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GRAIN MARKETING IN SOUTH VIETNAM

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FOREWORD

This study is one of a series of marketing studies conducted by the U.S. Department of Agriculture in cooperation with the U.S. Agency for International Development and the Ministry of Land Reform, Agriculture, Fishery and Animal Husbandry Development of the Government of South Vietnam. The series provides detailed descriptions of marketing systems for several major farm products, supplies marketing input data required for a linear programming model being developed to study production-distribution relationships for farm commodities, and assesses the need for changes in the marketing systems. Assessment of the need for change was based primarily upon (1) the relationship of the costs incurred in providing the services required to move farm commodities from farms to consumers and the marketing charge, or margin, for these services; and (2) the extent to which the existing marketing systems provide the services currently required or expected to be demanded in the near future by growers and consumers. Covered in the reports are livestock products, oilseed processing, sugarcane and raw sugar processing, swine, poultry, horticultural crops, grains, and transportation.

Personnel of the Marketing Economics Division of USDA's Economic Research Service had prime responsibility for the studies under Participating Agency Service Agreement No. SA/VN(AJ)103-72. However, many others also deserve recognition for their cooperation and assistance, including other Ministries of the Government of Vietnam; the farmers, merchants, and others in Vietnam's private sector; and the staff of the U.S. AID Mission to Vietnam. Particularly helpful in this grain marketing study were: Donald F. McConville and Peter Kao, USAID Joint Economic Office; Vic Clark, USAID/ADFA; Director Lê Văn Kim, General Supply Agency; Vice Minister Nguyen-Duc-Cuong; Mr. Nguyễn-văn-Vân and Mr. Doan-Bá-Tri, special assistants for rice, Ministry of Economy; and Mr. Dinh-Nho-Nguyễn, Ministry of Agriculture.

This marketing series is part of a larger ERS Vietnam project. The first phase of the larger project was a review of Vietnam's 5-Year Rural Economic Development Plan, with a report published in December 1971. Other phases being completed now are a series of demand and price studies and the production-distribution model mentioned above.

The several series of studies have three objectives. The first is to develop a body of economic information from readily available sources for immediate use by the Ministry and USAID Mission in making decisions regarding development of Vietnam's agricultural sector. Secondly, the research methodology used and the economic information developed are to provide a basis for work by the recently established Directorate of Agricultural Economics. Finally, the participation of members of the Ministry staff in the conduct of these studies, together with any specialized training associated with the project, is expected to acquaint them with the research procedures followed so that the analysis can be continued and improved.

William A. Faught
Project Coordinator

SUMMARY AND CONCLUSIONS

Vietnam has traditionally been deficit in wheat and feed grains and, since 1964, has also imported rice. Use of new, high-yielding rice varieties is dramatically increasing, however, and feed grain production is expanding to meet a growing demand. These production increases create problems for the marketing system, particularly as Vietnam works to again become an exporter rather than an importer of rice.

Consequently, this study to recommend improvements in the grain marketing system was undertaken as a part of a larger U.S. Department of Agriculture project in cooperation with the U.S. Agency for International Development.

Rice Marketing

Although Vietnam hopes to return to export status, considerable confusion exists as to quantity of paddy produced, yields, distribution, and consumption. It was not possible to determine how close Vietnam is to self-sufficiency in rice production and what the near future holds for possible exports. Hostilities in combination with concessional import programs have created prices that do not accurately reflect supply and demand conditions. Also, the world market is now far more competitive and Vietnam may be unable to compete effectively with its existing processing equipment and marketing system.

The success of the Land-to-the-Tiller program and the increasing production of the new high-yielding rice varieties (TN) are causing increased buyer competition at the local level. The former "sharecropper" has more rice to sell, and is achieving greater financial independence as the old credit ties to rice millers, merchants, and others break down. He is thus more flexible and is in a position to bargain with buyers. The farmers we interviewed consistently reported being contacted by many buyers. Also, these local buyers are increasingly self-financed and more competitive, although there seem to be close working arrangements between particular merchants and mills.

Timing of harvest is also changing as the TN varieties increase in popularity. They mature faster than traditional varieties, which are harvested during the dry season. Drying for domestic use has not been a problem. However, with harvest of one or more TN crops likely during the rainy season when sun drying is difficult, some mechanical driers will be necessary. How much drying capacity is needed and where? Figures provided by USAID indicate that as much as 2 million metric tons of paddy might be harvested during the rainy season. Vietnamese Rice Service data provide some additional but incomplete information indicating the drying problem might not be nearly so serious. Neither set of information, however, was adequate to provide a basis for specifying a mechanical drying program. Subsequent arrangements were made to develop better information.

Only about 27 percent of Vietnam's current rice production enters commercial off-farm channels. As rice production increases, off-farm sales

will increase sharply, potentially creating the need for additional commercial storage, transportation, and perhaps even milling facilities. We estimate that Vietnam has nearly 1 million metric tons (M.T.) of off-farm storage, nearly one-fourth of it in the Saigon-Cholon area. The majority of the warehouses are old and need repair. Many have dirt floors, and only a few have adequate ventilation and offer suitable protection from rain, birds, insects, and rodents. The practice of using rice hulls for floor covering and the reuse of unfumigated bags make insect control nearly impossible.

A few cooperatives reportedly have some bin space, but no bulk handling facilities were visited or seen in the Delta and Saigon areas. The rice system is bag-oriented and will likely remain that way for the foreseeable future. The foreign exchange requirements to revamp the system to bulk handling, the expertise required to operate it, and the potential displacement of labor in a potentially surplus labor economy all support and enforce the current system.

Bulk handling has many advantages and provides the basis for the advanced central storage and marketing system recommended in the Wildman Agricultural Research Inc. report prepared in 1970. It is our opinion, however, that the adoption of such a capital-intensive, mechanized system now would be premature. Instead, immediate efforts should stress improving quality control in existing facilities and incorporating those facilitating services that are of direct assistance to farmers and the competitive functioning of the marketing system. Nevertheless, the Government of Vietnam (GVN) should plan on eventual bulk handling of rice and other grains and carefully coordinate and encourage the supporting services and facilities suggested in this report that make bulk handling feasible.

The number, capacity, and location of rice mills in Vietnam are becoming better documented each year, although the data are still incomplete. There seems to be enough milling capacity to process a considerably larger crop than is now produced or is likely to be produced in the foreseeable future. Considering all paddy is not milled, we estimate current milling capacity of 8 million MT of paddy production.

The quality of milled rice, however, is an entirely different matter, particularly if GVN should embark upon an export program. Some millers and merchants thought the larger "cono" mills might conceivably be adjusted and upgraded by the addition of separating and blending equipment to produce grades of rice acceptable to world trade. Others said new modern mills would be required. The grain team agrees with the latter view, particularly because of the drying problem and the strong interrelationship between proper drying and quality milling and sanitation deficiencies associated with existing facilities. Considerable improvement will be required in drying practices and milling technology to effectively compete in world markets, and a program to implement this change is outlined in the report.

Low quality and insufficient supply are not the only factors keeping Vietnam out of the highly competitive export market. Local rice prices are currently higher than world prices. A program to bring local prices to competitive levels will be required. Work underway by the USDA/ERS demand

and input team and previous analysis of price policy should be quite helpful in evaluating alternative policies and developing an effective program. Nearly without exception, Vietnam's major assemblers, mill owners, and merchants are Chinese. Their influence in the rice industry concerns many public officials. Allegedly six to eight Cholon merchants exert considerable influence on the rice marketing system. However, an analysis of marketing margins and costs during 1971 does not support the popular belief that the Chinese merchants are collectively influencing rice prices to their benefit. The marketing margins of the Vietnamese rice system seem to be in line with costs. This does not mean that marketing costs cannot be reduced and margins lowered. Historically, however, costs increase as marketing systems are improved through upgrading the product and adding services desired by consumers. In 1971, the Vietnamese Delta farmer received about 76 percent of each piaster the Saigon consumer spent for rice and the remainder went to assemblers, millers, wholesalers, and retailers. As the quality of the milled rice is upgraded and services are added, the farmer's percentage will decrease and the others' share will increase to cover the added cost. For example, in the highly sophisticated marketing system of the United States, the farmer's share of the consumer's rice dollar is only 34 percent.

An analysis of rice prices (No. 1, 25 percent broken) from May 1969 through December 1971 reveals that imports can be effective in controlling rice price levels and the spread between Saigon and Delta prices. Whether or not imports were knowingly so used, price relationships were affected and Delta deliveries to Saigon were understandably at minimum levels. The system did not function "normally" because there was little or no price incentive. Even in 1971, when Saigon prices were generally above Delta prices, the spread, on the average, was not sufficient to cover the costs of moving rice from the Delta to Saigon. Consequently, monthly Delta deliveries to Saigon were only the equivalent of government contract requirements, averaging 44,000 MT. Part of these were commercial deliveries as GVN had to utilize about 100,000 MT of stocks and limited imports to meet their annual requirements. Delta paddy prices were low compared with hog prices in early 1971, making feeding attractive. Much paddy was undoubtedly fed and supplies were short later in the year as prices increased. Thus, the system's lack of response to deficit-area demands reflected mainly the dampening influence of imports on Saigon prices, along with the GVN policy to subsidize consumption in deficit areas and the attractiveness of feeding paddy, and not the marketing system's structure.

Corn, Grain Sorghum, and Wheat Marketing

Vietnam is deficit in feed grains and wheat. The United States supplies these grains to local feed and flour mills under various assistance programs. Vietnam produces about 30-35,000 MT of corn annually. Some 80 percent is consumed as human food, leaving about 6,000 MT for animal consumption. Grain sorghum is a new crop with initial plantings of 6,000 to 14,000 hectares (ha.) in early 1972. Goals for feed grain production have been set at 400,000 MT by the 1975-76 crop year. Livestock demand will probably be strong enough to absorb that level of production.

Vietnam has no farmer marketing system for feed grains, however, so the grain sorghum planting program is speculative. Local farmers are not familiar with producing grain sorghum, harvesting it, marketing it, or feeding it. Additionally, adequate drying and threshing equipment was not available. Unless arrangements are made to help farmers for the first year or two, the entire program may collapse from the lack of a marketing system and demand from feed mills.

Feed mill capacity was estimated at 21,000 MT a month, on an 8-hour per day schedule, or about double present production. The ingredient storage capacity of the new mills visited was only a 2-to-3-week inventory. Storage will need to be expanded as local corn and grain sorghum production increases. This storage can be located at mills or at local assembly points more convenient to farmers.

Wheat flour milling capacity was estimated at 500 MT per 24-hour day, divided between two mills in the Saigon-Cholon area. All wheat for milling is imported from the United States. Most wheat is handled in bags from the ship through the warehouse, although ship and barge bulk unloading facilities are being considered. The two flour mills have only recently been built and are of modern technological design. Wheat imports will probably continue, implying that except for improved unloading facilities at the Saigon port, requirements for a local marketing system are minimal.

Need for Supporting Services

Competition is being restricted in the rice industry and trading made unnecessarily difficult by the virtual absence of facilitating services. Without knowledge of prices in local and alternative markets and the costs of getting his rice to those markets, the producer or marketing agency is in a poor bargaining position. Middlemen must increase their prices to provide sufficient margins for uncertainty. Margins throughout the system widen as a result, causing higher prices to consumers and hampering efforts to compete in world markets. But a market information service will still have trouble if it lacks a well understood system of grades and standards. If prices are related to qualities described in different terms by each mill or merchant, or if the grades lack precision and meaning, the value of price information is greatly reduced and competition is restricted.

Similarly, a readily available source of inventory financing at favorable rates would greatly improve the system's performance. Because of the seasonal nature of production, some grain must be held in inventory for several months at some point in the system. Substantial operating capital is required to finance commercial inventories at current interest rates, hindering the development of a strong assembly and storage industry and resulting in poor quality control, unnecessary losses, a restriction of competition and farmer outlets, and a system oriented to the inefficient marketing of small lots throughout the year.

These services, along with an increased extension effort to help the industry better understand their advantages and how to use them effectively,

will improve the rice flow and reduce or minimize the marketing margins within the system. As production increases and marketing systems develop for feed grains and possibly wheat, similar services will be needed.

INTRODUCTION

The so-called "green revolution" is well underway in Vietnam. Rice production has increased dramatically as the high-yielding varieties have gained farmer and consumer acceptance and are improved by the researchers. Additionally, the Government of Vietnam (GVN) is devoting considerable effort to expanding production and meeting its growing feed grain demand.

The impact of the green revolution on the marketing system, and what adjustments are most desirable, is still being debated, however. Consequently, this study was undertaken as a part of a larger U.S. Department of Agriculture, Economic Research Service, Vietnam project in cooperation with the Office of Food and Agriculture of the U.S. Agency for International Development, Mission to Vietnam.

This report on recommendations for improving the grain marketing system includes: (1) a description of the system and analyses of its weaknesses, (2) recommendations for changing the current system over time so that it will meet Vietnam's projected needs, (3) suggestions on how to initiate the changes and when they might be most appropriate, and (4) cost coefficients relating to grain drying, threshing, storage, and processing which were required for a production-distribution model being developed in another phase of the USDA-USAID Vietnam project.

Information was gathered from a review of numerous previous reports on the grain marketing systems of Vietnam and other Southeast Asia countries, field trips and interviews in the United States with selected grain researchers, and an 8-week in-country study (January 15, 1972-March 11, 1972) to observe the marketing system and interview grain producers, rice and wheat millers, feed manufacturers, storage operators, transportation agents, merchants, and public representatives associated with the grain industry.

The grain storage and marketing system of Vietnam was described in substantial detail by Wildman Agricultural Research, Inc., in March 1970. (29) ^{1/} Consequently, only a brief overview of the system is presented here, along with discussions of conditions that have changed, or seem to be changing, if they bear on the effectiveness of the system or the team's recommendations. Estimates of grain flows and the quantity and quality of storage and processing facilities are also included.

Rice receives the most attention because it is the major food and feed grain in Vietnam. Also, with recent increases in production, its pressures on the marketing system are most urgent. Practically all of Vietnam's feed grains and wheat are imported, but attention is also given to these grains in this study because of GVN policy to increase their production. When their production is increased, they will compete with rice for services within the marketing system.

^{1/} Figures in parenthesis correspond to references on page 57.

RICE MARKETING

Before 1964, South Vietnam was an exporter of rice, with the Mekong Delta area supplying the surplus. During subsequent war years, production was seriously interrupted, with much land being abandoned. Additionally, per capita rice consumption in the lower income central and northern provinces allegedly increased, however, as personal income rose due largely to opportunities for U.S. military-related employment. Preliminary research indicates an income elasticity of 0.326 for cereal in lower income Vietnamese families (5). The production deficit has been met by imports, primarily from the United States, to Saigon and northern port cities in the deficit areas. The introduction in 1967-68 of the new high-yielding varieties TN-5 and TN-8 started to reduce rice import requirements. With the more recent introduction of TN-20 and TN-22 and now TN-1, Vietnam is increasing production and planning to shortly return to export status (20). 2/

Many problems are inherent in this potential transition with vast implications for the marketing system. Aside from the decentralization of milling facilities from Saigon to the Delta, the current marketing system has changed very little during the past 20 or more years. But world market requirements have changed significantly as the green revolution progresses and former importing countries approach self-sufficiency. The international rice market is now far more competitive. It is highly doubtful that Vietnam can compete effectively in this market with existing processing equipment and marketing system. As the Wildman report pointed out, not one sample of milled rice examined was good enough to be acceptable in normal world export markets. Thus, in evaluating the current marketing system, one must distinguish between requirements of the domestic market and the more competitive international market.

Production Areas and Supplies Versus Consumption Requirements

Rice is produced throughout Vietnam, but about 80 percent is in the Delta, mostly Military Region IV (MR-IV) plus Long An Province (25). The major population and deficit consumption areas are Saigon and the larger cities along the central and northern coast. Most rice is milled in the producing areas and, in the case of the surplus Delta, shipped to Saigon for distribution. Except for a few coastal areas, the provinces outside the Delta are deficit in rice and most of the rice crop is consumed on farms where produced.

Various production estimates, projections, and goals are available. Deficit area province officials may tend to understate production to insure adequate GVN imports from the Delta or foreign sources. The Directorate of Agriculture of the Ministry of Land Reform and Agriculture and Fishery Development (MLRAFD), responsible for increasing production, may tend to be optimistic. Generally, province hectarage and yield estimates coincide with established goals, resulting in a production figure many feel is inflated.

2/ TN 5, 8, 20, and 22 are high-yielding rice varieties developed at the International Rice Research Institute in the Philippines. TN-1 was developed in Thailand.

Market flow data provide little help in estimating production because substantial amounts of rice are consumed on farms where produced, and, except for milling in the case of human consumption, never enters the marketing system. Also, rice millers are subject to numerous taxes and are reluctant to report actual quantities milled (29).

Reported Delta shipments are probably understated between 10 and 25 percent. (8). The sources of error are such factors as shipments being missed at checkpoints, the omission of movement data on shipments under 500 kilograms, and incorrect weights on movement permits. It is generally accepted that most rice trucks arriving from the Delta are approximately 2 tons overweight.

Consumption data are confounded by limited information on per capita consumption, total population, and the amounts of rice fed to livestock. A new and more broadly based consumption survey would be highly desirable. Based on a limited survey 10 years ago, per capita consumption appears to range from 170 kilograms annually in the Delta to 158 in the central deficit area to 116 in Saigon. For the entire country a rate of 155 kilograms annually is generally accepted (8). However, analysis of the 6-city 1970 consumer expenditure data is underway which may shed additional light on the problem (5).

There are two "official" series of population figures. Until 1971, they differed by 1.0 to 1.5 million. In 1971, they were only 100,000 apart at 18.7 and 18.8 million people (26). One is based on registrations with the local police and the other upon a projected 2.6 percent growth rate from an estimated 1960 base. Many felt both were too low. It is understood that the Ministry of Planning has recently decided to use a 3 percent growth rate beginning with the 1972 estimate. Similarly, adequate information is lacking on livestock numbers or agreement on their grain consumption--primarily rice. However, Foote (8) and Daly (5) are continuing to work with available data and trying to develop better estimates of livestock grain consumption.

Two recent reports (8, 14) have analyzed rice supply and utilization in Vietnam. Figure 1 shows the estimated marketing network of rice for food use in the November 1970-October 1971 crop year. Foote did considerable work in overcoming data inconsistencies and the grain team feels his estimates are the best available on off-farm sales and total distribution to the deficit areas. The percentage distribution figures at each marketing level are the grain team's own estimates based on in-country observations and discussions. These are merely estimates because adequate data are not available on production, milling, distribution, or consumption.

There is also disagreement on the percent yield of rice attained by the mills. Most sources noted in Foote (8) and Wildman (29) and the Agricultural Economic and Statistical Service (AESS) official calculations of November 1971 estimate 60 percent milled rice yield from paddy. Personal interviews with millers provide a slightly higher figure which is similar to yield estimates suggested by Mr. Thach, AESS, and by the Chinese Agricultural Technical Group (CATG) to Vietnam (2). The following estimates are applicable to paddy received at the mill and do not cover seed, storage, transit, and shrinkage losses of paddy prior to receipt at the mill.

MARKETING NETWORK FOR RICE IN VIETNAM, NOV.-OCT., 1970-71

Figure 1

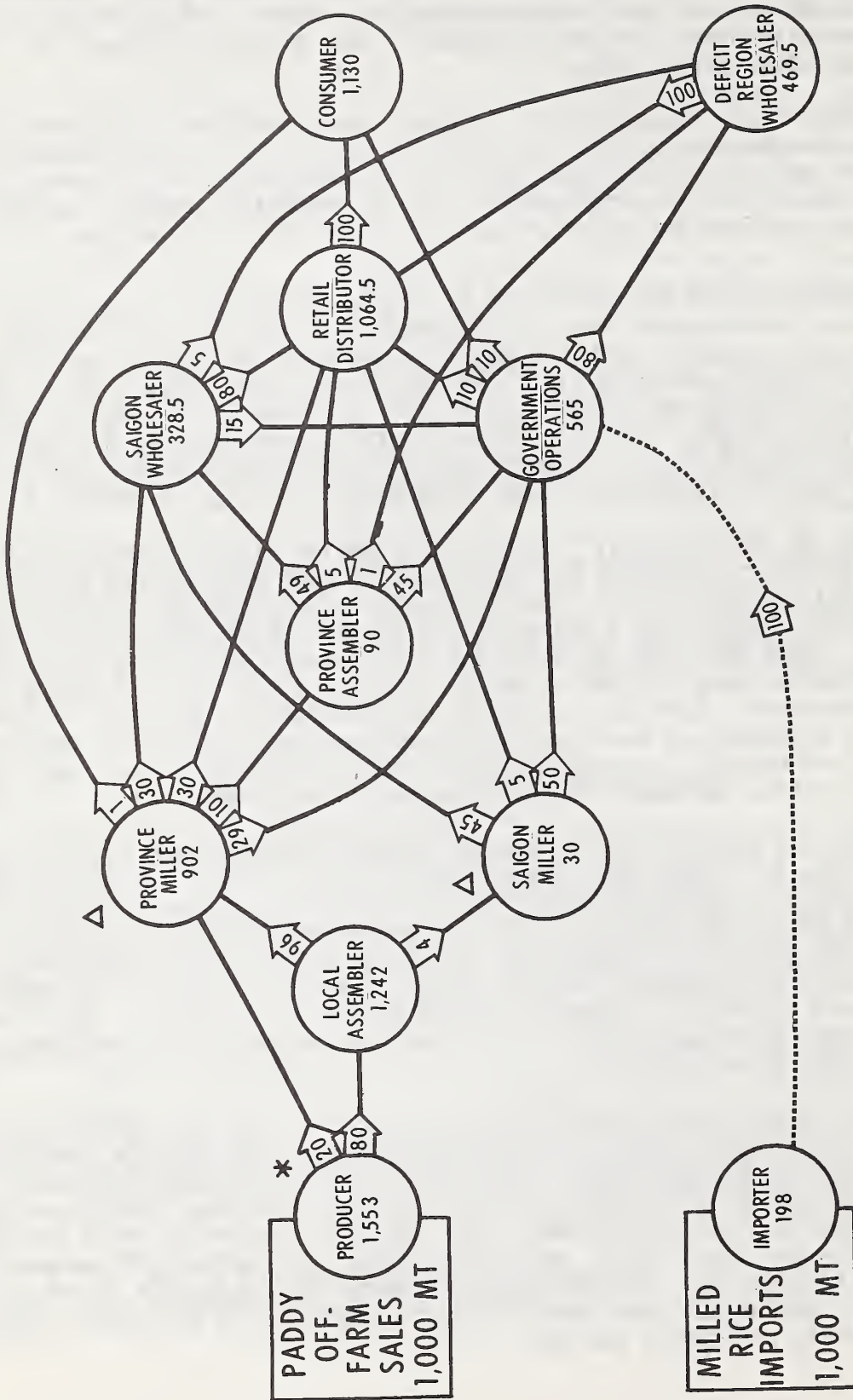


Table 1.--Estimates of rice milling yields in Vietnam, 1971

	Grain team estimates	Thach	CATG
	Percent		
Milled rice, 25% brokens...	62.50	62.5	61.44
Brokens.....	5.00]		[3.62
Bran.....	10.00] 15	13.5	15.37 [11.75
Hulls.....	21.25]		[21.69
Loss.....	1.25] 22.5	24.0	23.19 [1.50
Total.....	100.00	100.00	100.00

These yields, if correct, would mean more milled rice is available for food consumption and less bran and brokens for livestock consumption than estimated by current procedures. Thus, one cannot be sure about the quantity of rice produced, its distribution, or its consumption.

Local Assembly

The timing and methods of local assembly and competition at this level seem to be changing somewhat since the Wildman report. Two major factors are involved: the success of the Land-to-the-Tiller program and the increasing acceptance of TN rice by farmers.

A large part of the better rice land had been held by relatively large landowners, with basically a sharecropper arrangement. Only one crop was produced each year, a single variety reportedly was produced over the entire farm, and the landlord assembled and marketed a relatively large lot of uniform quality rice. The sharecropper stayed largely indebted and "sold" his rice at harvest to settle his accounts. Under the Land-to-the-Tiller program these holdings are being broken up and titles given to former sharecroppers and others. A mixture of varieties is being produced, rice is being harvested twice a year in many areas, and the yields are much higher with the TN varieties. The smaller rice farmers are producing a mixture of high-yielding and traditional varieties and are achieving greater financial independence, thus breaking down the former credit tie to rice millers, merchants, and others.

Interviews with Delta rice farmers, merchants, and mills indicated a significant increase in competition for rice at the farm level. The former

sharecropper now has more rice to sell and, with lessening credit ties, is more flexible to sell a little rice at a time as he needs cash; he is in a position to bargain with various buyers. Although only a few farmers were interviewed, they all reported many buyers contacting them and, consequently, felt they fairly well knew the current local market prices. The roving merchants, some of whom were interviewed, also seemed to be largely self-financed, another change in recent years.

Local assembly is largely bag oriented. Much of the rice is being delivered to the mills in small lots by farmers and assemblers via sampans, bicycles, and motor-powered vehicles. The roving rice merchants described by Wildman are still quite important, particularly in the production areas more distant from rice mills. They use trucks and larger boats (often 10-50 metric tons) for assembly. In the latter case, the rice may be hauled in bag or bulk. If bulk, it is nearly always bagged at destination to facilitate unloading. It is a very labor intensive assembly system, partly because of the high price of bags (about VN\$200). Farmers often empty the bag in the sampans and boats at time of delivery and retain the bags to use again.

Thus, the assembly function is performed either by the farmers or the roving merchants who represent one or more mills. The assembler operates on the spread between prices mills quote him and the price he pays the farmer, usually about VN\$ 10-20 per gia 3/ varying largely with distance from the mill. There seemed to be an alliance between particular merchants and mills and, as noted earlier, a higher degree of competition than had been expected from reviewing earlier reports and from discussions in Saigon.

Some price differentials were noted between the poorer red (floating) rice and higher quality paddy, but the discounting of TN varieties (up to 20 percent had been previously reported) had practically disappeared in early 1972. The reason given was that farmers, merchants, and millers blend this "lower quality" TN rice with traditional varieties (two bags old paddy mixed with one bag fresh TN) to assist in drying the TN and to avoid discounts on TN. Much of the rice being milled and sold during our interviews in the Delta was destined for the Ministry of Economy (MOE) which was not discounting mixed varieties. Another factor in TN variety acceptance is the increasing production of TN 20 and 22, much of which is replacing the less desirable TN-5 and 8 varieties. USAID rice production specialists estimate that about two-thirds of the 1972-73 TN crop will be the better varieties, primarily TN 20.

Drying

The timing of harvest is also changing as the less photosensitive TN varieties increase in popularity. The traditional varieties are harvested during the dry season--primarily November to February in the Delta--and drying for domestic use has not presented a real problem. Paddy is spread out on the highways, on drying floors at home, or at the mill for sun drying. While this method can result in high milling breakage and lower quality, it effectively removes excessive moisture.

3/ A gia is a volumetric measure similar to a bushel holding 20 to 22 kilograms of paddy rice.

As other researchers have noted in the Philippines (9), Indonesia (28), and Vietnam (11, 29); however, mechanical drying will be necessary for the shorter maturing, high-yielding varieties, as harvest of one or more crops is likely during the rainy seasons. Planting dates might be adjusted in some areas to alleviate part of the drying problem, but the consensus was that, in the major TN areas in the heart of the Delta, some mechanical driers will be necessary. Agricultural specialists in USAID estimated that 1 million metric tons will be harvested in 1972 during the rainy season. Some merchants and millers stated that the main reason for so much rice being fed to livestock was that it was wet and no drying facilities were available.

A critical question is how much drying capacity is needed and where. The data needed to fully answer this question were not available to the grain team, although USAID/Vietnam and MLRAFD provided some estimates of current production of TN varieties, projections by provinces, and estimates of the percentage of the TN crop that will be harvested each month in all of Vietnam (1).

A brief analysis of these data provides some insights. The 1971-72 goal for TN rice is 750,000 hectares (ha.) with an increase to 800,000 ha. in 1972-73. The majority of this hectarage is in the Delta. The 1971-72 TN production goals are 203,537 MT in MR I; 519,248 MT in MR II; 604,128 MT in MR III; and 1,813,479 MT in MR IV for a total of 3,140,392 MT. MR IV plus Long An Province in MR III account for more than two-thirds of this total. Only six provinces account for nearly one-half of the planned production: Long An, Dinh Tuong, Vinh Long, An Giang, Phong Dinh, and Ba Xuyen. In lieu of monthly harvesting data by provinces, USAID in May 1972 furnished the following estimates of monthly availability of TN paddy (1):

<u>Month</u>	<u>Percent of TN rice harvest</u>	<u>Month</u>	<u>Percent of TN rice harvest</u>
	<u>Dry season</u>		<u>Wet season</u>
December	1	June	1
January	4	July	1
February	12	August	8
March	5	September	22
April	5	October	29
May	2	November	10

These estimates were based on projections developed for the 1969-70 crop year and were the best data available to the team. Assuming these monthly estimates are equally applicable throughout the Delta (a rather heroic assumption) approximately 60 percent of the TN rice crop is harvested during August-October, the height of the rainy season in the major rice growing areas. November, with about 10 percent of the TN harvest, is usually wet but may not be in years with an early dry season. Thus, between 60 and 70 percent of TN rice production might be harvested during the rainy season when sun drying is difficult and reportedly every 1 year in 4, nearly impossible.

Translating the percentages into 1971-72 production terms would mean that between 1.8 and 2.2 million MT of TN rice will be harvested during the

rainy season with between 820,000 and 960,000 MT in just six provinces. While these estimates seem high, this brief analysis gives some idea of the potential magnitude and location of the drying problem.

In July 1972, the Rice Service, MLRAFD, provided additional but incomplete information which indicates that the drying problem associated with TN production might not be nearly so serious. Utilizing 3 years of monthly provincial data on hectares of TN planted (reported by Agr. Services) and monthly estimates of provincial rainfall and humidity (provided by USAID), the following Delta rice producing provinces were identified as potential drying problem areas: Long An, Dinh Tuong, Vinh Long, Sa Dec, An Giang, Phong Dinh, Kien Giang, and Ba Xuyen. Binh Thuan in MR II and Quang Ngai in MR I were similarly identified. However, the total rice hectareage in those 10 provinces, estimated to be harvested in the rainy months, was only 25,000 ha. in 1969-70, 58,600 ha. in 1970-71, and 105,000 ha. in 1971-72, the current season.

Thus, the information supplied by USAID in May and by MLRAFD in July yield widely different results on the need for mechanical drying at the farm level. And neither set of data is adequate to provide a basis for specifying a mechanical drying program. We established closer working relationships between USAID/Associate Director Food and Agriculture and MLRAFD/Rice Service personnel before leaving Vietnam in an effort to develop more complete and timely information on monthly rice production by provinces.

Also needed is information on the sizes and types of driers that will best suit local circumstances and who or what organization will be responsible for their financing and operation. In general, large driers are more efficient, and higher product quality can be maintained (22). In 1968, a team of USDA grain drying and storage specialists studied Vietnam's impending drying problem and recommended flat-bed driers be used (11). They concluded that this type drier offered more promise of practical operation under the Vietnamese marketing conditions because of a short harvest season in a given area, small lots, the reluctance of farmers to commingle rice immediately after harvest, and the lack of adequate power facilities in remote areas.

We recommend that the consideration of the flat-bed and batch type driers be limited to the farm or hamlet level for use when weather conditions make sun drying impossible. We believe this limitation is justified based upon experiences with these driers in the Philippines. There reportedly was a strong tendency toward single pass drying with high temperatures resulting in lower quality, or certainly more inconsistent quality paddy, with subsequent low head-yields of milled rice, than would result from sun drying under favorable conditions. Similarly, a large investment in drying equipment at the farm level needs to be based on better information. Neither the nature nor extent of current losses is known. Some USAID grain specialists think the major problem may not be drying facilities but inadequate threshing facilities resulting in extended contact of the paddy with high-moisture straw and subsequent sprouting and souring in the stacks.

For the larger mills in the commercial trade, where quality maintenance will become more important, we recommend a continuous flow drier, such as

the Louisiana State University (LSU) design, which is recognized by the trade as being a more efficient drier and one that can maintain high-quality paddy when properly operated. We assume commercial operators are more likely than farm level operators to spend the time and effort to insure that correct drying procedures are followed and quality maintained. Effective use of this type drier will require commingling of lots. However, once the paddy has entered commercial channels, this should pose no problem.

Continuous flow driers are available which can operate from a tractor power take-off or be directly motor driven. Either oil or liquid petroleum may be used, and sizes for single driers range from as low as 4 to more than 40 MT capacity removing 2-3 percent moisture per hour. These options provide the flexibility to meet most commercial requirements. Proper sizing of these driers to handle expected volumes is very important to their efficient usage. Lewis Swanson, a recognized authority on grain drying, is employed by USAID/VN and should be able to assist the GVN and commercial trade with technical guidance.

The hamlet-type drier recommended likely will be needed in production areas not convenient to rice storage or milling facilities, while the larger driers are better suited for operation in conjunction with a storage-milling center. A drying-storage-milling complex would allow farmers, merchants, and millers to take advantage of the economies of scale in all three activities by extending the milling season, increasing capacity utilization, and lowering costs, and would turn out a higher quality product. It is recommended that a limited number of each of these or similar driers be constructed and operated in the major affected provinces as soon as possible. They should be located where they will have the greatest opportunity of successful operation and serve as demonstration driers. Initial efforts to develop a drying system will likely require direct GVN assistance. Once the advantages of proper drying become evident to farmers and the rice industry, we expect the industry will purchase and operate its own equipment. The development and operation of adequate drying facilities is the key to improved warehousing, milling, and the production of a high-quality product.

Storage

Wildman quite correctly points out that introduction of the TN varieties will tend to reduce the traditional November-February peak demands for marketing facilities. Consequently, if storage and the marketing system react to these changes, less storage facilities will be needed to handle a given volume although the quality of most storage and storage management practices will need to be improved. However, Foote (8) estimated that only 27 percent of the rice production currently enters commercial marketing channels. As rice production increases, off-farm sales will increase sharply, potentially creating need for additional commercial storage, transportation, and perhaps even milling facilities.

Estimates of 1969 commercial rice storage in 24 provinces surveyed by Wildman totaled about 434,000 MT (29). Adding to this military storage

transferred to GVN by the United States, some additional construction, and warehouses in the 20 additional provinces not surveyed by Wildman, we estimate that nearly 1 million MT of total off-farm grain storage is available in Vietnam.

Sufficient flat warehouse capacity is available in the Saigon-Cholon area for present crop levels and distribution patterns, although some is currently being used for other commodities. An official of the Cereal Association of Vietnam estimated that 300,000 MT storage capacity currently exists there; Wildman estimated 240,000 MT in 1969. However, the quality of storage is not conducive to safekeeping of grains for extended periods of time. Sanitation, housekeeping, and inventory control practices will continue to deteriorate without additional investment for repairing and upgrading facilities.

It also appeared that sufficient flat warehouse capacity was located within the population centers of the deficit areas. Many of the warehouses are steel construction with concrete floors, which provides excellent storage protection if properly used. Some of this storage is located at former U.S. military facilities turned over to the GVN.

Mr. Kim, Director of Vietnam's General Supply Administration (GSA), listed approximately 118,000 MT of milled rice storage owned or leased by GSA in MR I and II. Two storage facilities on the list were visited at Da Nang. Construction was excellent, but adequate sanitation and housekeeping practices were not being followed. Losses will be larger than currently occurring if time in storage is lengthened much beyond the present rapid turnover. GSA policy, even at security warehouses, is to rotate stocks of domestic rice at least every 2 months because of its high moisture content and insect infestation. Mr. Kim also estimated 557,000 MT of commercial storage in MR IV. Wildman, in 1969, listed the MR IV commercial facilities as in fair to good condition, with probably most storage satisfactory for any grain, including rice, as long as it is bagged.

Caution is warranted in regard to the quality of Vietnam's storage facilities and the team recommends GVN further consider holding their stocks as paddy rather than milled rice. Generally, the facilities are only fair to good for dry season storage. The majority of the warehouses are old and badly in need of repair. Many have dirt floors, and only a few have adequate ventilation and offer suitable protection from rain, birds, insects, and rodents. The use of rice hulls for floor covering and continued use of unfumigated old bags make insect control nearly impossible, resulting in continuous contamination (29). Some patio drying facilities are available, but mechanical drying capacity is negligible. Also, some of the storage, particularly in MR I, II, and III, may not be located for efficient utilization. Without monthly production-utilization balances for the provinces, the extent of this problem is unknown.

Information on current costs or charges for storage is inconsistent and limited. Estimates varied from VN\$100 to 450 per MT per month for milled rice, with paddy storage about two-thirds the milled rice rates. The constant

demand for rice in the deficit areas, the limited time that domestic milled rice can be safely stored, and the high rate of interest on inventories all have encouraged a rapid flow through the system after milling. GSA's 1971 rice storage costs for milled rice, presented below, provide the best estimate:

	<u>VN\$/MT/Month</u>
Loss (insects, rodents, theft).....	196
Rent.....	88
Fire insurance.....	18
Misc. and temporary labor.....	23
Salary and wages of regular employees.....	<u>88</u>
Total.....	413

More adequate warehouse maintenance and insect control will increase costs, but the value of rice saved should be greater than the added cost. The best warehouse facilities observed in Vietnam were being operated by GSA, and their costs are probably somewhat higher than general commercial storage. However, after 30 days of free storage, monthly storage charges in Cholon were quoted as high as VN\$450 per MT. The GSA costs and Cholon charges do not reflect the costs of unloading or loading at the warehouse.

The Wildman report recommended that bulk storage facilities for 428,000 MT be built--280,000 MT in assembly facilities, and 148,000 MT in transfer or port facilities. The Wildman recommendation appeared to concentrate on developing a strong central marketing system for rapid movement of surplus grain. While the team feels that this is a worthy long-term goal, immediate efforts should stress improving quality control in existing facilities and incorporating those facilitating services that are of direct assistance to farmers and the competitive functioning of the marketing system. For a while this means bag rather than bulk storage. Rice flow in commercial channels is from the farm to the local mill, from the mill to Saigon, and from Saigon to local outlets and the deficit areas of the north. As described earlier, most paddy leaves the farm in bags or very small loose lots in sampans. Milled rice is bagged and shipped to Saigon largely in trucks and 15-200 MT junks. Bagged rice is shipped from Saigon north in coastal steamers. It is, and will remain, a bag oriented system until a number of factors change.

One major factor resisting the conversion to a bulk handling system is the Land-to-the-Tiller program. Under this program hectares in the major rice producing areas are limited to 3 ha. and the land cannot be sold by the farmer for 15 years. Thus, farm size will likely remain small, and assembly will continue to be a problem.

Some cooperatives reportedly have limited bin space but no bulk handling facilities were visited or seen in the Delta, Saigon, or the northern provinces. The drain on foreign exchange to purchase and install bulk handling equipment, the expertise needed to operate it, and the potential displacement of workers in what is normally a labor economy all support and enforce the current system. Workers generally were plentiful and wages relatively low until large-scale hostilities required a substantial drafting of men for military duty.

A cessation of hostilities and subsequent reduction in military manpower should cause a great increase in the labor supply, and some fear widespread unemployment.

Also, Vietnam's canal, river, and harbor system cannot support the larger vessels that contribute to the efficiencies of bulk handling ^{4/}. Its rail-road to the north has been heavily damaged by war and typhoons. And although a surplus of 5 to 7 MT trucks seems to exist, the highway system is not conducive to large bulk movements. More detail on the adequacy of Vietnam's transportation system and facilities is provided in a companion report by C. A. Moore (17).

Some direct shipments from the Delta ports of Can Tho and Vinh Long to Central Vietnam are planned using coasters, and this seems quite desirable, but bulk shipments are not anticipated. Containerized cargo facilities were planned for the Saigon harbor in 1972 and might be used for rice and other grains, and most importing countries can probably handle containers. Initially, however, containerized cargo will probably be limited to higher value items than rice.

The GVN, however, should plan toward eventual bulk handling of rice and other grains to realize the potential economies of scale in transportation, handling, rice milling, and feed manufacturing. As grain production increases, transportation facilities are improved, commercial livestock feeding increases, and the older rice mills are replaced by larger modern mills, bulk handling will become increasingly feasible and desirable. Bulk handling has many advantages and provides the basis for the advanced storage and marketing system suggested by Wildman. It is the grain team's opinion, however, that the adoption of such a capital-intensive mechanized system in South Vietnam would be premature at this time.

Milling

Rice mills are scattered throughout the Delta--both the small "Kiskisan" type which dehulls, mills, and polishes in one operation, and the larger "cono" type which dehulls, mills, and polishes the rice at different stages, using different machines. The larger mills, many disassembled and moved from Saigon during earlier hostilities, are used primarily for the commercial trade, while the smaller mills cater to home consumption and local trade. North of Saigon, the small mills are used nearly exclusively. The highly-prized aromatic rices may be milled by hand at home to maintain product quality.

Three types of working arrangements were noted among millers: (1) custom milling for producers and merchants, with no transfer of ownership, (2) paddy purchase for shipping milled rice to Saigon, but with no tie to particular Saigon merchants, and (3) milling operations which are owned or in some part financed by Saigon merchants. Interviews in the Delta and in Saigon confirmed that the latter practice is widespread, with individual merchants tending to specialize in certain Delta provinces. Ownership or financial involvement in 5 to 10 of the larger mills by a single Saigon merchant was not uncommon.

^{4/} Conversation with Clifford Frink, USAID/ADCCA/LOGISTICS. Saigon, March 1, 1972.

The portion of total milling capacity or total grind controlled by Saigon merchants is not known, but it appears to be a considerable part of the commercial trade. Allegedly, six to eight merchants have a controlling influence on the marketing system.

The milling charges in early 1972 ranged from VN\$180 to 250 per 100 kilograms for both the hamlet-type kiskisan mill and the larger conos. The rice owner generally keeps the bran instead of leaving it with the miller to cover his milling costs as in the past. The mills have limited storage space for paddy or milled rice, and no facilities for bulk handling or storage. Consequently, they are constantly soliciting, whether for commissicⁿ milling or purchase, and trying to ship the milled rice quickly. Most of the shipments to Saigon now go by truck because of greater security and speed. Merchants and millers with no direct ties to the Saigon merchants are particularly anxious to get their milled rice to Saigon quickly to minimize the chances of market fluctuations while in transit. Transportation costs are also a factor. Moore (17) noted that even with a 50 percent higher rate, shipment by truck may be less costly than by water. Money tied up in a 10-ton rice shipment represents foregone interest of nearly VN\$3,500 per day at current interest rates. Two days' interest will exceed the additional cost of shipping by truck from most Delta points. The limited shipments of paddy, however, which are usually owned by Saigon merchants, often move by boat.

Information is improving but still limited about the actual number, size, and location of rice mills in Vietnam. The National Institute of Statistics (NIS) indicated that 1,505 establishments were operating 1,537 licensed mills in 1968 (25). These mills produced about 1,497,000 MT of milled rice. This is equivalent to about two-thirds of the 2,208,000 MT Foote (8) estimated was milled in the 1968-69 crop year. According to NIS information, these mills operated only 1,822,000 hours during the year, or less than 120, 10-hour days per mill.

Obviously, Vietnam has more mills than those reported to NIS. If these licensed mills are representative, considerable excess milling capacity exists. This corresponds with the team's observations. Delta mills reported sporadic operation, usually working 8-12 hours per day when milling and intermittently closing for 2-4 months each year. A Saigon rice association official estimated that about 500 MT of daily milling capacity still exists in that city, and that it has been virtually idle for years.

To estimate the total milling capacity, the following procedure was used. Foote's estimate of 2,208,000 MT of milled rice minus the 1,497,000 MT of milled rice produced by licensed firms leaves about 700,000 MT produced by unlicensed mills. The amount produced by unlicensed mills was assumed to remain constant. The licensed mills were assumed capable of operating 260 rather than 120 days per year on a single shift basis and, therefore, capable of increasing output by 2.167 times. In addition, one-fourth of the licensed mills were assumed capable of operating a second shift during 130 days of the year.

Capacity Estimate of Milled Rice (000MT)	=	unlicensed (700) + licensed 1 shift (1,497 x 2.167) + licensed 2 shifts (1,497 x 1.083 x 0.25)
" " " " "	=	(700) + (3244) + (405)
" " " " "	=	4,349

Using a 62.5 percent milling yield, 4,349,000 MT of milled rice capacity would equal paddy rice milling capacity of 6,958,000 MT. Foote estimated that only 85.25 percent of paddy produced in 1968/69 was milled. Therefore, when allowance is made for utilization of unmilled rice for seed, feed, and wastage, sufficient milling capacity is now apparently available to handle approximately 8 million MT of paddy production. USAID/VN rice specialists feel that currently less than 75 percent of the crop is milled, instead of 85 percent, which would further increase estimates of excess milling capacity.

AESS estimated paddy rice production for the 1971/72 crop at 6,324,000 MT. Thus, it seems that sufficient capacity exists in Vietnam to mill a considerably larger rice crop than is now produced or is likely to be produced in the near future.

The quality of milled rice, however, is an entirely different matter, particularly if GVN should embark upon a rice export program. The larger cono mills might conceivably be adjusted to produce an export quality rice, but they are quite old and inefficient compared to mills in the United States and other major rice exporting countries. Some merchants and millers felt that, by adding additional screening equipment for removing brokens, an acceptable export rice could be produced. Others said that completely new, modern mills would be required.

There was no consensus, although the study team agrees with the latter view, particularly because of the drying problem and the strong interrelationship between proper drying and quality milling. An international rice milling consultant 5/ indicated that some improvements have become available for the "old type cono mills" like those used in Vietnam that could upgrade the cono system to export quality potential. However, he stated that the cono mills require relatively constant and difficult maintenance and that they need a good drying system to back them up to produce high-quality rice. Thus, under Vietnam conditions, it is our opinion that considerable change will be required in drying practices, sanitary procedures, and milling equipment to compete in world markets. This was recently the case in India where the restriction of competition, high milling costs, and the inability to compete in world markets were attributed to the policy of maintaining technologically outdated mills (13). Consequently, the team recommends that GVN encourage the modernization of existing facilities and the installation of mills of commercial scale and current technology.

5/ Ned Bond, Phillip Rahm Corporation, Houston, Tex.

The initial costs of operating new milling equipment will likely be higher than those currently existing because of additional costs for interest and depreciation. However, the increase in quality of rice produced, higher milling yields, and increased operating efficiency support the transition to improved equipment. Also by selectively locating larger mills at potential export points such as Saigon and Can Tho, significant economies of scale can be attained. For example, milling costs at new capital-intensive facilities in the United States were estimated to be equivalent to VN\$664 per 100 kilograms of paddy for mills with an annual volume of 22,700 MT; VN\$618 for mills with an annual volume of 45,450 MT; VN\$581 for 90,900 MT; VN\$550 for 181,800 MT and dropping to VN\$524 per 100 kilograms for mills with an annual volume of 364,000 MT (24). Cost decreased very slowly on still larger volumes. Particularly when more labor might be substituted for capital, similar economies could be expected in Vietnam.

The Saigon-Cholon Market and Training to Expand Vietnamese Participation

Cholon, the Chinese suburb of Saigon, is the center of Vietnam rice financing, storage, and trading. An open market exists for both paddy and rice, and numerous individuals are in the market. However, as mentioned earlier, six or eight Chinese merchants allegedly exert significant influence on it.

The Cholon merchants are an integral part of the national marketing system. Also, they are usually involved in more commodities than just rice. They tend to deal with one another and rely on family ties and private financing 6/. They continually assured the study team that they had sufficient capital to finance new milling equipment if the domestic market was more discriminating on rice quality and a sufficient price spread existed to justify the investment, or if Vietnam attained an export position and the new equipment were necessary. However, the current 24 to 26 percent interest rates and import restrictions on the equipment (15) are discouraging any current investment in modern equipment.

The closeness of the Chinese community and their influence on the rice marketing system concerns many public officials. Nearly all the major assemblers, mill operators, and merchants are Chinese. They have a near monopoly on the expertise that keeps the commercial system working, and it is difficult to imagine how it could function effectively without them because of the near absence of well trained and well financed Vietnamese replacements. To upgrade the marketing system, improve policy development, and encourage Vietnamese participation in the system, it is recommended that a comprehensive program in grain marketing, processing, and management be established. Four phases are recommended:

6/ For a more complete discussion see: Rice Marketing in Vietnam, a report to USAID/ADFA/Agricultural Economics, by John E. Link, May 1971.

1. Selection of Vietnamese from appropriate GVN ministries to participate in USAID grain marketing training programs. One such USAID program is conducted at Kansas State University each summer. The GVN trainees would be selected primarily for their effectiveness in organizing and conducting subsequent in-country training programs.
2. Develop an in-country training program based on the information obtained and training received at USAID training centers. Expected topics to be covered would be the grain marketing functions of buying, selling, transportation, storage, processing, standardization and grading, market information, financing, and risk. Also included should be instruction in management techniques of planning, organization, coordination and control, cost analysis, margin estimation, and market analysis.
3. In-country training sessions on the fundamental principles of economics and marketing for decision-level GVN officials concerned with grain. The primary focus would be on policy considerations and implications, with secondary efforts on management techniques required for successful grain marketing programs.
4. In-country technical assistance and management training to upgrade existing facilities and improve operating practices. These specialists would include authorities on plant layout and machinery modification for cleaning, drying, storage, milling, blending, and packaging and on warehousing and milling management. They would be available to existing firms as well as potential entrants to the grain marketing system. In addition to upgrading current facilities, they would be the liaison between industry and machinery manufacturers, domestic and foreign, so that the latest information on new equipment would be readily available to Vietnam.

Rice Prices and Marketing Margins

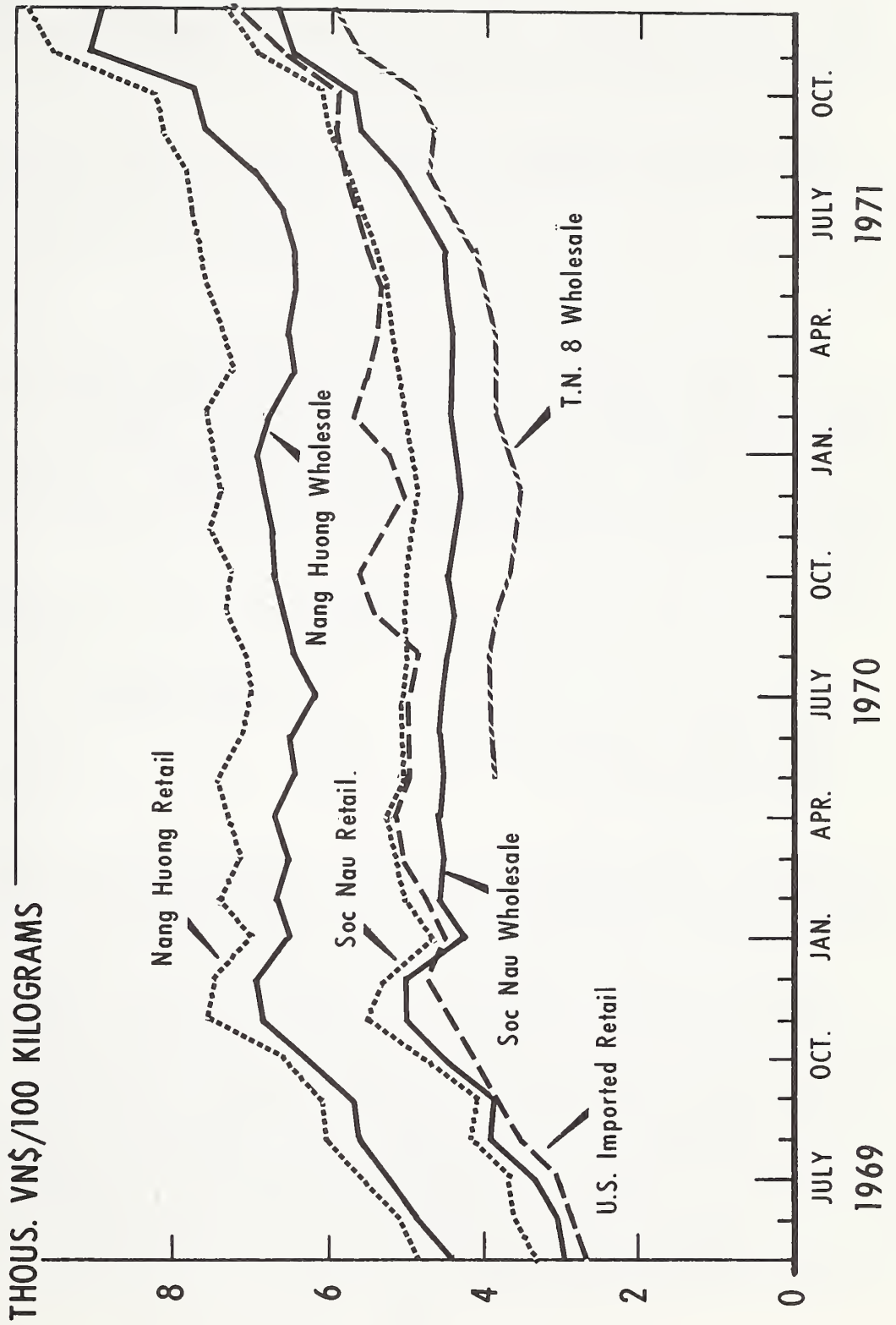
Prices and margins are analyzed only for rice. Corn, grain sorghum, and wheat are imported under special trade arrangements with the United States. Local Vietnamese prices are subject to negotiation and the GVN's control and meaningful price series are not available.

Saigon wholesale and retail rice prices 7/ from May 1969 through December 1971 are shown in Figure 2 for Nang Huong (also called Tau Huong), a highly-prized aromatic variety, and Soc Nau, an ordinary variety, with prices based

7/ USAID/JEO price data is used in this section since they are more current than AESS data and also provide a consistent quality comparison--No. 1, 25 percent broken--from the province market through Saigon wholesalers and retailers.

Figure 2

**SAIGON, S. VIETNAM : Wholesale-Retail Price Spreads of Nang Houng
and Soc Nau Rices, Wholesale Prices of U.S. Imported Rice,
and Wholesale Prices of T.N. 8**



on 15 percent broken. Also shown are wholesale prices for MT 8 and U.S. imported rice. Figure 3 shows a comparable series for Vietnamese No. 1 rice, 25 percent broken, and Delta paddy and milled rice. Note that rice prices increased substantially throughout the period. The rate of increase, however, differed among the marketing stages, causing some difficulty in estimating actual marketing spreads. Information is not available on the amounts of paddy or milled rice sold in each market. Consequently, the prices cannot be weighted to reflect actual market conditions.

A somewhat similar problem occurred in estimating marketing costs. The GVN reform announced November 15, 1971, increased the costs for labor, transportation, and other marketing inputs. The grain team visited Vietnam after the cost rises and our cost information may not reflect costs prevailing during most of 1971. Thus, one of our primary objectives--evaluating the marketing system by computing and comparing the marketing spreads and marketing costs--was not as fully attainable as planned.

We used two different time periods in estimating margins for Vietnamese No. 1, 25 percent broken. One estimate is based on the spread between the simple 12-month average annual price for Delta paddy and rice, and the comparable average prices in Saigon wholesale and retail outlets. The second is a 4-month simple average using January-April prices. The latter is the time of heavy harvest and sales by farmers, so may better reflect actual spreads, at least at the farm-mill level. The prices for each time period were:

	<u>Jan.-Dec.</u> 1971	<u>Jan.-April</u> 1971
	- - - -	- - - -
	<u>VN\$/100 kilos</u>	<u>- - - -</u>
Delta paddy, average location..	2,878	2,243
Delta rice, average location...	4,634	4,000
Saigon wholesale.....	4,818	4,134
Saigon retail.....	5,347	4,701

Converting the paddy price to 100 kilograms milled equivalent--using 62.5 percent milling yield--produces comparable milled rice prices of VN\$3,589 for the 4-month period and VN\$4,605 for the year. This gives a milling spread of VN\$29 for the year, compared with VN\$411 for the 4-month period.

The 4-month spread appears more reasonable. It is more than sufficient to cover estimated costs of unloading, weighing, and moving paddy to the mill warehouse of VN\$74 per 100 kilograms milled rice equivalent and the estimated average milling cost of VN\$200. Interest for 30 days, at an annual rate of 24 percent, to purchase, mill, and sell the rice would cost VN\$77, leaving an estimated VN\$61 profit plus the sales value of byproducts. If the miller were selling to MOE in 1971, 80 percent of the purchase funds would have been advanced him interest free, and interest costs for the balance would be relatively insignificant. Thus, during early 1971, when large volumes of rice were being harvested and sold, the custom millers and miller-merchants were apparently operating at a profit.

industry, these are modern, efficient flour mills and their recently expanded capacity of 500 MT per day is adequate to meet current flour demands. More than 50,000 MT of wheat was stored, all in bags, at the one mill visited, but there was practically no flour inventory.

Preliminary observations by the ERS farm production team indicate that wheat might compete effectively with other crops on some of the red soils in central Vietnam. If this should happen, additional storage facilities will likely be required in this area and establishing local flour mills will probably be desirable. The mills should be located convenient to both population centers and areas of livestock feeding to minimize the higher cost of handling and transporting flour and bran.

A Marketing System

No farmer marketing system exists for feed grains in Vietnam. The corn, soybean meal, and other feed ingredients are imported from the United States by the feed mills. The grain marketing team thus concludes that there is a real potential for disaster in the grain sorghum planting program. Vietnamese farmers are not familiar with producing grain sorghum, harvesting it, marketing it, or feeding it. If plantings were made early in 1972 as reported, much of the grain will be harvested during the rainy season, and drying facilities were not available at the time of the team's visit in the area. Grain sorghum is also much more difficult to thresh than rice, and only one thresher was in the area--at the grain depot in Chau Duc. We understood that additional threshing facilities, although quite limited, were made available. Our apprehensions were discussed with the USAID staff prior to our departure from Vietnam. Arrangements to assist farmers with harvesting and drying and to provide an adequate market for the first year or two are critical, or the entire program may collapse from the lack of a marketing system or demand from feed mills.

Grain Processing

A formula feed mill listing prepared by Vic Clark, USAID/ADFA, indicates an existing potential production of 845 MT per 8-hour day. He also estimated actual production at 12,000 to 15,000 MT per month. In addition, approximately 100 MT daily capacity is under construction. Thus, there appears to be a capacity to produce over 21,000 MT per month on an 8-hour per day schedule, or about double present production, and more capacity is in the planning stage, according to agricultural advisors in MR I.

Almost all of the corn used by the feed mills is imported. A total of 116,600 MT of corn was imported in 1970 and 98,500 MT in 1971. However, the imported feed grains do not totally enter commercial feed operations, since some are fed directly or enter industrial channels. A starch plant and distillery located in Cholon use imported corn, for example.

The feed mills visited by the grain team had limited storage capacity. The new mills being built were designed to provide storage equivalent to only

2 to 3 weeks of ingredient requirements. Storage will need to be expanded as local corn and grain sorghum production increases. Increased storage might be located at mills or at local assembly points more convenient to farmers. One older mill, visited in Cholon, was located in a former rice mill and was estimated to have over 2,000 MT of storage. Storage facilities at the new mills are of excellent construction and if attention is given to sanitation, quality problems should be minimal. However, live weevils were seen at all feed mills visited, and the imported corn stored at the mills was heavily infested with weevils.

Problems may occur as local feed grain production increases. High-moisture grains which would be unsafe in storage for longer than a few weeks may arrive at the feed mills, since producers may not have knowledge of or access to proper drying facilities. The possibility that small driers may become necessary for feed mill operations in specific areas should be considered.

Although the short-term demand for feed grains seems sufficient to utilize all the potential supply, export possibilities for feed grain have been mentioned by GVN and should be considered in the proposed examination of export potentials. Quality difficulties, as discussed in relation to rice exports, would not be as formidable for feed grains. Essentially, dry grain of recognizable characteristics for grading would suffice. Insect fumigation could occur prior to shipping. The physical assembly and shipping channels are currently not satisfactory for any large movements, and rural warehouses, sub-terminals, and improved port facilities will need to be considered as production increases.

FACILITATING MARKET SERVICES

A comparison of marketing margins with costs, as in a previous section, is one means of evaluating the performance of a marketing system. A second but more subjective way is to ask: Does the system move the product from the producer to the consumer at the time, in the form, and to the place the consumer wants it? By this test, the performance of the grain marketing system in Vietnam is very questionable.

Except for rice, there is practically no grain marketing system. There are no central merchandisers to buy, store, or sell corn, grain, sorghum, or even wheat. The existing rice drying and milling facilities and practices give a poor quality product unacceptable in world markets. For all grains and rice, consumers have had little opportunity to express quality preferences; they take what the system offers.

Also, there has historically been a constant crisis in bringing forth Delta rice shipments to meet demands in deficit areas. It is argued that Vietnam is at or near self-sufficiency in rice production, yet GVN involvement in procurement and distribution and substantial imports from the United States are part of Vietnam's recent rice history. Why isn't the grain and rice marketing system responsive? What can be done about it?

Certainly the hostilities, resulting insecurity, and inflation have caused farmers and others to prefer holding paddy or rice instead of money. Rice prices have risen significantly in recent years, rising faster than the average rate of inflation. However, even if these problems did not exist, the lack of facilitating services within the system would cause its performance to be less than desirable. The primary services needed initially are a market news and outlook program, development and acceptance of grades and inspection, and a means of inventory financing. An increased extension effort is also recommended to help the farmer and others to better understand how to use these services.

Market News and Outlook

Reliable and timely market news and outlook information is essential to all segments of a functioning, efficient marketing system. The need for such information is becoming increasingly apparent in Vietnam as more farmers move from a subsistence level of grain production to one of producing surpluses for the commercial market. Without knowledge of prices in local and alternative markets and the costs of getting his grain to those markets, the producer or marketing agency is in a poor bargaining position. Middlemen must increase their prices to provide sufficient margins for risk and uncertainty. Margins throughout the system widen as a result, causing higher prices to consumers.

Both GVN and USAID have recognized this need, but their efforts need to be accelerated. Interviews with AESS indicate that paddy prices are collected at mills and rice prices in provincial cities on the 1st and 15th of each month. Also, weekly wholesale and retail prices are now being collected in the Saigon-Cholon market. These prices are disseminated via radio. This is a good initial effort. However, current resources restrict the area of coverage, sample size, and timeliness. Varieties and quality of paddy and rice differ widely in Vietnam and only two types of rice are reported--"aromatic" and "traditional." The AESS and MLRAFD/Agricultural Service reporters try to price those paddies that will yield No. 1 rice, 20 percent broken. This limited coverage and lack of price-quality information greatly diminish the usefulness of the reports. USAID should continue assisting AESS in improving its reporting system.

An earlier report (10) to USAID on developing a wholesale market news service for Vietnam and the training of reporters is fully endorsed by this team, but we believe the service should be more extensive--daily wholesale prices alone are not adequate. Prices, qualities, and volume transactions at all market levels and important locations are needed. Such information would greatly strengthen competition and lessen the influence of those who currently have access to more information than others in the system.

Market news reports tell what is happening in the markets--primarily receipts and prices. Farmers, marketing agents, and government officials also need to know what is happening or is likely to happen to supply and demand. There are two kinds of production information that would help farmers and marketing agents to make decisions which would reduce price variations and

marketing margins. First is short-run information on ha. planted, yields, and production for each major type of rice and other grains in each province. Similarly, current information on the amount, quality, and location of stocks needs to be readily available. MOE, not MLRAFD, is currently responsible for assembling information on stocks. Second is the longer-run outlook information on national and international supply and price trends. Similarly, both current and longer-run estimates of domestic and foreign demand are needed if Vietnam's farmers and the marketing system are to respond effectively.

Grades and Standards

A market information service will only be partially effective without a well-understood system of grades and standards. If quality is described in different terms by each mill or merchant, or if grades lack precision and meaning, the value of price information is greatly reduced. Without established and recognized grades and standards, neither buyer nor seller can recognize prices that represent market values for different qualities. Each sale requires bargaining and visual inspection, limiting the possibility of sales in distant markets, and restricting competition. For these reasons, establishment of a comprehensive system of grades and standards and the organization of an effective market news service should proceed simultaneously. The team realizes that this will take considerable time and resources. But a well-reasoned, time-staged plan should be developed and implemented.

Grades do not exist in Vietnam for corn, grain sorghum, or wheat, and considerable confusion exists over rice grades. Official rice standards for exports existed until 1964 (22), but their current status or applicability to changed world market conditions is not known. MLRAFD officials stated in July 1972 that GVN planned to adopt some rice standards based largely upon recommendations of a United Nations/FAO rice grading and standardization committee (7). A copy of the proposed standards (16) was made available to the team and seems quite adequate if implemented and enforced. The newly created Directorate of Agricultural Economics (DAE) in MLRAFD reportedly includes a Section for both the development and enforcement of paddy and rice standards. Although we strongly recommend against DAE becoming also burdened with regulatory duties and potential conflicts of interest, it seems obvious that someone must be held accountable for so important an activity and duly encouraged to develop and maintain some meaningful standards for rice, and eventually other important grains.

Inventory Financing

Inventory financing of rice and other grains by farmers, processors, merchants, and other market agents is a critical part of an efficient marketing system. Because of the seasonal nature of production, some grain must be held in inventory for several months at some point in the marketing system. The operating capital required to finance this inventory, particularly at a 24 percent or higher interest rate, is substantial and represents an important element in total grain marketing costs. In Vietnam, these costs are currently distributed throughout the system, with farmers probably bearing the major portion.

Where needed, construction of good storage facilities, particularly at rice mills, should be encouraged and existing facilities improved so that grain losses can be reduced and quality can be maintained over extended periods of time. Loans for financing grain inventories in qualifying facilities need to be available at low interest rates and on favorable terms. In developed countries these loans are virtually risk free because they are secured by the commodity. With good storage facilities and management, the same could be true in Vietnam, giving each individual in the industry the alternative to sell or store as he saw fit, increasing competition, reducing price fluctuations, and creating a more uniform grain flow through the system. The market news and grades and standards programs outlined above are integral parts of the inventory financing program and further reduce risk and increase competition. It is recommended that a special capital loan fund be established to support a grain inventory loan program.

Extension Support

Farmers, millers, merchants, bankers, and others involved in the grain marketing system need to understand and take advantage of these services if their full potential value is to be realized. The local extension service needs to be adequately staffed and trained in the application of these supporting services. Similarly, the staff should be capable of providing current information on related grain handling and storage practices, alternative marketing methods, and GVN programs involving rice and other grains. These services and the marketing system support one another, and extension personnel should understand both and be prepared to offer accurate advice and assistance. To assist the extension staff, we recommended that they participate fully in the in-country training sessions recommended earlier in this report and make full use of the in-country technical and management specialists recommended. Additionally, a brief description of the marketing system, marketing alternatives and services, and recommended practices should be prepared for distribution to farmers and members of the marketing system.

RECOMMENDATIONS

1. We recommend that the new Directorate of Agricultural Economics devote considerable effort to improving data series on: (a) the number and location of human, livestock, and poultry populations, disaggregating livestock and poultry into appropriate grain-consuming units; (b) per capita or per head consumption of rice and other grains by humans, livestock, and poultry, including regional differences; (c) the number, type, capacity, and location of rice and feed mills, along with current operating practices; (d) the location, capacity, and quality of storage facilities; (e) the location, production, and qualities harvested, by months, of rice and other grains; and (f) the quantities, qualities, and prices of rice and other grains moving through each sector of the marketing system. Current, accurate statistics are vital to detailed analyses of alternative development actions and subsequent policies and supporting programs.

2. We recommend that immediate efforts be made to more accurately determine the nature, extent, and location of rice losses or disappearance. If inadequate drying facilities are found to be a significant factor in losses, we recommend consideration be given to flat-bed and batch-type driers but only at the farm or hamlet level. For the larger mills in the commercial trade, where quality maintenance will become more important, we recommend a continuous flow drier, such as the LSU design, which is recognized by the trade as being a more efficient drier and one that can maintain high-quality paddy when properly operated.

3. We recommend that GVN plan toward eventual bulk handling of rice and other grains. Bulk handling and a strong central marketing system will become increasingly feasible as grain production increases, transportation facilities are improved, commercial livestock feeding increases, and the older rice and feed mills are replaced by larger modern mills. It is our opinion, however, that the adoption of an extensive, capital-intensive, mechanized system such as suggested by Wildman would be premature at this time.

4. We recommend that GVN encourage the modernization of facilities and the installation of new, large, modern mills (not conos) by reducing or eliminating import barriers on desirable equipment, granting low-interest loans for this purpose, and developing a price policy that will allow Vietnamese rice to compete effectively in world markets.

5. We recommend that a comprehensive training program in grain marketing, processing, and management be established to encourage fuller Vietnamese participation in the rice and grain marketing system. A suggested approach incorporating foreign and in-country training programs and in-country technical and management specialists is outlined in the report.

6. We recommend that GVN encourage direct shipments of rice from the Delta to the deficit areas by arranging meetings of interested parties and assisting in locating and making available suitable coastal steamers. Our in-country interviews confirmed that there is interest within the industry, but that practically no communication exists between dealers in the two areas and that transportation facilities are a major problem.

7. We recommend using GVN's significant and long-range commitment to the quartermaster as an escape valve for experimenting with the international rice market. GVN may want to experiment initially on a smaller scale than required to process the full quartermaster requirement. With this in mind, we recommend that a feasibility study be undertaken to determine the best size(s), location(s), and equipment to process at a minimum 200,000 to 250,000 MT, a range being discussed as a reasonable export goal by 1975. This would give GVN a planned, time-staged program to follow, probably starting small and adding facilities as practical.

With these plans to work from, the private trade could then bid, individually or collectively, for the guaranteed income from GVN for purchasing, assembling, drying, storing, and milling specified minimum quantities of milled rice annually. The rates paid by GVN would be set high enough to

encourage private investment and management of the "demonstration" warehouses and mills. A 5 to 7-year agreement should be long enough to allow the trade to depreciate their investment and short enough to allow GVN flexibility in domestic rice policy. Once the advantages of the improved facilities are demonstrated, it is expected that the competitive pressures will move the entire industry toward a much improved marketing system.

8. Grain sorghum is a new crop to Vietnam and we recommend GVN make threshing and drying facilities readily available to farmers and arrange for an adequate market outlet. We are fearful the entire program is in jeopardy by the lack of an established marketing system and market outlets.

9. Although the near-term demand for feed grains seems sufficient to utilize the potential domestic supply, we recommend that export possibilities be considered. Quality difficulties would not be as formidable for feed grains as for rice.

10. We recommend that a comprehensive system of grades and standards and a market news service be simultaneously established. The team realizes that it will take considerable time and resources to do this. But a well reasoned, time-staged plan should be developed and implemented. Reliable and timely market news and outlook information is an essential service to all segments of a competitive and efficient marketing system. This includes a well-understood system of grades and standards, for, without this, a market information service is only partially effective. The need for such information will increase as more farmers move from a subsistence level of production to one of producing surplus for commercial markets. Both GVN and USAID have recognized this need, but their efforts should be accelerated.

11. We recommend establishment of a special capital loan fund to support a grain inventory loan program. Because of the seasonal nature of production, some grains must be held in inventory several months. At 24 percent or higher interest rate, the cost of capital to finance inventories is substantial and an important element in total marketing costs. With good storage facilities and management, the loans would be virtually risk free because they would be secured by the commodity.

12. We recommend that the extension service help educate farmers, millers, merchants, bankers, and others to better understand the marketing system. Unless these people understand the system and its services and take advantage of them, full benefit of the system will not be realized. Local extension service personnel should participate in the recommended in-country training program so they can offer accurate advice and assistance. We also recommend that this report be translated and made available to extension workers so they can have a better perspective of the current grain marketing system, its problems, and opportunities for improvements.

PRODUCTION-DISTRIBUTION MODEL COEFFICIENTS

In addition to the marketing system analysis just discussed, the grain marketing team was asked to develop capital requirements and costs for "model" plants to be included in a production-distribution model being developed in another phase of the overall ERS/USAID Vietnam project. These plants included a formula feed mill, rice mill, flour mill, and grain depot unit. The units were cost standardized to reflect "average" type plants that would be applicable throughout the country. They should not be considered feasibility study proposals since specific locations are not considered.

Model Assumptions and Costs

Numerous assumptions are made in the development of the following model plants. Many sources were used to develop model plant requirements and costs. Major assumptions and cost estimates are documented whenever possible.

Land and site preparation costs are not included in the budgets since variations among location made this cost impossible to estimate with any reasonable accuracy. Land cost ranges from zero in the free industrial parks to thousands of dollars per hectare in the Saigon-Cholon area.

Equipment and facility requirements were derived by reviewing previous reports by other teams, talking with Government officials, and visiting several areas to determine the needs and potentials for these model plants. In some instances, the model size and operations may not appear to be the most feasible under U.S. standards. However, in developing countries such as Vietnam, it is necessary to make certain concessions with regard to efficiency.

Basic equipment and facility specifications are described. The kind, type, size, and number of equipment items required for each model plant have been established with the assistance of equipment manufacturers. Each plant has the capacity to produce more than is assumed. Increased capacity largely depends on good management, as well as a favorable combination of other factors.

Model plants are designed to utilize bulk movement within the operation where feasible. However, because of certain conditions, all receipts and shipments were considered to be in bags.

Labor requirements were determined by discussions with equipment manufacturers and managers of similar types of operations in existence. Maximum efficiency is not the prime consideration in developing a work force. With the low labor rates, labor is used in lieu of capital investment. Plant wage rates per worker were standardized at VN\$1,000 per day with a conversion rate of VN\$400 to U.S. \$1. Wage rates were obtained from the National Institute of Statistics.

Depreciation rates for equipment and facility were set at a useful life as suggested by equipment manufacturers and comparable to similar manufacturing facilities in Vietnam. Useful life may be shorter or longer depending upon operating care and preventive maintenance and obsolescence.

Utility rates are based on utility costs obtained from the National Institute of Statistics. Utility requirements for electricity, water, sewage, etc., were estimated from discussions with equipment manufacturers and other knowledgeable sources in Vietnam.

Repairs and maintenance have been estimated from suggestions of equipment manufacturers, construction firms, and others with similar types of manufacturing operations. This will vary considerably depending upon the preventive maintenance program initiated.

Interest rates used for both long-term investment and short-term capital were estimated from the rates paid by other manufacturers in Vietnam. This rate could change with the exchange rate in existence.

Taxes and insurance were estimated from the operating experience of comparable firms. The same estimation procedure was used for several other cost items such as office supplies, other miscellaneous costs, and administrative costs.

In some cases it was necessary to use relations and experience of similar U.S. firms. This method of estimation was used as the last alternative. In most cases, however, the costs involved are of a minor role and would have little influence on the magnitude of total costs.

Formula Feed Mill

The estimated annual operating costs for the formula feed milling operation are shown in table 3. The cost estimates reflect the capacity estimate of a 50 M.T. per 8-hour day feed mill. The mill was assumed to operate 260 days a year. Approximately eight formula feed rations would be manufactured, with tonnage divided equally between poultry and swine feeds. All feeds were produced in mash form.

Variable Operating Costs

The annual variable operating costs for the formula feed mill included mill wages and salaries, utilities, repairs and maintenance, supplies and materials, interest on working capital, and other miscellaneous costs.

The plant wages and salaries were based on an average daily wage of US\$2.50 per day for the 260-day year. The total was based on the use of 23 full-time workers for the 8-hour per day operation.

The utilities cost was based on a KW per hour rate of 4 cents and included estimated water and sewage use costs.

Repairs and maintenance can vary yearly. The cost shown was standardized at 10 percent of equipment cost.

Table 3.--Estimated annual costs for 50 M.T. per day formula feed mill in Vietnam.
Production-Distribution Model

Item	US dollars	VN piasters <u>1/</u>
A. <u>Operating costs</u>		
1. Wages and salaries.....	14,950	5,980,000
2. Utilities.....	8,000	3,200,000
3. Repairs and maintenance.....	3,500	1,400,000
4. Supplies and materials.....	1,000	400,000
5. Interest.....	1,950	780,000
6. Other.....	150	60,000
Subtotal.....	29,550	11,820,000
B. <u>Fixed costs</u>		
1. Administration.....	7,000	2,800,000
2. Office costs.....	3,000	1,200,000
3. Depreciation.....	10,000	4,000,000
4. Taxes and insurance.....	3,550	1,420,000
5. Interest.....	21,300	8,520,000
6. Other.....	100	40,000
Subtotal.....	44,950	17,980,000
TOTAL.....	74,500	29,800,000

1/ 400 piasters equal 1 dollar.

Supplies and materials included various plant supplies. Major items were sacks, thread, grain fumigants, and petroleum supplies. The sack and thread costs were only for those used internally for storage. The sack costs were figured on a 5-time reuse basis.

Interest cost was assessed for working capital use of payroll, ingredients, and supplies. An interest charge of 2 percent per month was used. A 2-week supply of ingredients, finished product, bags, and other supplies was assumed. Payroll costs were for a 1-week period.

Other miscellaneous costs were approximately half of 1 percent of operating costs.

Fixed Costs

Annual fixed costs for the formula feed mill included administrative salaries and expenses, office costs, depreciation on buildings and equipment, taxes and insurance on facilities, interest on capital investment, and miscellaneous other fixed costs.

The annual administrative cost was computed at US\$7,000. The relatively high interest rate of money in Vietnam justifies paying higher than normal wages for the manager so that he could be expected to work full-time at the feed mill and effectively manage the investment.

Office costs included bookkeeping and clerical salaries, utilities, telephone, office supplies, depreciation on office equipment, and related expenses.

The depreciation costs were based on straight-line schedules and average useful life of 25 years on buildings and 12-1/2 years on equipment. The total of buildings and equipment depreciation is shown.

Taxes and insurance were charged at approximately 2 percent of the original cost of the building and equipment. The usual charge for a plant of this type is about 1 percent, but Vietnam was assumed to pose greater uncertainty.

Interest on the facilities was charged at an annual rate of 24 percent on the depreciated value of buildings and equipment. The depreciated value was taken at half of the original cost of facilities.

Other miscellaneous costs were figured at approximately one-fourth of 1 percent of fixed costs.

Total Costs

The building and bins cost US\$104,000. The equipment including installation and spare parts was estimated at US\$73,500. Sixty percent of the total US\$177,500, or approximately US\$106,500, was assumed to require foreign exchange.

The total estimated annual operation costs of US\$74,500 shown in table 3, divided by 80 percent of yearly capacity, reflects a cost of US\$7.16 per M.T. The per ton cost is lower than estimates of U.S. operations (27) primarily because of differences in labor and inventory costs.

INVESTMENT DETAIL

Facility

1. Warehouse and milling building: Metal with concrete floor.		
Warehouse (60' x 100' x 16') = 6,000 ft ² @ \$7/ft ²		\$42,000
Milling (60' x 40' x 20') = 2,400 ft ² @ \$7/ft ²]		34,800
basement (60' x 15' x 8') = 900 ft ² @ \$20/ft ²]		
		<hr/>
		\$76,800
2. Office: Metal with concrete floor.		
Office 15' x 30' = 450 ft ² @ \$10/ft ²		\$ 4,500
3. Bins: Metal		
Two grain bins 100 T capacity @ \$4,000		\$ 8,000
One grain bin 50 T capacity		2,500
Two soft ingredient bins 50 T capacity @ \$2,500		5,000
Two soft ingredient bins 30 T capacity @ \$2,000		4,000
Three working bins 8 T capacity @ \$500		1,500
Three mash bins 8 T capacity @ \$500		1,500
		<hr/>
		\$22,500
	Total	\$103,800

Equipment

1. Receiving:		
Three platform scales 0.5 T @ \$250		750
One inclined screw conveyor 20 T/hr 9" x 20"		800
One scalper 20 T/hr		900
Two receiving pit 10 T @ \$650		1,300
One screw conveyor 20 T/hr 9" x 30'		1,000
One bucket elevator 20 T/hr 6" x 5" x 80'		2,500
One distributor 7-hole, 8" spout		350
One platform hand truck		100
Two bag hand trucks @ \$70		140
		<hr/>
	Total	\$7,840
2. Processing:		
One feeder screw conveyor 6 T/hr 6" x 40"		800
One feeder screw conveyor 6 T/hr 6" x 30"		600
One hammer mill with collecting system 6 T/hr		5,400
One 3-way valve 8" spout		100
		<hr/>
	Total	\$6,900

3. Mixing:		
Three discharge feeder screws 20 T/hr 9" x 15' @ \$750		\$2,250
Two discharge feeder screws 20 T/hr 9" x 30' @ \$900		1,800
Two discharge feeder screws 20 T/hr 9" x 20' @ \$800		1,600
Two weigh buggies 0.5 T @ \$500		1,000
Two mixers 2 T, vertical @ \$1,250		2,500
One feeder screw 20 T/hr 9" x 20'		800
One scalper 20T/hr		900
One feeder screw 20 T/hr 9" x 20'		800
One bucket elevator 20T/hr 6" x 5" x 50'		2,000
One 3-way valve 8" spout		100
		<u>\$13,750</u>
4. Packing:		
One bagging scale -gravity model, 20 & 40 kilos		\$1,000
One bag conveyor & sewing machine		1,500
Two bag hand trucks @ \$70		140
One platform hand truck		100
		<u>\$2,740</u>
5. Office:		
General		\$2,000
6. Miscellaneous:		
5 percent of total equipment costs		<u>\$1,750</u>
	Total	\$34,980

Installation

Mechanical, electrical, millwright 100 percent of equipment cost \$34,980

SUMMARY:

Facility	\$104,000
Equipment	35,000
Installation	35,000
Spare parts (10 percent of equipment)	<u>3,500</u>
TOTAL	\$177,500

Rice Mill

The estimated annual operating costs for the rice milling facility are shown in table 4. The cost estimates reflect a capacity estimate of 40 M.T. per 10-hour day rice mill. A yearly operating total of 260 days was assumed. The milling unit is based on the latest technology in the industry and can manufacture rice to meet international standards and grades at high milled rice yields.

Table 4.--Estimated annual costs for a 40 M.T. per day paddy rice mill in Vietnam.
Production-Distribution Model

Item	US dollars	VN piasters <u>1/</u>
<u>A. Operating costs</u>		
1. Wages and salaries.....	11,700	4,680,000
2. Utilities.....	7,700	3,080,000
3. Repairs and maintenance.....	8,800	3,520,000
4. Supplies and materials.....	800	320,000
5. Interest.....	1,100	440,000
6. Other.....	150	60,000
Subtotal.....	30,250	12,100,000
<u>B. Fixed costs</u>		
1. Administration.....	6,000	2,400,000
2. Office costs.....	2,500	1,000,000
3. Depreciation.....	14,680	5,872,000
4. Taxes and insurance.....	4,600	1,840,000
5. Interest.....	27,600	11,040,000
6. Other.....	140	56,000
Subtotal.....	55,520	22,208,000
TOTAL.....	85,770	34,308,000

1/ 400 piasters equal 1 dollar.

Item headings comprising variable and fixed operating costs are the same as listed in the formula feed budget.

Variable Operating Costs

The mill wages and salaries were based on an average daily wage of US \$2.50 per day for a 260-day year. The total number of workers for the 10-hour per day operation was 18.

Utilities cost was based on a KW per hour rate of 4 cents and included estimated water and sewage use costs.

Repairs and maintenance costs were standardized at 10 percent of equipment cost.

Supplies and materials cover similar items as those listed in the formula feed mill budget.

Interest cost was assessed for working capital use of payroll, rice stocks, and supplies. An interest charge of 2 percent per month was used. A 2-week supply of paddy rice and other items was assumed but payroll costs were estimated for only a 1-week period.

Other miscellaneous costs were approximately half of 1 percent of operating costs.

Fixed Costs

Administrative costs were budgeted at US\$6,000 to pay expenses and salary of a full-time manager and assistant.

Office costs included bookkeeping and clerical salaries, utilities, telephone, office supplies, depreciation on office equipment, and related expenses.

The depreciation costs included both building and equipment costs. They were based on straight-line schedules and average useful life of 25 years on the building and 12-1/2 years on equipment.

Taxes and insurance were charged at approximately 2 percent of the original cost of the building and equipment.

Interest on capital investment was charged at an annual rate of 24 percent on the facilities' depreciated value, which was calculated at half the original cost of the facilities.

Other miscellaneous costs were figured at approximately one-fourth of 1 percent of fixed costs.

Total Costs

The mill building and storage area cost US\$93,000. The equipment, including installation and spare parts, was estimated at US\$137,000. Seventy-five percent of the total US\$230,000, or \$172,500, was assumed to require foreign exchange.

The total estimated annual operating costs of US\$85,770 shown in table 4, divided by 80 percent of maximum yearly capacity, reflects an approximate cost of US\$10.31 per M.T.

INVESTMENT DETAIL

Facility

Building: Metal with concrete floor	
Overall building dimension 60' x 203' x 16'	
Warehouse 60' x 113' = 6,800 ft ² @ \$7/ft ²	\$47,600
Milling: bldg. 4,136 ft ² @ \$7/ft ²	29,000
basement pits 364 ft ² @ \$20/ft ²	7,280
Office 15' x 25' = 375 ft ² @ \$10/ft ²	3,750
Lab 15' x 35' = 525 ft ² @ \$10/ft ²	5,250
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Total	\$92,880

Equipment

1. Receiving:	
Three platform scales 0.5 T @ \$250	\$750
Two bag hand trucks @ \$70	140
One platform hand truck	100
Two storage bins 30T capacity @ \$2,000	4,000
One inclined screw conveyor 20T/hr 9" x 20'	800
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	\$5,790
2. Processing:	
One Satake Type 4 unit No 4048	\$75,000
3. Packing:	
One feeder screw conveyor 20T/hr 9" x 30'	\$1,000
Two bagging scales gravity model @ \$1,000	2,000
Two bag conveyors & sewing machines @ \$1,500	3,000
One hull bin 10T capacity	700
Three bag hand trucks @ \$70	210
One platform scale 0.5T	250
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	\$7,160
Total	\$87,950
4. Office	
General	2,000
5. Laboratory	
General	2,150
6. Miscellaneous	
5 percent of total equipment cost	4,850
	<hr/>
Total	\$96,950

Installation

Only approximately 50 percent of mill equipment cost is estimated due to package unit construction and millwork \$40,000

SUMMARY:

Facility	\$93,000
Equipment	97,000
Installation	<u>40,000</u>
TOTAL	\$230,000

Flour Mill

Estimated annual operating costs for the flour milling operation are shown in table 5. The cost estimates reflect the capacity estimate of a 200 M.T. per 24-hour day flour mill. The mill was assumed to operate a total of 260 days a year. Both bakery and family type flours would be manufactured. Storage capacity for wheat would consist of concrete silo type totaling 10,000 M.T. Bagged wheat would be received at the site by truck. Finished product would be bagged and then picked up by wholesalers at the mill site.

The item headings listed in the variable and fixed operating budget are the same ones that were included in the formula feed mill budget.

Variable Operating Costs

Plant wages and salaries were calculated on an average daily wage of US\$2.50 for 75 workers for 260 days.

Utilities cost was based on a KW per hour rate of 4 cents and included estimated water and sewage costs.

Repairs and maintenance costs were estimated at 10 percent of equipment costs.

The cost of supplies and materials included mill items for internal use such as sacks, fumigants, and petroleum supplies.

An interest charge of 2 percent per month was assessed for working capital use for payroll, wheat, and other materials. A 1-week payroll charge was used. Because wheat is imported, an inventory charge of one-fourth of total storage capacity or 2,500 M.T. was used. Finished products were assessed for 1 week.

Other miscellaneous costs were approximately half of 1 percent of variable operating costs.

Table 5.--Estimated annual costs for 200 M.T. per 24-hour day wheat flour mill in Vietnam.

Production-Distribution Model

Item	US dollars	VN piasters <u>1/</u>
<u>A. Operating costs</u>		
1. Wages and salaries.....	48,750	19,500,000
2. Utilities.....	91,520	36,608,000
3. Repairs and maintenance....	60,000	24,000,000
4. Supplies and materials.....	4,000	1,600,000
5. Interest.....	8,400	3,360,000
6. Other.....	1,060	424,000
Subtotal.....	213,730	85,492,000
<u>B. Fixed costs</u>		
1. Administration.....	20,000	8,000,000
2. Office costs.....	8,000	3,200,000
3. Depreciation.....	98,350	39,340,000
4. Taxes and insurance.....	42,000	16,800,000
5. Interest.....	252,000	100,800,000
6. Other.....	1,050	420,000
Subtotal.....	421,400	168,560,000
TOTAL.....	635,130	254,052,000

1/ 400 piasters equal 1 dollar.

Fixed Costs

The administrative cost was estimated at US\$20,000.

Office costs included standard budget items and additional expenses for import requirements, sales costs, and quality control laboratory.

Depreciation costs were based on straight-line schedules and average useful life of 40 years on the mill and storage facilities and 15 years on the equipment.

Taxes and insurance were standardized at 2 percent of the original cost of the buildings and equipment.

The interest charge was 24 percent a year on half of the original cost of facilities.

Other miscellaneous costs were estimated at approximately one-fourth of 1 percent of fixed costs.

Total Costs

The mill building and silo storage cost US\$1,000,000. Equipment including installation and spare parts was estimated at US\$1,100,000. Ninety percent of the total US\$2,100,000, or US\$1,890,000, was estimated to require foreign exchange.

The total estimated annual operating costs of US\$635,130 shown in table 5, divided by 95 percent of maximum yearly capacity, reflect a cost of US\$12.86 per M.T. The per ton cost is lower than estimates of U.S. operations (18) primarily because of differences in labor and packaging costs.

INVESTMENT DETAIL

Facility

1. 10 grain storage silos, each 20' diameter x 140': concrete capacity 10,000 tons	\$600,000
2. Mill building, 135' x 130' x 90': concrete cleaning/milling/finished products	<u>400,000</u>
Total	\$1,000,000

Equipment

Machinery, accessory parts (conveyors, spouting, etc.) motors, control panels, cables including installation and erection.

1. Storage 120 T/hr capacity	150,000
2. Cleaning and milling section 200 T/24 hr wheat	825,000
3. Finished products	100,000
4. Miscellaneous	<u>25,000</u>
Total	\$1,100,000

Installation

Included in the equipment estimates for a package 200 T/24 hr wheat mill.

SUMMARY:

Facility	1,000,000
Equipment including installation	<u>1,100,000</u>
TOTAL	\$2,100,000

Grain Depot

A grain assembly and merchandising facility similar to the community grain depot concept developed by USAID/Vietnam was budgeted. The purposes of the unit are to collect, thresh or shell, dry, store, and prepare the local grains for shipment to consumption areas. Additionally, distribution of farm inputs such as seeds, fertilizer, insecticides, and other needs would be carried out to utilize labor and building space while adding to revenue.

The total estimated annual operating costs of the depot are shown in table 6. Variable operating and fixed costs were divided between four operations. The threshing and shelling unit was designed for feed grains and can handle 2 M.T. per hour. It was estimated to process 1,000 M.T. per year. The cleaning and drying unit will clean at the rate of 6 M.T. per hour and dry at 4.5 M.T. per hour. It was estimated to handle 3,000 M.T. per year. The storage and handling operation was estimated to handle three times the 1,000 M.T. warehouse capacity for a total also of 3,000 M.T. per year. Finally, the sales and distribution of farm inputs was estimated to be approximately 400 M.T. per year. Receipt, storage, and shipment of grain was assumed to be in bag.

Variable Operating Costs

The annual variable operating costs for the grain depot were comprised of the same item headings as previous mill costs with the addition of a shrinkage cost for the cleaning-drying and storage-handling operations.

Budgeted wages and salaries were based on a plant crew of 12 men plus additional part-time help when required.

Shrinkage charges reflect losses in volume that can be expected in a grain drying and storage facility. The standardized rates used were 0.4 percent for cleaning and drying, and 0.5 percent for yearly storage and handling volumes.

Fixed Costs

The total annual administrative cost was estimated at US\$2,400. Half of this amount was budgeted to storage and the remainder to the other functions.

Depreciation costs were based on straight-line schedules and average useful life of 25 years on the building and 8 years on the equipment.

Total Costs

The building cost US\$60,000. Equipment was estimated at US\$20,000. Forty percent of the total US\$80,000, or US\$32,000, was assumed to require foreign exchange.

The total estimated annual operating costs of US\$38,900 shown in table 6 are divided between the four operations.

Table 6.--Estimated annual costs for 1,000 M.T. capacity grain depot in Vietnam.
Production-Distribution Model

Item	Thresh- ing Shell- ing	Clng.- drying	Storage- handl.	Sales distr.	Total	
						VN <u>1/</u> dollars
						US dollars
A. Operating costs						
1. Wages & salaries.....	345	3,450	3,800	245	7,840	3,136,000
2. Utilities.....	250	1,875	250	125	2,500	1,000,000
3. Repairs & maintenance:	100	800	1,000	100	2,000	800,000
4. Supplies & materials.:	50	150	350	450	1,000	400,000
5. Interest.....	0	0	2,680	1,320	4,000	1,600,000
6. Shrinkage.....	0	960	1,200	0	2,160	864,000
7. Other.....	0	35	50	15	100	40,000
Subtotal.....	745	7,270	9,330	2,255	19,600	7,840,000
B. Fixed costs						
1. Administration.....	120	240	1,200	840	2,400	960,000
2. Office costs.....	40	80	400	280	800	320,000
3. Depreciation.....	700	1,900	1,625	625	4,850	1,940,000
4. Taxes & insurance....	80	400	800	320	1,600	640,000
5. Interest.....	1,345	3,840	3,170	1,245	9,600	3,840,000
6. Other.....	0	20	20	10	50	20,000
Subtotal.....	2,285	6,480	7,215	3,320	19,300	7,720,000
TOTAL.....	3,030	13,750	16,545	5,575	38,900	15,560,000
M.T. handled.....	(1,000)	(3,000)	(3,000)	(400)		
Cost per M.T.....	3.03	4.58	5.52	13.94		

1/ 400 piasters equal 1 dollar.

The threshing-shelling operation has high costs per M.T. when costs are allocated between depot services since the volume is estimated to be only 1,000 M.T. The unit is more of a service to producers allowing them either to custom thresh or commercially market grain that has been harvested by cutting heads or husking.

The cleaning-drying operation was estimated to cost more than estimates of similar operations in Panama (21). However, interest costs account for almost 60 percent of fixed costs, and combined with the relatively high fuel and power costs in Vietnam, would account for the difference.

The storage-handling operation estimates include high interest charges both in variable and fixed costs. Interest charges comprise more than 37 percent of total storage-handling costs.

The sales and distribution of farm inputs operation should return a profit at the cost and volume shown. This operation is complementary to the other operations since it uses labor and space not normally required during off-season drying and storage periods.

INVESTMENT DETAIL

Facility

Grain Depot: Brick with metal roof and concrete floor	
Enclosed area (80' x 170' x 16') - 13,600 ft ² @ \$4/ft ²	\$54,000
Roofed area only (80' x 30' x 12') = 2,400 ft ² @ \$2/ft ²	<u>4,800</u>
Total	\$59,200

Equipment

Depot area:	
Two platform scales 0.5T @ \$250	500
Two bag hand trucks @ \$70	140
Two platform hand trucks @ \$100	200
One scalper cleaner with spouting 6T/hr	800
One inclined screw conveyor 6T/hr 6' x 10'	350
Three batch dryers 1-1/2 T/hr @ \$4,000	12,000
Two threshers 1 T/hr @ \$2,000	4,000
One sheller 2T/hr	650
One portable sewing machine	1,000
One bagging stand	150
Miscellaneous items	<u>200</u>
Total	19,990

SUMMARY:

Facility	60,000
Equipment (no installation, all portable)	<u>20,000</u>
TOTAL	\$80,000

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