

PRIORITIES FOR IMPROVING GRAIN MARKETING  
IN INDONESIA

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Introduction

Following submission of the final report of the Weitz-Hettelsater Study of Rice Storage, Handling and Marketing in Indonesia<sup>1</sup> and the home office review of the report by Kansas State University<sup>2</sup>, the Food and Feed Grain Institute was requested by USAID/Indonesia to make an in-country review of current grain marketing conditions, and to suggest a priority program for implementation of those Weitz-Hettelsater recommendations which are consistent with the current needs. Dr. Richard Phillips and Dr. Do Sup Chung spent three weeks in Indonesia during May of 1973, observing the rice harvest movement and reviewing the current grain situation with USAID and GOI officials.

The Kansas State University home office review of the Weitz-Hettelsater study includes three sections: (1) General Reactions, (2) Review of Methodology, and (3) Comments on Recommendations of the Weitz-Hettelsater study. The report of the review<sup>3</sup> may be viewed as an appendix to this report.

The General Reactions and Review of Methodology still are valid and are not repeated here. The comments on the Weitz-Hettelsater recommendations which were made in the earlier review are largely superceded by this report. Those comments which provide support for the recommendations presented herein are cited explicitly by footnote reference.

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<sup>1</sup>Weitz-Hettelsater Engineers. Economic and Engineering Study, Rice Storage, Handling and Marketing. The Republic of Indonesia. Kansas City. November 1972.

<sup>2</sup>Food and Feed Grain Institute, Kansas State University. Review of Economic and Engineering Study, Rice Storage, Handling and Marketing. The Republic of Indonesia. Report No. 35. Manhattan, Kansas. March 1973.

<sup>3</sup>Ibid.



## Summary of Developments in Indonesia

### Since the Weitz-Hettelsater Study

Many developments affecting grain storage, handling and marketing have taken place in Indonesia since the field work for the Weitz-Hettelsater study was completed in May, 1971. Salient among these are the following:

1. Substantial increase in the grain storage capacity at the major ports and at terminal and subterminal points.

Most of the added storage capacity is made up of flat warehouses for bagged grain. The warehouses are the typical concrete and masonry construction which has proven entirely satisfactory for Indonesian conditions. They are comparable to the prototypes found by the Weitz-Hettelsater study to be most economic for Indonesia (see Chapter 11).

2. Modernization and increase in grain storage capacity at the large rice mills over the country.

While some totally new mills have been added, most of the development has been modernization of milling machinery and added flat storage for bagged grain at the existing mills. Much of the modernization has included additional drying floor space for sun drying, which also shows up well in the economic analysis in Chapter 11 of the Weitz-Hettelsater report. The developments since 1970-71 have added more to the operating efficiency of the large mills than to total milling capacity -- an important factor since Indonesia's rice milling capacity still is somewhat under utilized.

3. Rapid adoption of modern rubber hullers and jet polishers at the small custom rice mills.

Replacement of Engleberg-type hullers with modern Japanese and Chinese rubber roller hullers and jet polishers has taken place at a rapid rate in Indonesia. Estimates are that up to 10,000 modern small

rice mills now are in operation over the country. Most of these are multi-stage rather than self-contained mills, a development predicted by the analysis presented in Chapter II of the Weitz-Hettelsater report.

4. Continued increases in trucks and other transport equipment.

The number of trucks and other transport facilities has kept pace with the growing volume of grain marketed off farms in Indonesia. The lack of trucks appears far less serious than the condition of the roads, particularly in the more remote areas of the country.

5. Shift from stock padi to gabah.

As Indonesia's farmers continue to shift to the higher yielding rice varieties, the handling of stock padi has given way to field threshing to avoid losses from shattering. In many areas this has virtually

need for stationary rice threshers at the rice mills and created the need for small farm threshers such as the engine-powered drum threshers developed by the International Rice Research Institute.

6. Expansion of education in grain milling and marketing.

Marketing education for large and small rice millers has been expanded considerably over the past few years, particularly by BULOG and the Ministry of Agriculture. The effective program under the direction of Bambang Gunarto of the Ministry of Agriculture (an alumnus of the Kansas State University Grain Storage and Marketing Short Course) is particularly worthy of note.

7. Development of research and demonstration centers for grain handling, storage, and processing.

Indonesia has now developed research and demonstration centers which have the potential for greatly improving grain handling, storage and processing methods in the country. These include the BULOG Research

Center at Tambun in West Java and a number of demonstration centers such as the one in connection with the rice seed farm in South Sulawesi.

8. Substantial deficit in food grain production.

In spite of sustained average annual increase in the production of rice and other food grains, Indonesia continues to import large quantities of food grains to meet sharply increasing domestic demand. Some of the deficit stems from major problems in administration of the National rice policy, but even if these can be solved, Indonesia needs to have more efficient facilities for importing rice, wheat and other food grains in the years ahead.

9. Marketing channels from farm to first assembly.

The private rice marketing channels from farm to first assembly at the rice mills appear to be quite efficient except in those areas where they were being interrupted by efforts to force movements into Government procurement channels (May, 1973).

- For the most part, farm storage at the local village level appears adequate for the harvesting and handling systems now used.
- The small trader who buys directly from the farmer in the field or at his home and transports the gabah to the mill or to a local collection point by bicycle or animal cart represents a key link in the marketing chain. He operates on low margin with his own working capital among people who know him, and provides even the smallest farmer with a ready cash market based directly upon buying prices at the mill.
- Larger traders at the village level buy for cash from the small traders and larger farmers on a delivered basis and transport the gabah to the rice mill, usually in a neighboring village. These traders may have a small truck or hire a custom trucker, but usually they rent a bullock cart from a larger farmer in the area. They also operate on a small margin and could not stay in business if they handled rice alone. Most of them cover their fixed costs by also handling farm supplies and household merchandise.
- The local rice mills operate on a custom basis, and are frequently paid in rice rather than cash. They let the farmer customers use their drying floor and thresher and the farmer supplies the labor

for these operations as well as for the milling of his rice. Most of the local mills operate at low overhead and at very low margins. Some buy, store and mill rice for their own account, but most serve only the local subsistence market on a custom basis.

The larger rice mills buy gabah (or stalk padi) from the traders and direct from the larger farmers for cash. They may advance traders a few days operating capital especially at the start of the harvest season. Purchases are made on the basis of moisture content and percentage of empty kernels. They have substantial sun drying and storage capacity and represent the major collection and storage point for the free market rice. They also represent the key link in the Government rice procurement program (as agent for the nearby BUUD as the procurement program was operating in May, 1973).

Outline of Priority Needs in  
Grain Marketing

The priority needs for improved grain marketing in Indonesia do not require consideration of a major capital loan at this time. A capital loan may be needed to finance such grain handling and storage facilities at the ports as may prove feasible, but cannot be recommended until a careful study of the economic potentials has been made. Other priority needs can be financed through program loans and through ongoing technical assistance programs in Indonesia. The priority needs observed by the Kansas State University team include the following:

1. Careful study of the economic potential for possible port grain handling and storage facilities.

Port facility potentials which are worthy of pre-feasibility study to establish economic potentials include a major import facility at Jakarta, a smaller export and import facility at Surabaya, and a small export facility on the West Coast of South Sulawesi, perhaps at Pare Pare. The study should reflect fully the interrelationships with possible port developments to serve other commodities.

2. Equipment and technical assistance for improved grain handling.

The modernization of the grain handling equipment at the rice mills and grain warehouses have not kept pace with that of the milling and storage facilities. The availability of belt conveyors and other modern grain handling equipment together with on-spot advice regarding proper use of the equipment could greatly improve grain handling efficiency. It would also stimulate the shift from bag to bulk handling when millers and handlers recognize the economic incentives to do so.

3. Assistance in developing and administering an effective National rice policy.

Because of the dominance of rice in the Nation's economy and the complexities involved, Indonesia has not been able to solve the many problems associated with developing an effective National rice policy.

There appears to be no quick and easy solution. In order for technical assistance in this area to be effective, it must include a qualified resident advisor plus effective short-term, specialist support.

4. Assistance in conducting effective research and demonstration programs.

The research and demonstration facilities for grain milling, storage and handling now constructed in Indonesia can be more effective if their staffs are provided with organized support and back-stop services by such organizations as the Food and Feed Grain Institute and the International Rice Research Institute.

5. Participant training programs in grain marketing.

The development of grain marketing in Indonesia has reached the point at which substantial benefits can be derived from accelerated programs of participant training in grain marketing. The types of beneficial participant training include (1) specific in-country and regional short courses, (2) the annual world-wide Grain Storage and Marketing Short Course at Kansas State University, and (3) foreign academic training, especially at the Masters Degree level in applied grain science and agricultural economics.

Potential for Port Grain Handling and  
Storage Facilities

The changing conditions in Indonesia since the field work for the Weitz-Hettelsater study was done make it desirable to carefully determine the economic potential for modern port grain handling and storage facilities. Brown rice is being imported in substantial quantities. Wheat imports are growing rapidly, and substantial quantities of corn have been imported. Furthermore, sizable out-shipments of rice and corn to deficit areas of Indonesia are made from South Sulawesi and East Java following the harvest seasons. Major savings could be made by receiving and loading grain in bulk with larger vessels than is now possible.

The Kansas State University team recommends a pre-feasibility study of the economic potential for port grain facilities rather than a full economic engineering feasibility study at this time. This is done for a number of reasons:

1. The economic potentials may prove to be too limited to warrant a full feasibility study.
2. The potential for the facilities will depend upon the timing of the other port developments particularly in Jakarta and Surabaya. Possible finishing of port developments for fertilizer, for containerized cargo, and for petroleum products are under consideration by other donors. The pre-feasibility study can reflect the results of the related port studies and the timing of possible port developments.
3. The probable utilization of potential port grain facilities depends heavily upon future National and Provincial policies particularly with respect to rice. The pre-feasibility study can identify the specific

conditions necessary for the economic viability of the potential facilities so that they can be considered before a full scale feasibility study is made.

It is believed that the pre-feasibility study should focus on the potential for three interrelated port grain handling and storage facilities, (1) major importing facility at Jakarta, (2) an importing - exporting facility at Surabaya, and (3) a small exporting facility at Pare Pare or other South Sulawesi port. The study should reflect potential handling volumes of wheat and corn as well as rice. Possible tonnages of other bulk commodities such as pelleted mill feeds also should not be overlooked.

The proposed scope of work for the recommended pre-feasibility study is indicated by the specific objectives. The study should take due account of the Weitz-Hettelsater report and the Kansas State University review cited above, particularly the sections relating to the import of brown rice.

Equipment and Technical Assistance for  
Improved Grain Handling

With the modernization of rice milling equipment and grain storage capacity that has taken place in Indonesia, conditions are ripe for modernization of grain handling methods, particularly for gabah. Much of the horizontal conveying is done by hand. The screw conveyors and chain drags that are used for bulk conveying are damaging to the rough rice, and require that the bags be dumped before the conveying is done.

The conveying system used to and from the sun drying floors at the large rice mills illustrates present handling methods. The gabah is received in bags which are opened for inspection and grading. They are frequently dumped in the receiving warehouse so that the incoming bags can be returned to the seller. The gabah is then resacked into bags owned by the mill, carried to the drying floor where the bags are dumped and the gabah spread out on the drying floor. After frequent turning by hand raking while the sun is shining, the gabah usually has to be hurriedly pushed into large winrows and covered with plastic before the start of afternoon rain showers. The gabah then has to be resacked (sometimes in the rain) and carried by hand to the warehouse. This process is repeated for an average of three or four successive days before the gabah is dry enough for storage and milling.

Belt conveyors between the storage area and the drying floor would do much to modernize this handling system. The labor required for sacking, carrying sacks, dumping, resacking and carrying back the same gabah for three days in a row is relatively cheap in Indonesia. However, the savings in sack costs plus the saving in additional drying time by reducing the need to handle the gabah during rain showers will more than pay for the conveyors, even if the labor saving is ignored.

Small low-speed belt conveyors and auxiliary equipment can be used in the small custom rice mills and in the grain warehouses as well as in the large mills to modernize handling methods and reduce damage to the gabah. The supporting equipment needed includes drives, power sources (electric motors in the large mills, small gasoline or diesel engines in the small ones), carriage for portable conveyors and mounts for the built-in ones, some small bucket vertical elevators, spouting, hoppers and related equipment. Many of the conveyors should be convertible so that they can be used to move either bulk or bagged grain.

Indonesia has had virtually no experience with belt grain conveyors, but if appropriate technical assistance is provided, rice millers and handlers can be expected to quickly learn how and where to use them effectively. As they install them the process of conversion from bag handling to handling in bulk will be facilitated.

In order to introduce belt conveyors and their use, it is recommended that model belt conveying systems be installed at the Tambun Research Center and at the various demonstration centers over the country. These can be used for conducting training for rice millers and grain handlers as the models for the planning and layout, installation and use of the belt conveyors under conditions in Indonesia.

It is estimated that the total cost of the belt conveying systems for demonstration installations, the supplying of these systems to those rice millers and handlers which will request them and the technical assistance on the installations and use of the systems will not exceed \$350,000 annually over a two-year period. It is recommended that the financing of this program be considered under an Agency for International Development Program Loan. A rough cost estimate for the program as visualized is contained in the Appendix.

Assistance in Developing and Administering  
an Effective National Rice Policy

Few will disagree with the statement that an effective National rice policy is crucial for the continued development of Indonesia agriculture. Rice is a major subsistence crop as well as a major cash crop in all areas of the country. Expenditures for rice represent a major item in the budget of every Indonesian's household. Employees frequently receive a rice allowance as a supplement to their wages. Various taxes on rice provide a major source of public revenue to provincial, district, and local governments. The implementation of rice price stabilization programs consumes an enormous amount of human effort including that of the top leaders in the country.

The development of an effective National rice policy is no easy task for Indonesia's leaders, and cannot be done over night. It appears that sound technical assistance in the many facets of grain marketing can provide GOI leaders with some of the support needed for developing such a policy. It is believed that the needed technical assistance includes a qualified resident advisor backed by short-term specialists and institutional support. The content of the technical assistance is indicated by the comments made in the earlier review<sup>4</sup>.

It is recommended that this kind of technical support be delivered by providing the resident advisor and the short-term specialist support through the mechanism of the Agency for International Development world-wide contract with Kansas State University for technical services in grain marketing (AID/csd-1588). It is believed that this can be done under existing agreements between GOI and USAID/Indonesia.

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<sup>4</sup>Food and Feed Grain Institute. Op. cit., pp 33-35.



Assistance in Conducting Effective  
Research and Demonstration Programs

The recently completed research and demonstration facilities for grain milling, storage and handling methods offer much promise for productive applied research to solve grain marketing problems in Indonesia. They are equipped with modern handling, conditioning, storage and processing equipment. The present equipment can be supplemented by the belt conveyor systems recommended above. The BULOG Research Center at Tambun is also equipped with adequate laboratory testing equipment for rice, but may need more complete equipment for corn and other grains.

The FAO is currently providing short-term technical assistance to the staff of the Research Center in the design and conduct of handling, conditioning, storage and milling research studies. It would be very desirable to follow this assistance with implementation of a program through the Food and Feed Grain Institute and the machinery division of the International Rice Research Institute for continuous exchange of research information and short-term technical assistance to the Research Center. Such a program also can include assistance in the extension and demonstration of research results through the demonstration centers in Indonesia. If properly organized, the program can draw on the technical skills at the Indonesian university, and in time relate closely to the graduate training programs recommended in the following section.

Major areas needing immediate research attention include (1) drying and storage management, (2) the relationships between alternative drying methods and milling yields, (3) the relative costs of bulk versus bag

drying, (4) storage and handling under Indonesian conditions, (5) economics of size in grain storage facilities, and (6) potentials for aeration in Indonesia<sup>5</sup>.

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<sup>5</sup>Food and Feed Grain Institute. Op. cit., pp. 22-25.

Participant Training Programs  
in Grain Marketing

The Kansas State University team believes that grain marketing in Indonesia has reached the point at which substantial benefits can be derived from accelerated programs of participant training in this field. The types of participant training recommended can be handled with existing programs; they should not require inauguration of new programs.

The specific types of participant training in grain marketing recommended for acceleration include the following:

1. Specific in-country and regional short course.

In-country short courses can be organized to deal with a range of operational and management problems of grain dealers, rice mills, grain warehousemen and others actively engaged in grain marketing. Some of these can be built around research findings at the Research Station, and might include teaching of actual handling procedures at the demonstration centers. The Food and Feed Grain Institute is in a position to assist with organization and teaching of this type of in-country short course.

Regional short courses in which a number of countries participate offer promise of training in somewhat more depth for selected participants. One such short course in grain marketing is tentatively scheduled in Bangkok for January 1974. It will draw upon instructors from the Kansas State University short course (discussed below).

2. Grain Storage and Marketing Short Course at Kansas State University.

The Indonesian participants which have attended this specialized two-month short course over the past three years are demonstrating the value of the training to help increase marketing efficiency in Indonesia. The GOI and USAID are to be commended in careful selection of the participants,

and in following up with them upon completion of the training. It is believed that Indonesia profitably could send as many as five participants per year to this short course over the next several years.

3. Academic Training Programs.

Specialized graduate training programs represent the third type of participant program recommended. Participant M.S. and Ph.D. programs at universities in the United States are not new to Indonesia. It is believed that the type of academic training which may warrant most rapid expansion in the years immediately ahead is represented by the applied programs at the M.S. level. As an example, Kansas State University now offers specialized M.S. programs in such fields as grain milling baking, grain storage and economic analysis of grain marketing problems.

## APPENDIX



A Rough Cost Estimate of the Program for Improved Grain Handling at Rice Mills in Indonesia.

Item	Specification	Unit price	Quantity	Total cost
<u>1. The First Year</u>		U.S.\$		U.S.\$
1. Belt conveyor (trough type)	18" wide belt, 50' long, 30TPH capacity, complete with head and tail terminals, troughing idlers (20 <sup>0</sup> ), return idlers, channel frame, 3' stub legs with casters, 1 HP motor, drive and belting.	3,700		
Export crating	--	<u>560</u> 4,260 <sup>1/</sup>	4	17,040
2. Belt conveyor (flat type)	bag handling for horizontal 24' flat belt, 28" long complete with motor and drive, movable.	1,077		
Export crating	---	<u>162</u> 1,239 <sup>1/</sup>	20	24,780
3. Belt conveyor (flat belt with flights) Engine drive	portable bulk handling for horizontal or elevating, 6" wide belt with flights, 15 TPH capacity, 30' long, max rise, 19' 3 HP gasoline engine with sheave, dolley with wheels.	750 <sup>2/</sup>	80	60,000
4. Belt conveyor (flat belt with flights)	portable or permanent bulk handling for horizontal or elevating, 10" wide belt with flights, 25 TPH capacity, 30' long max. rise, 19', 2 HP motor and drive.	950 <sup>2/</sup>	100	95,000
5. Belt conveyor (tubular)	portable bulk handling for horizontal or elevating, 12" flexible belt travels through a rigid steel 10" dia., 50 TPH capacity, 40' long max. rise 20', complete with wheels, undercarriage, towing hitch, 10 HP motor and drive.	2,300 <sup>2/</sup>	4	9,200

A Rough Cost Estimate (Cont'd.)

Item	Specification	Unit price U.S.\$	Quantity	Total cost U.S.\$
6. Bag conveyor	portable, bag handling for up, down or horizontal, 16" wide belt, 20' long, max. rise 16', 300 lbs. capacity, complete with conveyor, lift, 3/4 HP motor and drive.	1,800 <sup>3/</sup>	40	72,000
7. Bulk tank	6' diameter tank with obround discharge equipment with gate ladder overall height 13', 4.4 tons capacity.	300 <sup>3/</sup>	50	15,000
8. Technical Assistance	Training on the planning and layout, installation and use of handling equipment.	27,000	2	54,000
<u>II. The Second Year</u>			Grand Total (1st yr.)	<u>\$347,020</u>
Item #2 in (I)		1,239	20	24,780
Item #3 in (I)		750	80	60,000
Item #4 in (I)		950	150	142,500
Item #6 in (I)		1,800	40	72,000
Item #7 in (I)		300	50	15,000
Item #8 in (I)		27,000	2	54,000
			Grand Total (2nd yr.)	<u>\$368,280</u>

<sup>1/</sup>The prices are obtained from C. E. Ehram Co., Abilene, Kansas and are FAS San Francisco, California.

<sup>2/</sup>The prices are estimated from Burrows Equipment Co. Catalog No. 16 and export crating and freight charges are not included.

<sup>3/</sup>The price is estimated from Butler Manufacturer's suggested selling price catalog, and export crating and freight charges are not included.