

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**MINISTRY OF COMMERCE**

**MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES**

**ROYAL GOVERNMENT OF CAMBODIA**

**THE STUDY ON  
IMPROVEMENT OF MARKETING SYSTEM  
AND  
POST-HARVEST QUALITY CONTROL OF RICE  
IN CAMBODIA**

**FINAL REPORT  
(MAIN REPORT)**

**SEPTEMBER 2001**

**OVERSEAS MERCHANDISE INSPECTION CO., LTD.  
SANYU CONSULTANTS INC.**

## Composition of Reports

<u>Report</u>	<u>Language</u>
Main Report	Japanese
Main Report	English
Main Report	Khmer (unofficial translation)
Supporting Report	English

## Currency Equivalent (as of January 2001)

1 US Dollar = 3,850 Riel = 117 Japanese Yen

## PREFACE

In response to a request from the Government of Cambodia, the Government of Japan decided to conduct the Study on Improvement of Marketing System and Post-harvest Quality Control of Rice in Cambodia and entrusted the study to Japan International Cooperation Agency (JICA).

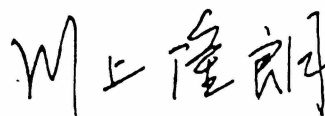
JICA sent to Cambodia a study team headed by Mr. Isamu YAMAZAKI, Overseas Merchandise Inspection Co., Ltd. between April 2000 and July 2001.

The team held discussions with the officials concerned of the Government of Cambodia, and conducted field surveys in the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relationship between our two countries.

I would like to express my sincere appreciation to the officials concerned of the Government of Cambodia for their participation during the Study period.

September, 2001



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Takao KAWAKAMI  
President  
Japan International Cooperation Agency

September 2001

Mr. Takao Kawakami  
President  
Japan International Cooperation Agency

Dear Sir,

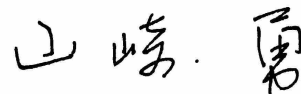
### Letter of Transmittal

We are pleased to submit the final report for the Study on Improvement of Marketing System and Post-harvest Quality Control of Rice in Cambodia. This report presents the result of all works performed in both Cambodia and Japan during the period of March 2000 to August 2001.

Rice production is the basic sustenance for farmers who are majority of the country, and the most significant industry for the prospective development of society and economy in Cambodia. The Study proposes various development projects for improving the marketing system and post-harvest practices of rice. Through the improvement in the quality of rice and modernization of the marketing system, these projects aim at the final goal of “strengthening of food security” and “development of rice industry”, and contribute to the improvement in income of the farmers. Hence, we wish the projects to be implemented as earlier as possible.

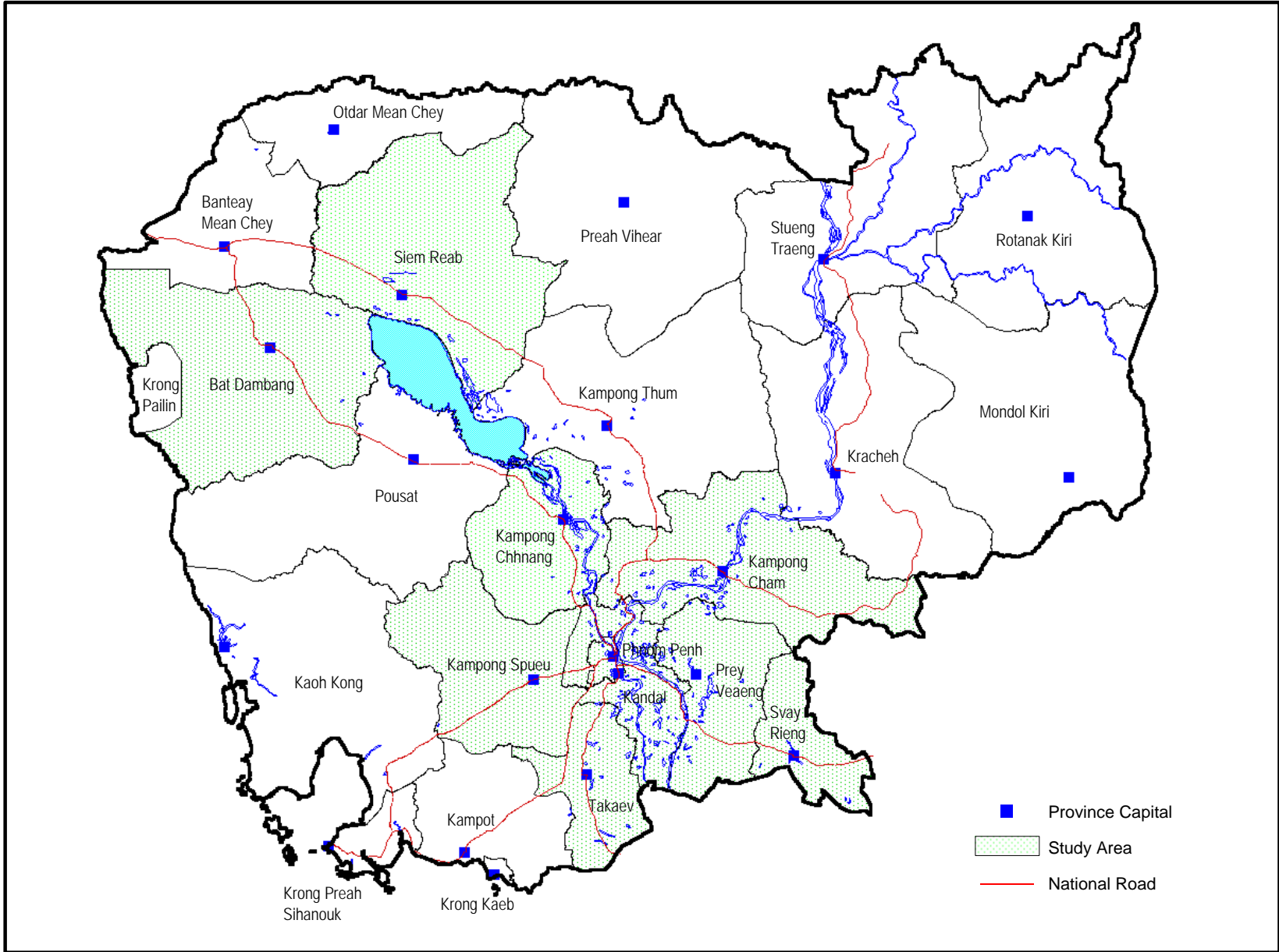
We wish to express our sincere gratitude to the officials concerned of your agency, the concerned Ministries, the Embassy in Cambodia of the Government of Japan for their valuable advises and cooperation extended to our team. We are also grateful to the officials of the Ministry of Commerce, the Ministry of Agriculture, Forestry and Fisheries of the Royal Government of Cambodia and other authorities concerned for their cooperation and assistance extended to us in the course of our works in Cambodia.

Very truly yours,



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Isamu Yamazaki  
Team Leader  
The Study on Improvement of  
Marketing System and Post-harvest  
Quality Control of Rice in  
Cambodia



## Post-harvest practices in the Village (harvesting ~ drying)



Harvesting is done manually. No harvesting machine is introduced yet.

Joint work, in the form of labour exchange, is widely practiced for harvesting.



### Mechanical threshing

Threshing take place either at paddy field or backyard. Vietnam made thresher is very popular.

Loss is mostly caused by failure of grain separation from straw.



### Manual threshing ( above ) by foot-treading ( below ) by board-beating

Board-beating is widely practiced than foot-treading.

Loss is mostly caused by scatter and board-beating generates more loss.



### Removing foreign matters

Gravity separation using natural wind and bamboo colander to remove foreign matters, immature grain, etc.

No winnower equipped with fan is used.



### Sun drying

Although moisture contents is checked based on farmer's experiences, over drying and/or moisture absorbing during the sun drying results the cracked grain.

Periodical turn-over of grain is not always practiced. This may be because of the small quantity of drying paddy.

In the farmers level post-harvest practices, largest proportion of loss occur during harvesting, manual threshing and storing.

Traditional varieties used for wet season crop have many easy-shattering type. Compare to IR varieties used for dry season crop, 2 times loss in harvesting and 4 times loss in transporting from field to backyard were surveyed.

## Paddy storage in the Village



Bulk storage Siem Reab province



Bag storage Takaev province

There are two methods in paddy storage in the villages ; i) bulk storage and ii) bag storage. Bulk storage is practiced nationwide. Typical storage is constructed with palm-woven mat on the floor/side wall and it is located independently or under the floor of farmer's house. About two tons of paddy is storable. Bag storage is major method in Prey Veang province and some part of Takaev province and Kandal province. PP bags are kept in the house or under the floor.

## Custom milling in the Village



Engerberg type



Compact type



Custom mill-cum-Commercial mill

Custom milling provide a milling service to villagers and receive by-products (bran and/or small broken) in return.

In the northwest region such as Bat Dambang, combining function of custom milling and commercial milling is often observed. Many of custom mills were installed after 1995, and the number of mills is still increasing.

Majority of milling machine are Engerberg type and Compact type (rubber roll husker with a common base). Custom mill-cum-commercial mill equip with Small plant type (rubber roll husker + friction type mill).

According the questionnaire survey, average processing capacity is 0.3 ton/hr., processing volume is 67 ton/year.

## Commercial Milling



Large scale mill in Bat Dambang

Typical commercial mill is a plant type composed of following equipment:

1. Pre-cleaner (shifting type), 2. Husker,
3. Paddy separator, 4. Whitener,
5. Grader, 6. Scale, 7. Packing machine

Vietnam made equipment are widely used. Many large scale mills are located in the northwest region such as Bat Dambang province.

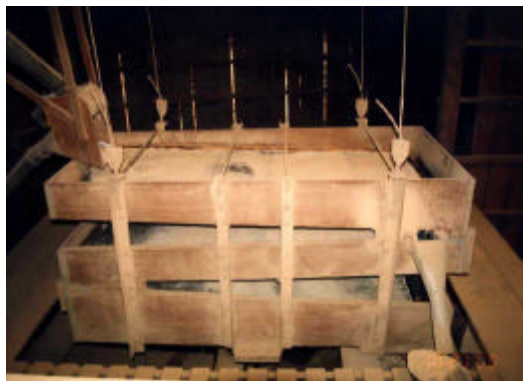


Stone type whitener (Milling machine)  
Majority are 2-stage to 4-stage



Rubber roll husker and Paddy separator

Rubber roll husker is becoming more popular because less generation of broken rice. But husking ratio is low in 50-60%.



Grader

Need to improve the efficiency in broken grain separation by enlarging the sieve space and preventing the clogging.



Length Grader

Still new equipment in Cambodia and only limited number of mills have introduced it. Proper usage is not understood in some mills.



Equipment for Quality inspection

Equipped with a few large-scale mills

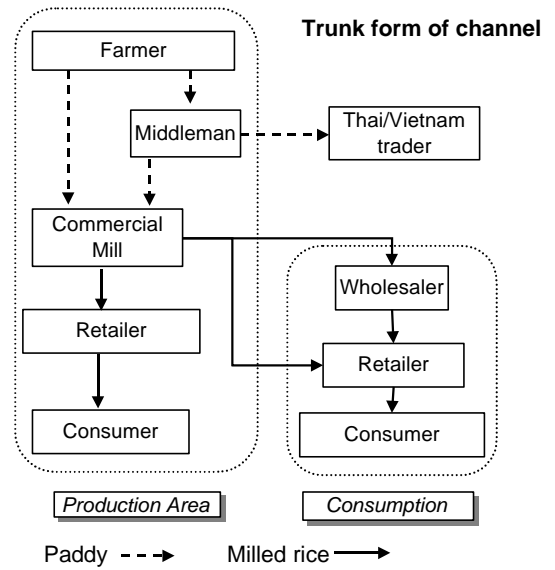


## Mode of Paddy/Rice Marketing

Under the market economic policy, rice/paddy marketing is entrusted entirely in the hand of the private sector and various marketing channels are formed.

The number of farmers involved in the marketing system is limited. According to the questionnaire survey, only 40% of farmers sold rice, regardless of quantity, during the last 2 years. Average sales volume is 1.6 ton/year and maximum is about 3 ton/year. Most farmers (67%) farmers sell surplus paddy to middleman.

Middlemen play an important role in the marketing of farmer's paddy, especially in remote areas far from rice mills, markets or towns. Large-scale middleman uses agents to visit individual farmers and buy paddy.



### Paddy Collection



Paddy sales by farmers and middlemen at rice mill Svay Rieng province (Jan. '01)



Paddy collection at rice mill Prey Veang province (Jan. '01)



Paddy sales by farmer with hired truck, at rice mill Siem Reab province (July '00)



Paddy collection at rice mill same as the above

## Mode of Transportation

Most of paddy and rice is transported by road. Various means, such as heavy truck, tractor, motorcycle and ox-cart, are used depending on distance and road condition. Regular use of waterway transportation is limited to some areas, such as paddy transport to the rice mills in Peam Ro in Prey Veang Province, paddy transport to Vietnam and rice transport to Kratie from Kompong Cham town.



Local made truck used by middleman  
Bat Dambang province



Paddy sales by farmer  
Peam Ro, Prey Veang province

## Milling and Shipment to towns



Commercial Mill Siem Reab province

Among the marketing agents, commercial rice mills have a largest business scale and play a role of financial supplier to other agents; making advance payments to middlemen and deferred payments to rice sellers.

They also play an important role in paddy storage.

Many of commercial rice mills have regular business relations with middlemen. Rice millers order a specific variety of paddy to middleman when they receive a large or urgent order.



Shipment of milled rice from mill  
Bat Dambang province



Truck arrived at rice shop  
Kampong Cham province

## Rice Distribution in towns

There are two types of rice sellers; i) stall shop in the market and ii) independent shop. Most of rice sellers are small scale businesses. Especially, stall shop in the markets sell only 100 – 300 kg of rice per day and most are operated by housewives to earn supplemental housekeeping money. Except Phnom Penh and Sihanouk Ville, the number of rice sellers in provincial towns is very limited.

Combining the functions of retailer/wholesaler and direct purchase from rice millers is widely practiced by rice sellers.



Stall type shops in Chbar Ampov Market, Phnom Penh



Rice shops next to Railway Station, Phnom Penh



Most popular way of rice delivery in Phnom Penh

Rice is marketed by variety and there is a definite price order among the varieties. Prices prevailing in their immediate area of operation are well known by all agents.

In Phnom Penh, high/medium-price rice such as Somaly, Phaka Kagney, N. Menh from Bat Dambang are the most common in the city center where residents have the highest income level in the country.

In contrast, medium/low-price rice such as IR, Local variety and Mixed rice are common in the outskirts of the city area where lower income earners live.

Rice from Bat Dambang has an established reputation of good taste and good quality. They are marketed in PP bag printed with variety name and trade mark/ telephone number of rice mill.

Thai Broken rice is sold at most rice shops in center of Phnom Penh. Consumers value this rice and considered as “It is soft and it maintain softness even when rice get cool”.



The “look“ of rice is an important factor in determining price (quality) in the market. Therefore, foreign matter and colored grain are removed before retailing. This practice is not always applied to the Bat Dambang rice since the quality have been improved.

Rice sellers blend the various varieties in accordance with the consumer's order. Many local restaurants use Thai broken rice for blending with local rice to add fragrance and softness.

Cleaning rice at shop, Phnom Penh



### Informal Paddy Border Trade

At present, absorption of rice surplus is highly dependent on neighboring countries, although its export is carried out informally.

Reasons for paddy flow to the neighboring countries are ; lack of a domestic market, more accessible to the other side of the border and often it is more profitable than sell to domestic markets.

Vietnamese traders come up to Prey Veang, Takaev and Kandal provinces by waterways. At some Thai border areas, 'district to district level' discussions are made with local authorities and regular, though very limited, paddy trade is conducted.



Vietnam boats at Peam Ro, Prey Veang province (Jan. '01)



Trucks heading to Vietnam border, Takaev province (Feb. '01)



Paddy collection point near Thai border Banteay Mean Chey province (Feb. '01)



Line of hand tractors crossing Thai border Banteay Mean Chey province (Feb. '01)

## National Roads Condition



National Road 6  
(Poipet ~ Sisophon )



National Road 6  
(Sisophon ~ Siem Reab )



National Road 6  
(Siem Reab ~ Kampong Thum )



National Road 7  
(Kompong Cham province )



National Road 5  
(Pousat province )



National Road 1  
Ferry crossing  
Mekong River



National Road 4  
(Kampong Spueu province )



National Road 1 Damaged by flood (Sep. '00) and Bridge spanned the damage (Kandal province)



National Road 1 Rehabilitation work assisted by ADB (Svay Rieng province)

## Warehouses owned by MOC

MOC warehouses, which were used for collection/distribution of rice in the past under the central economic system, are now less utilized. Most of them were constructed around the year 1985, and they are old and are necessary to renovate to be utilized. Some warehouses with good location are rented by the private sector and WFP, or used by GTC.



Bat Dambang province (along National Road 5)  
Leased to private sector



Svay Rieng province (along National Road 1)



Takaev province (along National Road 2)



same as left (inside of warehouse)



Takaev province (Takaev town port)



Prey Veang province (Peam Ro)  
Utilized by WFP to stock the AID rice

## Field Survey (Phase I)

In the Phase I, addition to the field research by the members, questionnaire survey targeted to farmer/trader/miller/consumer/restaurant and loss assessment survey in the different provinces/cropping types/processing stages were conducted.

Also, PCM workshop for farmers were conducted in Kampong Cham, Bat Dambang and Takaev provinces, and the one for rice millers in Phnom Penh.

### Field research and Questionnaire survey



Rice Bank  
(Takaev province Sep. '00)



Farmer-cum-Custom miller  
(Kampong Cham province Sep. '00)

### Loss assessment survey



Assessment of harvesting and transporting loss  
(Prey Veang province Nov. '00)



Assessment of machine threshing  
(Prey Veang province May '00)

### PCM Workshop



For commercial rice millers (Phnom Penh Nov. '00)



For farmers (Bat Dambang province Oct. '00)

## Technology Transfer Seminar (Phase II)

Three courses of seminars (Course A, B, C) was conducted according the participant in the phase II.

Course A was purposed to transfer the knowledge on the methodology of development planning and outcomes of the study to officials concerned.

Course B was purposed to transfer the practical knowledge on farm level post-harvest technology to the provincial level agricultural extension officers , then to farmers.



Course A-1 (Phnom Penh 20 - 22 June, 01)  
group discussion



Course A-2 (Bat Dambang 26 - 28 June, 01)



Course B (Phnom Penh 2 - 6 July, 01)



Course C-1 (Phnom Penh 12 - 15 June, 01)



Course C-1 Practice for Quality analysis

Course C was purposed to transfer the practical knowledge and technology on quality control in the process of rice milling to commercial rice millers.

Due to the large number of participants, this course was conducted two times; C-1 (June 12-15) and C-2 (June 19-22).