scaling out postharvest technologies, as well as greater participation from the private sector, issues that are potential next steps for the Learning Alliance on a regional level.

The following slide highlights the need for value chain analysis. This slide depicts players in the rice production chain who would use or benefit from services a postharvest technology would provide, while also depicting the “extended” value chain for a technology. Both value chains must function effectively in order to deliver suitable technology of sufficient quality to end-users, in what is called a *value system*.



This session did not go into further detail or additional activities, but simply provided the above as a backdrop for discussing potential needs and next steps for the Learning Alliance.

#### 3.5.1 - Group Activity: Questionnaire on morning sessions 4 & 5

Participants were then asked to write down their responses to two questions: 1) “What did you consider most important about this morning’s session?” and 2) “How can you go about applying it?” (See Appendix 5 for a summary of participant responses.)

### 3.6 Session 6: Market Information Systems and Market Boards

The other major topic tackled on day 2 was how to scale out and make a rice market information system sustainable in Cambodia. Dr. Meas Pyseth provided background information on the market information system that had been piloted during the previous ADB-JFPR Project phase. The main purpose for establishing village market information boards would be to strengthen the bargaining power of farmers in making sales decisions, when, to whom, and where to sell their harvested paddy.

In the previous project phase, a small board was set up in each of eight target villages in Battambang and Prey Veng Provinces. Market information on various regional buyers and prices for rice was provided monthly by a local Project consultant to key farmers who then updated the village market board. During his visit in late 2006, Ian Makin of ADB suggested the Project utilize mobile phones to send rice market data to key farmers in the villages. As such, rice market information was collected from different markets by a Project consultant and provincial counterparts and communicated by mobile phone to key farmers who then updated the boards every 3 days. In March 2007, after joining a field day exercise to evaluate mini-combine technology in Prey Veng, Mr. Jon Cook of ADB suggested placing a (second) bigger board in each target village for greater utility. Thus in addition to rice market information, these boards displayed graphs that depicted the fluctuation of grain prices throughout previous years, along with project information on postharvest technologies, local announcements, and other information from villagers.

Following the Workshop, it is noteworthy that farmers in Porchrey village in Prey Veng Province were observed by Rica and Trina to be maintaining a market information board supporting by a local cooperative. Some traders and farmers visiting outside areas brought updated information back. Other farmers elsewhere had tried to maintain boards in their villages but lacked a sustainable mechanism and provision of market information from outside their villages. A topic for the Learning Alliance may be to investigate ways to sustainably build upon the initial pilot effort.

Hence, the current Project Team identified three key questions for workshop participants to discuss and suggest ideas for:

1. How to raise awareness of a market information board in a village?
2. How to encourage actors in the previously piloted market information system to become active again?
3. How to find (sustainable) funding for the market information system.

Workshop participants were divided into three groups to have a learning alliance café discussion on the above three questions. The results of their discussions are summarized below.

#### Group activity 3.6.1: LA café discussion on MIS

##### **Question 1: *How to raise awareness on the market information board in the village?***

- Place a board in a crowded place.
- Select the right person who can manage the board.
- Provide training on market information and its use to key farmers and villagers.
- The price on a board should be useable and updated.

- Post the prices of grain at different markets.
- Along with market information, post other useful information.
- Have a good relationship with authorities to put up and maintain the board.
- Political party-related information should not be allowed to be posted.
- Decorate the board to be attractive.

**Question 2: How to make people in charge/involved be active again?**

- Place market information on a board and update every 3 days.
- Place the board in a crowded place.
- Select/establish a group to maintain/be in charge of the board.
- Encourage or provide incentives.
- Explain/make villagers know the usefulness of the board and information.
- Have some resources to operate.

**Question 3: How to get budget?**

- Donor: ADB, WB, IRRI
- Government
- Next activity for the project
- Cooperative

All agreed that the market information boards were useful and provided farmers with helpful information that they valued. The critical issue being how a village can help support such an effort and keep it going for scaling out elsewhere (for example, by engaging a miller, trader, farmer cooperative, etc, who has an interest in creating and maintaining a market board.) It also appears that market information boards could more sustainably be promoted alongside other postharvest activities (not just stand alone), say for use with introduction of flat bed dryers.

### **3.7 Session 7: Next Steps for the Learning Alliance**

Our Postharvest Project counterparts in Viet Nam, Dr. Phan Hieu Hien from NLU and Dr. Tan Van Pham of SIAEP were invited to attend this workshop to learn more about business models (a topic that may apply equally to Viet Nam) and to share with the group their approaches to the Learning Alliance and postharvest needs in their country. Dr. Hien presented (see PowerPoint slides in Appendix 6) how Viet Nam has “regionalized” the Learning Alliance concept to address postharvest needs which differ somewhat from region to region. Viet Nam has been sub-divided into key regions and has proposed field trips and pilot sites while suggesting value chain analysis and business models become key topics for the Learning Alliance in forthcoming activities.

While postharvest needs and approaches may differ somewhat between countries, the participants welcomed the information and opportunities for additional cross country learning.

Lastly, Dr. Pyseth lead a brief plenary discussion on next steps for the Learning Alliance. It had been an eventful two days with many activities and new ideas shared. Participants were keen and enthusiastic with feedback throughout the Workshop so the Plenary remained brief. With these existing Workshop outputs, the Team concluded that IRRI and the Cambodia Project Team could provide further direction until the Learning Alliance “takes hold” and can be driven locally.

During the Workshop, several key points emerged from participants that may be next steps for the Learning Alliance:

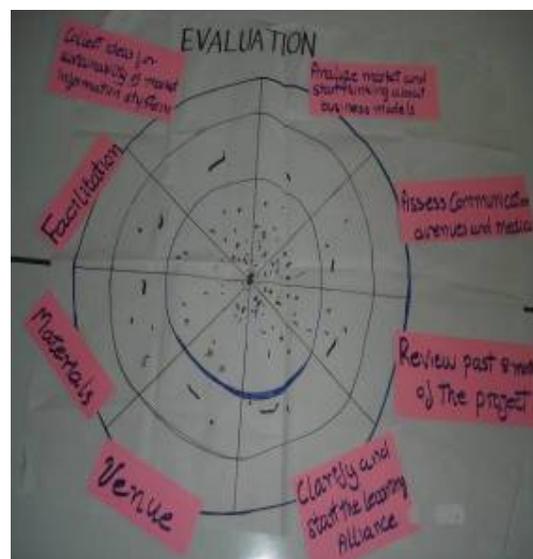
- Need for additional market analysis for participants' priority technologies (dryers, hermetic storage, etc.) that could lead to the creation of business models and a plan in each region.
- Need for more analysis of the rice production industry. Some participants, especially farmers, found market analysis useful to their activities in the rice market.
- Making the market information system from the previous pilot project active again by trying out ideas put forward in the LA café activity. As farmers in one village had continued the market information board, the Learning Alliance could also investigate further ways to sustainably scale out the initial pilot effort.
- Establishing topic working groups within the Learning Alliance for activities in a particular area.
- Using upcoming activities such as the Project inception meetings in villages to canvass additional information on priorities and ideas at the village level (e.g., MIS?).

### 3.8 Workshop Evaluation

The Workshop finished with a “dartboard” evaluation. Each quadrant represented a specific Workshop criteria and each concentric circle represented how close we came to achieving the center. Overall, 81% of participants felt the set of criteria were hit in the center circle, 19% in the middle circle, 0% in the outer circle.

**Figure 7: Dartboard Evaluation of Workshop**

1 = Outside 2 = Middle; 3 = Right on target	PHNOM PENH 7-8/09/2009		
	1	2	3
• Analyze market and start thinking about business models	0	1	14
• Assess communication avenues and media	0	3	12
• Review past 8 months of the project	0	4	12
• Clarify and start the learning alliance	0	3	12
• Venue	0	2	9
• Materials	0	4	7
• Facilitation	0	2	5
• Collect ideas for sustainability of market information system	0	1	14
<b>TOTAL</b>	0	20	85
<b>%</b>	0	19	81



# **Appendices**

**Appendix 1: Workshop Agenda**

**Workshop Agenda**

**First Postharvest Learning Alliance Meeting**

**Topics:**  
**“Market Assessment and Communications Strategies”**

***Bringing about a Sustainable Agronomic Revolution in Rice Production in Asia by Reducing Preventable Pre- and Postharvest Losses***

7-8 September 2009  
 Ministry of Agriculture, Fisheries, and Forestry (MAFF)  
 Phnom Penh, Cambodia

**Day One**

Welcome Address	<i>45 minutes</i>
Workshop Objectives & Agenda	<i>30 minutes</i>
<b>Session 1: PH Project Update</b>	<i>60 minutes</i>
<i>Morning Break</i>	<i>15 minutes</i>
<b>Session 2: Communication Needs &amp; Strategies</b>	<i>60 minutes</i>
<i>Lunch</i>	<i>90 minutes</i>
<b>Session 3: Learning Alliance Needs &amp; Priorities</b>	<i>90 minutes</i>
<i>Afternoon Break</i>	<i>15 minutes</i>
Session 3 (cont'd): Communicating as a Learning Alliance	<i>60 minutes</i>

**Day Two**

Welcome to Day 2!	
<b>Session 4: Analyzing Industry Structure and Sustainability</b>	<i>90 minutes</i>
<i>Morning Break</i>	<i>15 minutes</i>
<b>Session 5: Developing a Road Map to Business Plans</b>	<i>90 minutes</i>
<i>Lunch Break</i>	<i>90 minutes</i>
<b>Session 6: Market Information Systems and Exchange</b>	<i>90 minutes</i>
<i>Afternoon Break</i>	<i>15 minutes</i>
<b>Session 7: Plenary Session – Next Steps</b>	<i>60 minutes</i>
Workshop Evaluation	<i>30 minutes</i>



**Appendix 2: List of Participants**

No.	Name	Title	Organization
<b>I. MAFF Departments</b>			
1	H.E Sen Sovann	Deputy Secretary General	MAFF
2	Mr. Pech Sovanno	Deputy Director General	MAFF
3	Dr. Mao Sophearet	Director	Agro-Industry Dept, MAFF
4	Mr. Kim Chhi Sophal	Staff	Ago-Industry Dept, MAFF
5	Mr. Bun Radar	Deputy Director	International Cooperation Dept, MAFF
6	Ms. Sar Sophyreak	Staff	International Cooperation Dept, MAFF
7	Mr. Ty Bona	Staff	International Cooperation Dept, MAFF
8	Mr. Chhin Senghor	Staff	International Cooperation Dept, MAFF
9	Mr. Nhem Sokha	Deputy Director	Agricultural Machinery Dept, MAFF
10	Mr. Chea Hong	Staff	Agricultural Machinery Dept, MAFF
11	Mr. Mak Soeun	Director	Agricultural Extension Dept, MAFF
12	Mr. Sun Try	Director	Agricultural Extension Dept, MAFF
13	Mr. Ty Channa	Staff	CARDI
14	Mr. Ek Sopheap	Teacher	Royal University of Agriculture (RUA)
<b>II. PDAs</b>			
15	Mr. Tith Sam Oeun	Head	Pursat Provincial Dept of Agriculture
16	Mr. Meas Seth	Staff	Pursat Provincial Dept of Agriculture
17	Mr. Ou Boss Phoan	Head	Kampong Thom Provincial Dept of Agriculture
18	Mr. Hong Norn	Staff	Kampong Thom Provincial Dept of Agriculture
19	Mr. Yous Mony	Head	Prey Veng Provincial Dept of Agriculture
20	Mr. Pin Channa	Staff	Prey Veng Provincial Dept of Agriculture
21	Mr. Nheb Sronn	Head	Takeo Provincial Dept of Agriculture
22	Mr. Chhay Sareth	Staff	Takeo Provincial Dept of Agriculture
23	Mr. Chan Chesda	Head	Kampot Provincial Dept of Agriculture
24	Mr. Vay Sarann	Staff	Kampot Provincial Dept of Agriculture
25	Mr. Seang Choeurth	Deputy Head	Battambang Provincial Dept of Agriculture
26	Mr. Siea Kimnay	Staff	Battambang Provincial Dept of Agriculture
<b>III. Private sector and others</b>			
27	Mr. Nou Kim Sean	Miller	Director of Pursat Millers Association
28	Mr. Lim Thavy	Miller	Pursat Millers Association
29	Mr. Kul Savoeun	Farmer	Battambang Province
30	Mr. Im Sak	Farmer	Prey Veng Province
31	Mr. San Saran	Farmer	Prey Veng Province
32	Mr. Pin Tara	Teacher	Chea Sim Kamchay Mear University (CSKMU)
<b>IV. Project Team</b>			
33	Dr. Meas Pyseth	Consultant	IRRI/MAFF
34	Mr. Sorn Vichet	Consultant	IRRI-Project
35	Mr. San Sovann	Consultant	IRRI-Project
36	Mr. Has Vuthy	Assistant	IRRI-Project
37	Mr. Lun Tharin	Assistant	IRRI-Project
38	Mr. Lon Vanny	Assistant	IRRI-Project
39	Ms. Marie Kimleang	Administrator	IRRI-Cambodia
<b>V. Vietnam Project Guests</b>			
40	Dr. Phan Hieu Hien	Lecturer/Researcher	Nong Lam University
41	Dr. Tan Van Pham	Vice Director	SIAEP
<b>VI. IRRI</b>			
42	Alfred Schmidley	Business Dev. Specialist	IRRI
43	Trina Leah Mendoza	IRRC-CU	IRRI
44	Rica Joy Flor	IRRC-CU	IRRI

**Appendix 3: Photos of Postharvest Activities to Date**



Project Planning Meeting, Takeo Province, 27 Feb 09



Baseline Survey in Kampot Province, March 09



Course: PH technologies, key farmers, MAFF, 4-6 July 09



Course on PH technologies for PCs, MAFF, 27-30 June 09



Postharvest course for provincial counterparts in MAFF, 27-30 June 09



Postharvest course for key farmers, held MAFF, 18-20 July 09

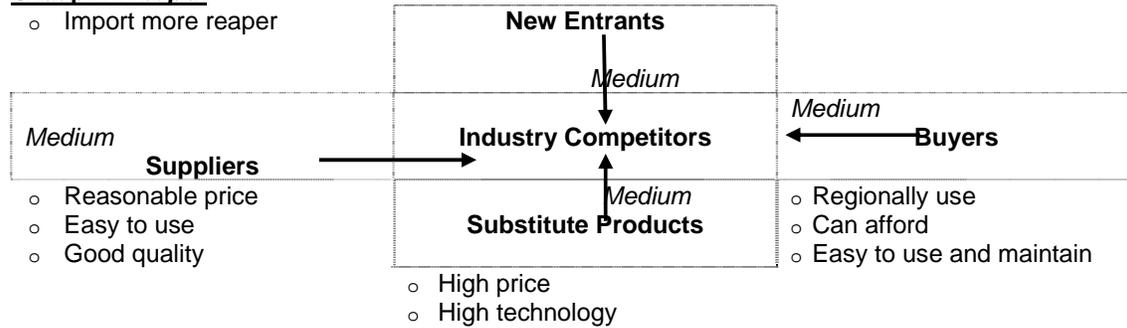


Above two photos are of training courses on how to reduce grain losses after harvest conducted by Kampong Thom PDA in close collaboration with Project Team, Aug to Sept 2009.

**Appendix 4: Summary of Five Forces Analysis for a PH Technology**

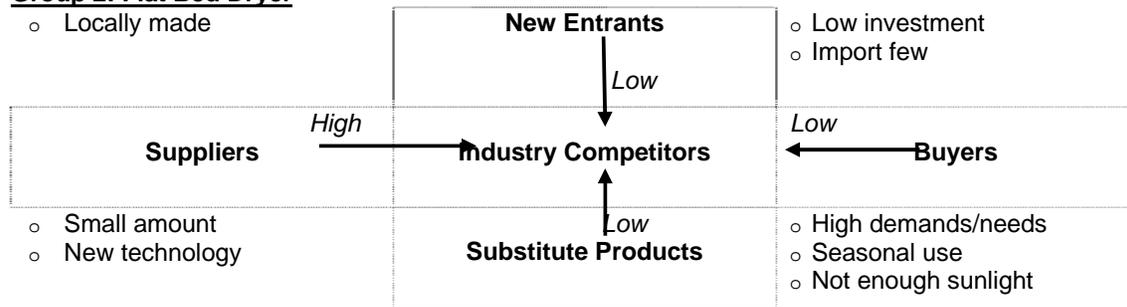
**Group 1: Reaper**

- o Import more reaper



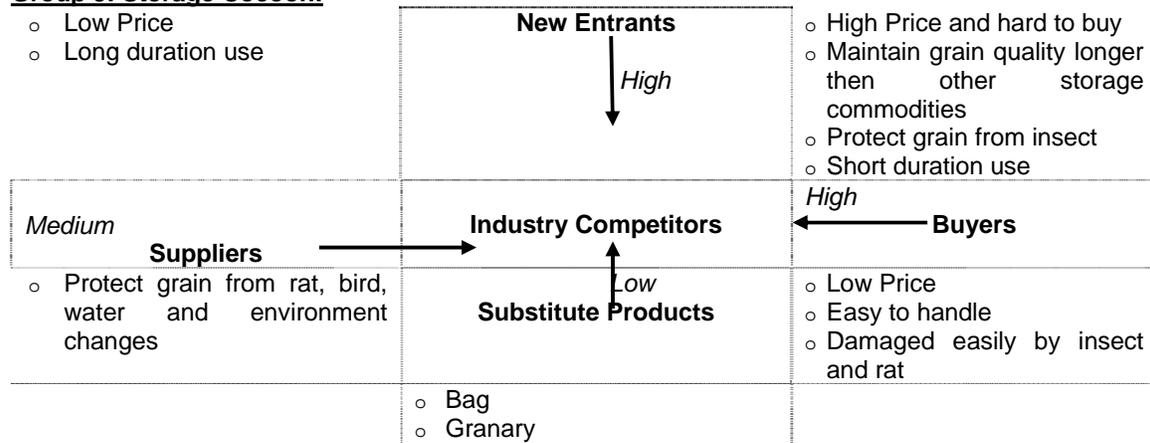
**Group 2: Flat Bed Dryer**

- o Locally made



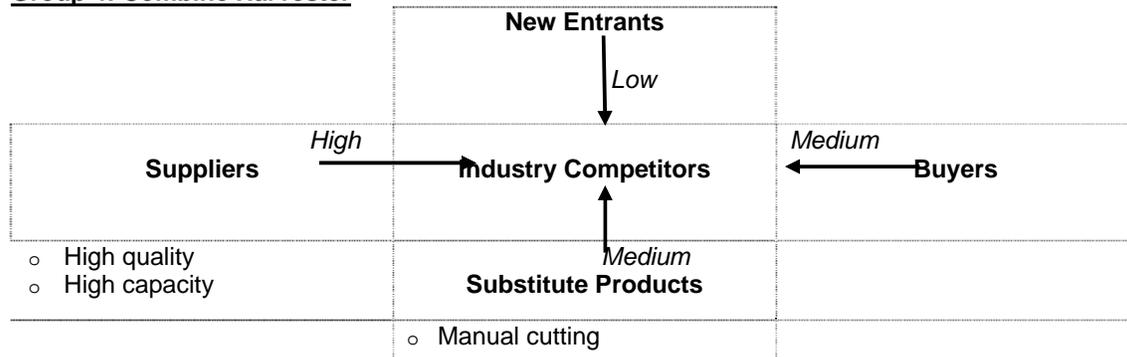
**Group 3: Storage Cocoon:**

- o Low Price
- o Long duration use

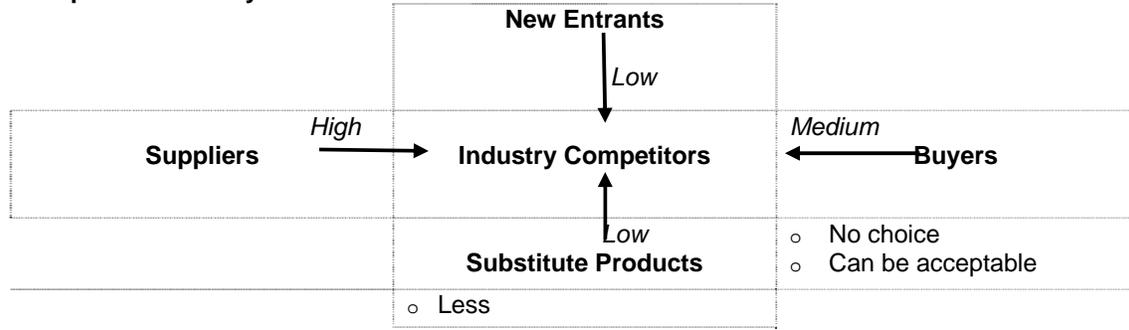


**Group 4: Combine Harvester**

- o High quality
- o High capacity



**Group 5: Flatbed Dryer**



**Appendix 5 – Summary of participant responses for Sessions 4 & 5**

<b>What did you consider most important about this morning's session?</b>	<b>How can you use this knowledge?</b>
Information how to sustainably implement new technology	Before starting an activity, knowing what to do first. Helpful to me to make good decision-making.
Analysing and getting more information on market structure for rice dryers	Use knowledge to help analyse business in postharvest
Analysing industry for rice dryers	Commit to learn more about postharvest industry using 5 Forces and convey needs to officials of MAFF to farmers who are going to do business
Analyse business to make rice dryers	Transfer knowledge to farmer and extension
Analysis of safe storage practices & technologies	Transfer knowledge to farmers and officials
Information on marketing information services	Gather needed knowledge which will apply to stakeholders
understanding Attractiveness and 5 Forces of Industry	Use this knowledge to help make basic strategy for business plan
How to achieve market sustainability through Five Force analysis	I will provide this knowledge to my students and use this tool for analysis while I have plan to develop a business.
Application of Five Forces to analyse industry structure and understand weaknesses	Rectify and modify storage practices for rice
Analysing market for postharvest technologies	Apply this knowledge to dryer and safe storage
Five Forces that can be used to understand industry structure	Apply this knowledge to rice business
Five Forces Model for market assessment	Use this analysis to pilot one dryer to use in this market
Five Forces tool	learn how to investigate new market entrance; learning more about products, quality, and attracting buyers
Identifying postharvest technologies and how to do business	More workshops, know what market info is needed; apply to spare parts, producers, suppliers, services
Adoption of new technology by farmers (how to impact)	learning more about market tools
Applying Five Forces Tool to understanding my work in rice industry	How to compete in industry through good rice production for world market
Evaluate market structure for production (of rice and machines)	Investigate how to transfer new technology mini-combine so we can use in Cambodia; investigate strategy and technology for safe storage, competing on quality in global market
Analyse market value and operation of value chain, how industry weakness occurs, how to find solution when we meet obstacle	Apply 5 Forces to strategies for market for suppliers and buyers
Market information from Five Forces model for analysing a individual situation	Gain bargaining power
Analysis of Cambodia's thresher industry	Use for farmer decision, analyse what we need to do and what we don't need to do; find weakness in service operation by careful evaluation of proposed idea for technology.
Five Forces analysis	Extension and training on PH technology and market structure in my region, show how to analyse each point
How Five Forces analysis works	
Better understanding rice market structure and need for better quality	
Analyse market structure for combine harvesters using 5 Forces model	

### Appendix 6: Cross-country Learning: The Learning Alliance in Viet Nam (select slides presented by Dr. Hien)

**VIETNAM**

- Population: 86 million
- Paddy (2008): 37 million ton
- 50% in the Mekong Delta (20% population)
- 50% in 7 other ag. regions (80% population)

5 Regional Workshops

Ha Noi

Hue

Nha Trang

My Tho

Can Tho

> 2000 km

PIPA National Workshop Vung Tau

Methodologies and results formats: Similar to Cambodia, Philippines.

- Problem tree
- Network maps
- Learning Alliance
- Outcome Logic Mc

- NEXT STEPS

**3. HUE**

**Proposed Activity: Field visits**

- Especially in the Central and Northern areas.
- Create awareness and willingness to apply if their similar conditions are fitting.
- Good platform for the Learning Alliance to start the post-harvest activities in their local areas
- Travel distance preferably less than 50 km

**Proposed Activity: Pilot sites development**

- To establish more pilot sites of **existing technologies** across the country for **easier field visits**
- Parallel purpose **for researchers** in adjacent Universities or Institutes or Extension staff to gather new experimental data for enriching the database, while building the capabilities of local people

- Proposed: 40 sites for hermetic storage
- 3 drying sites
- 5 laser leveling sites

WHY?

**Pilot sites development: Dryer**

- Flat-bed dryer: From ≈ 0 in 1980
- to **6000 units in Mekong Delta in 2007.**
- **Research-Extension circle**
- **Latest model: (Since 2001)**
- **Reversible FBD (600 units in 2007)**
- **But... other Regions: Lack of Dryers**

REVERSIBLE SRA DRYER Floor: 25 sqm / 8 ton

**Cross Country Learning**

- **POST-HARVEST LEARNING ALLIANCE**
- **LEARN and SHARE**
- **with the PHILIPPINES and CAMBODIA**

**Appendix 7 – List of Abbreviations**

ADB	Asian Development Bank
CSKU	Chea Sim Kamchaymea University
DAE	Department of Agricultural Extension, MAFF, Cambodia
DAM	Department of Agricultural Mechanization, MAFF, Cambodia
IRRC	Irrigated Rice Research Consortium
IRRI	International Rice Research Institute
LA	Learning Alliance
MAFF	Ministry of Agriculture, Forestry, and Fisheries, MAFF, Cambodia
MIS	Market Information Systems
NLU	Nong Lam University, Ho Chi Minh City, Viet Nam
OLM	Outcome Logic Model
PDA	Provincial Department of Agriculture, Cambodia
PH	Postharvest
PIPA	Participatory Impact Pathway Analysis
SIAEP	Southern Institute for Agricultural Engineering and Postharvest, Viet Nam