REPORT ON
PRELIMINARY SURVEY ON CONSTRUCTION OF SILO SYSTEM
AT THE PORT OF SURABAJA

PREPARED BY

THE TECHNICAL ADVISORY TEAM TO THE MAIZE PROJECT IN EAST JAVA

INDONESIA

MAY 1972

OVERSEAS TECHNICAL COOPERATION AGENCY

FOREWORD

Four years have already elapsed since Japan embarked on the cooperation project for the development of maize production in East Java. During this period, production in the project area showed a marked upward trend parallel with the progress of the cooperation efforts. As a result, the stage has now been reached for implementing Bimas Palawidja, a project formulated by Indonesian government for the development of upland crops.

If maize is to become an export crop of East Java with sufficient international competitive power, improvement of its distribution system is just as essential as its accelerated production. For this reason, studies have been made in the past years on the possibility of rationalizing its distribution by constructing silos at the port of Surabaja, the main export port in East Java.

The present preliminary survey, which will be followed by a detailed survey at a later date, was conducted to collect basic data and information on the production and distribution system of maize, silo management, and port facilities.

This report was prepared from the results of the said preliminary survey, and I hope that the information it contains will be found useful by the parties concerned.

I wish to express my deep gratitude to the competent authorities of the Indonesian Government, Japanese experts participating in the maize development project in East Java, the staff of Japanese Embassy in Djakarta, and other agencies and organizations for the valuable assistance extended to the technical advisory team.

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May 15, 1972

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II. INTRODUCTION

The present preliminary survey was conducted to study the validity of constructing a loading silo system as a means of improving the export mechanism and securing outlets for the increasing production of maize in East Java. It goes without saying that the validity of the silo system construction and export mechanism improvement should be measured against the yardstick of market expansion and the consequent promotional impact on maize production which remains at a rather stagnant level in East Java.

It is an accepted principle of economics that the expansion of production does not hold where there is no increase in demand, and demand becomes effective only through pricing. It follows, therefore, that the construction of the loading silo system will not have any promotional impact on maize production unless maize is made sufficiently competitive on the international market in parallel with the improvement of its production structure and distribution system.

Accordingly, this survey was made to clarify the existing state of maize production in East Java, domestic maize consumption and distribution system; to study the economic advantages which would derive from the loading silo system; and to bring to light the conditions to be fulfilled for its construction.

While these questions call for studies made from various different angles, the present survey was carried out with emphasis placed on the following:

1) To analyze such factors as the economic significance of maize production in farm household economy, domestic demand for maize, and price problems; and to clarify the possibility for expanding maize export and the conditions required to achive this.

2) To study the distribution system and costs and to pinpoint the improvements required in the existing distribution system for the introduction of the loading silo system.

3) To study loading costs at ports and analysis of the effects of the loading silo system from the standpoint of cost and quality of maize.

4) To select a suitable construction site in East Java for the loading silo system.

5) To determind the type of organization necessary to insure most efficient management in the event the loading silo system is constructed.

In the following pages, these points will be taken up in clarifying the possibilities for the construction of the loading silo system. It should be noted here that the survey team was unable to attain fully satisfactory results due to the limited survey period and lack of reasonable data.

As reference for the future progress of the accelerated maize production project, some analysis and proposals are attached in the appendix.

III. ECONOMIC ASPECTS AND EXPANSION POSSIBILITIES FOR MAIZE PRODUCTION IN EAST JAVA

Whether the export volume of maize to be stored in silos will maintain a sufficiently high level in the future is one of the prime questions to be solved in studying the construction project of the loading silo system. To solve this question, the economic factors and the importance of maize production in farm household economy must be made clear.

As shown in Table 1, maize production in East Java accounts for about 41% and 56%, respectively, of the production of the whole archipelago and Java island (Madura inclusive). It leaves no doubt that East Java is the largest maize producing area in the country. This large production share of East Java is considered due, on the one hand, to the fact that maize is grown not only as the farmers' staple food but also to meet the demand from urban areas, and, on the other, to the crop rotation in which maize carries a heavy weight due to natural and farm management conditions. In this sense, maize produced in East Java may be said to be almost devoid of the nature of a commercial crop, particularly export crop.

With the exception of a few large estates, agriculture in this province is supported by small holders having an average operational land area of as little as 0.7 ha. Farmland expansion has nearly reached the limit, and it is next to impossible to find new arable land today. Since the farmers' economy has a strong tinge of self-sustenance, their economic footing is just too poor to afford commodities, particularly agro-inputs. In the prevailing farm household economy of East Java, conditions are lacking for expanding production through accumulation of funds.

If maize production is to be accelerated against such an unfavorable background, firstly the planted area of maize should be expanded within the existing farmland area, and secondly the production per hectare should be augmented. Expansion of planted area and improvement of land productivity, as considered from the viewpoint of agricultural techniques, hinge on the market price and production cost of maize. In other words, the attainment of these two improvements depends largely on the size of the added value of maize. Though farmers still adhere to a self-sustaining agriculture, it is known that their aspirations for larger profits and income are becoming increasingly greater. If the added value of maize is to serve as a strong motivation for production increase, it should be not only large enough in absolute value but also capable of convincing farmers of the advantage of maize over other crops.

Production of maize in East Java in the 1960's is shown in Table 2. This table indicates that the harvested area has been subject to an extremely large fluctuation and that the production per hectare has maintained the same level with a slight decline observed in some years. The fluctuation of harvested area may be ascribable to the effects of natural conditions, but it is considered that the fluctuation appearing in annual statistical data occurs because the main harvesting season extends over two calendar years. The poor unit production is believed to have resulted from the decline in soil fertility, which makes maize less advantageous compared to other crops thereby causing the farmers to show a lack of enthusiasm for production increase, and also from the lack of any adequate soil conservation policy. It cannot be

denied that these two minus factors are a clear manifestation of the economic features of maize. A typical example of the econonic features of maize can be seen in the case where local varieties (such as Kretek) are grown instead of improved varieties (such as Metro and Harapan, which have a growth period about 2 weeks longer compared with local varieties) to shorten the growth period and obtain a larger annual income.

An analytical study on the earning power of maize reveals the facts given below. Various surveys and statistics indicate that production runs about 0.8 tons per hectare under traditional farm management which is virtually devoid of capital goods input. The producer's price varies substantially depending on the demand-supply situation and local conditions, but Rp 14,000 - 15,000 can be safely taken as the standard producer's price per ton if maize is delivered in dried grains with a water content of 17 - 18%. Therefore, the value of production per hectare turns out to be approximately Rp 11,000 - 12,000. With the growth period assumed at an average of three months, the value of production would run somewhat lower than Rp 4,000 per hectare. Since the value of agro-inputs can be almost disregarded as stated above, this value shows a close approximation to the agricultural income. (But the rent and cost of employed farm labor should be subtracted from this value to obtain the farmer's income.)

If converted to the value per average operational holding of 0.8 hectare of small holders, this monthly income drops to a slightly more than Rp 3,000. This means that an owner-farmer with the said operation holding who grows maize throughout the year by family labor alone will be earning an annual income of only Rp 40,000. Though its accuracy cannot be substantiated due to the lack of statistics, this value is less than two-thirds of the average farmer's income which is considered to range from Rp 60,000 to Rp 70,000. Further, if this value is studied with reference to the incomplete data of production and prices of other crops, it becomes clear that maize is not a very profitable crop in East Java. Hence, the farmers' claim that in order to maintain livelihood, the floor price of maize should be set at Rp 14,000 per ton can be justified.

In view of the above, it is imperative to improve land productivity and expand planted area for the purpose of increasing the profitability of maize production. As explained at length in the Appendix, the experience gained in the maize project area of East Java shows that the production can be increased to at least 2 tons per hectare by the input of 200 kg of urea and the introduction of improved varieties. If the price is assumed to be constant, this production increase will provide an added value of about Rp 23,000 per hectare, which makes maize fairly profitable in relation to other crops.

It is to be noted, however, that the take-off from the traditional farming practices for more profitable maize production will be accompanied by the introduction fertilized culture of other crops. The resultant increase in the revenue from other crops will make the relative profitability of maize production not sufficiently high. Table 3 shows just a local example and does not present the situation of fertilized culture in entire East Java. The production per hectare and price shown in this Table are those of major crops grown by fertilized cluture in a village situated near Kediri city. Calculation of added value cannot be worked out because the production cost is not known, but judging from the monthly revenue, it can be said that the relative profitability of maize production is not very high.

As described above, maize production under the existing small holder system will remain stagnant or pursue a downward trend by reason of its poor profitability unless there is some possibility of a rise in price. It is probable, however, that it will maintain the past level because maize is a crop supported by the farmers' own consumption and domestic demand and is included in the crop rotation because of farm management conditions. Production in future will therefore hinge on the transition of unit production for the most part, and this will be largely affected by the farmers' positive desire for production increase and the agricultural policy that supports it.

In this study of the loading silo system project, it is necessary to assess the future prospect of production because it provides the basis for maize export from East Java. Insofar as can be judged from the relative profitability and administrative supports over the past years, it must be considered that maize production in this province will continue to remain stagnant in future. However, since the scale of cultivation will be maintained on the same level, efforts should naturally be made for increasing agricultural income by improving land productivity within that scale.

As things stand now, farmers in East Java lack both techniques, and funds for expanding production. Therefore in order to improve farming techniques and economic basis, strong administrative measures are required. While huge Treasury loans and investments will be needed chiefly for fertilizer supply, the scale of Indonesia's national finance renders it practically impossible to expect that the Government's financial support for agriculture will be augmented at a rapid pace. Furthermore, it is believed that a considerably long time will be required before the climate for increased agricultural production is created through extension of improved techniques and other means.

When these conditions are reviewed, it becomes clear that a considerably long time will be necessary before maize production is increased to the extent that it provides a constant surplus for export. Considered from the viewpoint of production alone, therefore, it would not be too late to introduce the loading silo system after the production is increased to the said extent.

IV. MARKET PRICE AND EXPORT TREND OF MAIZE

A study of the export volume of maize must be based on an analysis of production and domestic demand as well as on a review of the relationship between domestic and international market prices, the decisive factor that determines the export volume. Price fluctuation affects not only international competitive power but also production and domestic consumption. In reviewing price fluctuation, three different kinds of prices i.e., farmers' net sales price, domestic market price including distribution costs, and export price including expenses, must be considered in relation to production, domestic demand and export demand, respectively.

By assuming that the distribution and export costs are constant, the following two propositions can be established.

Firstly, if the price rises, it invites production increase, cuts down domestic consumption and thereby provides a larger supply for export.

Secondly, if the price declines, it provides larger international competitive power and thereby expands export demand.

In either case, the converse is also true. The fundamental problem facing export promotion is how to maintain balance between these conflicting propositions. Hence, the price problem is the decisive factor that determines export volume.

The following is an analysis of domestic demand.

Staple food in East Java is composed chiefly of rice, maize and cassava. According to a detailed survey conducted by Mr. T. Shimizu, a marketing expert of the maize project team in the province, consumption of these foods averaged 57% for rice, 32% for maize and 11% for cassava in the total staple food consumption in urban and rural areas combined. These three staple foods can be substituted by each other, so that their consumption rate varies according to the level of income and price. Since Indonesians, excluding the inhabitants of Madura, have a greater preference for rice than for other staple foods, it is highly probable that rice will take the place of maize and cassava and show an increase in per capita consumption with the elevation of income level and with the production increase and resultant price drop of rice. Similarly, escalation of international market price of maize and consequent rise in domestic maize price will result in heavier consumption of rice or cassava.

There are no data that can be used as the basis for measuring price flexibility, but income flexibility in the demand for rice and maize, as calculated with the cross section data obtained from the results of a survey on the food consumption trend in the 1964 - 1965 period, is as hown below.

Urban area:	rice	log D =	444 + 0.72 log Y	$r_2^2 = 0.98$
	maize	log D =	14,698 - 0.54 log Y	$r_2^2 = 0.72$
Rural area:	rice	log D =	40,092 + 1.14 log Y	$r_2^2 = 0.99$
	maize	log D =	4,323 - 0.21 log Y	$r^2 = 0.71$

Note: D - Per capita consumption per week (In gr)
Y - Per capita consumption per month (In Rp)

While the flexibility for rice shows substantially high positive values, that for maize is negative, with a conspicuous decline in per capita consumption attributed to the improvement of income level particularly in urban areas.

Since the annual growth rate of per capita real income in the national economy showed a low level of 0.25% in the 1960's it is considered that the rise in the income level will not have any notable effects on the consumption demand in future. In the case of maize, the decrease rate of its per capita consumption will be negligible because of the extremely low growth rate of per capita income. Total domestic demand, on the other hand, is likely to follow an upward rather than downward trend, supported by the high population growth rate of about 2.5%. Accordingly, it cannot be expected that the decrease in domestic consumption resulting from the improvement of income level will contribute much to the expansion of surplus supply for export.

The question then arises as to how and through what mechanism maize should be exported from East Java. This question cannot be put to an accurate and rigid analysis because it is only seven years since maize began to be supplied to overseas markets in appreciable quantities from East Java, though its export was initiated soon after the country's independence. Table 4 shows the trend of maize exports over these seven years. As the Table indicates, the export volume has fluctuated considerably (spring crop of 1972 was not exported partly because of the drop in international price), and the fluctuation is closely related to the international market price (C & F Japan price) but has little or no relations with the fluctuation in production. In other words, the export volume increased with the rise of C & F Japan price. (Note: C & F price is not necessarily an adequate indicator since it includes freight.) On the contrary, increase in domestic production produced practically no effect on the expansion of export volume. An attempt was made to analyze these relationships by means of an econometric model, but the results obtained involved large errors due to the small number of samples and therefore failed to meet the purpose of analysis. However, insofar as the correlation coefficient involving price and production is concerned, it should be noted that the price coefficient is extremely high whereas that for production shows virtually no correlation.

The limited number of samples made it difficult to arrive at an accurate judgment, but it may be said that the expansion of exports cannot be expected from production increase unless accompanied by a reduction in FOB price (in which freight is assumed to be constant). Within a given short period, production increase will naturally lower the domestic market price and the resultant increase of international competitive power will bring about export promotion. However, such decline in domestic market price will not provide real hope for export promotion since it will dampen the farmers' desire to seek production increase in the subsequent production period. The international market price is the largest factor that determines the export volume. Export promotion cannot be expected unless profitable production is realized on the basis of the international market price. In other words, maize cannot become a stabilized export crop of East Java unless its marketability ceases to be marginal, i.e., ceases to depend on the fall in international market price.

Over the past ten years, C & F Japan price has been subject to a substantial fluctuation but ranged from US$60 to US$65 per ton in most cases.

If the lower limit of this C & F price, US$60, can be maintained, then East Java maize can find stable outlets in Japan. The freight in this C & F price now ranges from US$12 to US$15 if regular liners are used, but this can be reduced to US$8 to US$10 by using tramp liners. If the freight is reduced to US$8, the FOB price will drop to US$52. Under the existing export system, the government collects 10% of the FOB price as export duty and 3% as sales tax and stamp duty. Further, under current commercial practices, 5% of FOB price is paid for quality assurance. This means that export maize is shipped at US$42 - 43 per ton which is equivalent to about Rp 17,500 at the new Rupiah - Dollar exchange rate after dollar devaluation. Since the costs for drying, distribution and shipment amount to about Rp 8,000 at present as described earlier, the producer's price is about Rp 10,000. This is about Rp 4,000 lower than the aforementioned floor price of Rp 14,000 claimed by farmers. Hence, it is evident that the international competitive power of East Java maize was poorer before dollar devaluation.

In the above calculation, consideration is not given to the reduction of domestic distribution costs; export duty, cost of shipment, etc. Increase in producer's price must be accompanied by a reduction of these costs if East Java maize is to have a sufficient competitive power on the international market. Up to the present time export maize has been shipped mostly to Singapore and Hongkong because these markets are more or less isolated from the international maize trade by reason of the size of consumption and level of quality and also because freight costs are cheap. For future expansion of export volume, both quality and price must be improved so that maize can be supplied to overseas markets as a competitive international commodity. Construction of the loading silo system will meet this purpose as it will cut down the freight by bulk maize transportation using tramp liners and also serve to eliminate the 5% discount system by quality improvement. It is to be noted, however, that the silo system can fully display its functions only if its construction is accompanied by systematic improvement of production structure, distribution mechanism and taxation policy, etc., and should not therefore be evaluated on the above-mentioned merits alone.

V. DISTRIBUTION MECHANISM AND COST, AND THEIR IMPROVEMENT

With regard to the distribution route through which maize is purchased from farmers and shipped for inter-regional or international export as well as the cost and margins incurred in this route, a detailed description is given in a report prepared by the aforementioned marketing expert, Mr. Toshio Shimizu, on "The Distribution Mechanism and Cost of Maize in East Java". Since the present survey produced essentially the same findings on these points as presented by Mr. Shimizu, the discussion in this chapter will be limited to explanation supplementing the said report.

With the exception of a small fraction of the total maize distribution volume which is delivered by farmers in payment of loans advanced to them under the maize project in East Java and collected and exported by the agricultural cooperative society, maize distribution is in the hands of merchants who are mostly Chinese. The basic pattern of distribution is as illustrated below.

Producers---Village Middlemen---Brokers in Local Cities---
---Wholesalers/Exporters in Large Cities

Naturally, producers often sell directly to wholesalers/exporters in large cities. In the case of domestic consumption, maize is distributed to consumers or retailers directly from producers or through one of the collecting stages. Before the harvested maize is supplied in dried grains for export or domestic consumption, husking, primary drying (for decreasing water content to 17 - 18%) and secondary drying (for decreasing water content to 14 - 15%) are required (primary drying and secondary drying are occasionally conducted at the same time, and no secondary drying is required for domestic consumption). Husking and primary drying are carried out by producers or village middlemen or brokers in local cities, whereas secondary drying is undertaken either by brokers in local cities or whoelsalers/exporters in large cities.

Village middlemen are not always full-time merchants and can be found in substantially large numbers in each village. Hence, it is believed that both their business scale and the volume of maize they handle are small. Brokers in local cities are found in large numbers in different localities and their business scale varies considerably. Most of them possess drying yards and warehouses, depending on the volume of agricultural products they handle, and some operating on a large scale have drying yards covering an area of several thousand square meters and warehouses with a capacity of several thousand cubic meters. These large-scale brokers often employ several tens of workers.

Exporters of agricultural products belonging to the Exporters' Association of East Java (GPEI) number 67 (approval for export business is limited to members of this Association).While about half of these 67 members are engaged in the export of maize, there is a wide gap between them in the scale of business, with four of them occupying a dominant share in the total export volume. Past data indicate that an export of 20,000 tons of maize was recorded by one of the four major brokers. Though some of these maize exporters have warehouses near the port area and also have drying machines, most of them make maximum use of free warehouses to cut down the high cost incurred by the use of pier

warehouses. Since the collecting system introduced above is not organized except for a small portion, transaction is carried out between sellers and customers freely selected by each other according to the price condition, and there are enterprises in Surabaja which specialize in offering information and data for streamlining transactions.

As regards the distribution cost and margins, there is no choice but to resort to a rough estimation because of the diversity and local differences in the distribution route and degree of processing (i.e., whether maize is supplied in fresh ears or grains and the extent of drying) and also because of the complex problems ecountered during the survey. Since maize is sold at different degrees of processing, the calculation of cost and margins worked out below is based on the assumption that husking is conducted by producers, primary drying by brokers in local cities, and secondary drying by exporters in large cities.

Village middlemen purchase maize directly from the farms and deliver it to the collecting place (mostly to brokers in local cities). Their gross income is estimated to be about Rp 1,500 per ton of grain. If they purchase fresh maize ears from the farmers and process them into dry grain before delivery, their income naturally increases by the amount equivalent to the processing cost. Margins which can be earned in this distribution stage are not very large. In addition to the purchase of harvested maize crop, however, transactions with farmers are often based on the payment of advance money or advancement of living and production funds against the prospective maize crop. In such cases, the gross income is a substantially large amount because the middleman offers harvesting labor. Particularly in the latter case in which loans are advanced at a high interest rate, the profit is quite divergent in nature from the ordinary margin, and the profit margin between the payment to farmers and the sales price to the broker is quite large. Even in this case, however, the profit margin goes mostly to the brokers in local cities if they are the source of funds.

Brokers in local cities generally purchase maize from village middlemen and sell it to wholesalers/exporters in large cities. In most cases, they bear the necessary inland transportation cost. This transportation cost will be referred to elsewhere in this chapter. The gross income of these brokers can be estimated to amount to about Rp2,000 per ton, which includes the cost of primary drying and storage undertaken by them. Since primary drying is conducted mostly by solar drying, the necessary direct cost is considered small including the low labor cost. As described previously, however, capital input is required for the construction of drying yards and storage facilities according to the handling volume. Indirect costs covering the depreciation expense and interest on these facilities is therefore estimated to account for a large portion of the cost of primary drying and storage.

Exporters in large cities purchase maize at a price including inland transportation cost and store it over a certain period, during which they carry out secondary drying and fumigation as the need arises, and ultimately ship it via port warehouses. Excluding the export expenses incurred after delivery from pier warehouses, their gross income is considered to be a little more than Rp 2,000 per ton. Direct costs included in this gross income cover the temporary warehouse charge of Rp 3 per ton per day (approximately the same cost will be required even if they have their own warehouses), transportation

charge of less than Rp 50 from the temporary warehouse to the port warehouse, cost of secondary drying (which is not known though it must be higher than the primary drying cost because a drying machine is employed), and fumigation cost of Rp 250. The remainder of the income is the margin including indirect costs.

It is generally said that the inland transportation cost is Rp 10 per ton.km. By the introduction of bulk transportation, however, the actual cost is made somewhat lower than this. Since the distance between Surabaja and major maize producing areas, such as Malang and Kediri, is 100 - 150 km, it can be considered that the cost is less than Rp 1,000 per ton on the average. As for ship-loading expenses, the current rate of port warehouse charges is Rp 16.5 per ton per day and that of ship loading charges from warehouses is Rp 777. Hence, the total expense is also below Rp 1,000. The cost of jute bags differs largely depending on whether maize is shipped in bags or bulk, but on the average Rp 700 - 800 is sufficient.

The route of transaction and the processing (such as husking and drying) are very diverse, making it difficult to classify these into set patterns. However, a generalization based on the aforementioned costs and expenses makes it possible to set the cost of distribution from the producer to the completion of shipment at about Rp 8,000. Needless to say, about 13% export duty and sales tax must be added to this value to obtain the actual FOB price. In the total price incurred up to shipment, the distribution cost accounts for a little less than 40%, and this percentage is subject to change according to fluctuations in export price. In other words, rises in export prices increase the rate of distribution cost because the distribution margin is more flexible than the producer's price. The above mentioned Rp 8,000 is a fairly reasonable amount in relation to the distribution cost of other agricultural crops. This is due to the competition among the numerous maize merchants. Since the interest rate in Indonesia is extremely high as is the case in other developing countries, the opportunity cost, and profit rates of private capital are inevitably quite high not to mention the cost of interest. Therefore, assuming that there is no major error in the above calculation of distribution costs, it cannot be said that excessively large profits are being earned in the distribution sector.

The foregoing does not imply that there is no room for rationalizing the distribution mechanism or cost. Improvements in processing and in the distribution system are not only possible but essential, particularly for the introduction of the loading silo system.

With regard to the improvement of the distribution mechanism, studies must be made on two fundamental aspects, i.e., reduction of cost and elevation of quality level. Since these two aspects are closely interlocked, a solution of the problems involved will directly lead to the improvement of the distribution mechanism.

As for the distribution cost, it should be noted that the principle of scale economy applies to the distribution channels. In East Java, the scale of both producers and distributors is extremely small. Where the collection of products is conducted on a small scale, the margin rate is necessarily high in order to secure income. If large-scale collection of maize is introduced in this province, therefore, the rate of the distribution margin can be reduced. The principle of scale economy also applies to the cost of inland as well as

marine transportation. In this case, however, a reduction in the number of distributors is required to increase the distribution volume and consequently production, and efforts must be made to avoid monopolistic competition that could arise from enlarged scale of handling.

Reduction in distribution costs involves the problems of external economies. It will require a considerably long time to solve these problems because they are closely related to the socio-economic structure of Indonesia. To cite a few of such problems, high capital cost is caused by the prevailing high interest rates, and deficient infrastructural improvements observed particularly in roads, ports and harbors, and communication and storage facilities are causing high distribution costs and at the same impeding quality improvement and expansion of distribution.

Quality improvement, on the other hand, calls for breeding and introduction of improved varieties and improvements in farming techniques in the production sector, and for improvements in the preparation process involving husking, drying, storage and fumigation in the distribution sector. As regards husking, the method currently practised is very primitive and inefficient, increasing the cost and making it difficult to obtain grains of uniform and good quality. Improving the husking method is therefore one of the most urgent needs today. Drying is conducted chiefly by solar drying, which is considered to be the most efficient existing method. Since quality cannot be assured without drying and suitable storage facilities, sufficient numbers of new drying yards and warehouses should be installed throughout the producing areas. Additional installation of warehouses would also facilitate fumigation.

As described already, the distribution sector at present is completely in the hands of private enterprises. It should be pointed out that the fostering and greater utilization of agricultural cooperative societies are prerequisites for the development of agricultural production and the correction of the existing defects mentioned above. The system of agricultural cooperative societies has now been established with PSUKOPERTA and PRIMKOPERTA organized under GAKOPERTA, but none has made any appreciable achievements due to the complete lack of governmental financial support. If these cooperative societies are backed up by the government support, chiefly the provision of loans at a low interest rate, and their functions are fully utilized, it will be possible for them to play an active part in the reduction of distribution cost and the elevation of quality, and also to strengthen the mutual confidence and relations between them and the farmers. Needless to say, the role of private enterprises which are currently engaged in maize distribution should not be eliminated. Rather, efforts should be made to achieve improvement and rationalization of the distribution mechanism through competition between the private enterprises and the agricultural cooperative societies.

In introducing the loading silo system, the following improvements should be made in the existing distribution system, particularly in the transport pattern of maize.

The purpose of silo construction is to reduce the distribution costs for maize and at the same time to improve its quality. Loading from silos will not pay unless a large quantity of maize is handled each time and empty silos are filled with sufficient quantities of maize before the next shipment.

In other words, the economic advantage of the loading silo system lies in large handling volume and high silo utilization rate. Hence, the distribution system from the producing area to the port must be improved to meet such demands. Further, since large quantities of maize are to be ultimately loaded in bulk, it is evident that the distribution cost can be reduced if maize is stored and transported in bulk and not in jute bags.

The existing distribution system is far from satisfactory to meet these requirements. Setting aside the need for handling maize in bulk, the survey team considers that the following three improvements are imperative for the introduction of the loading silo system.

Firstly, large capacity storage facilities should be established either in the producing areas or between the producing areas and the port so that maize can be readily transported and filled in silos. In this case, installation of country elevators or the like is desirable if the maize is in bulk.

Secondly, large numbers of trucks should be provided to facilitate mass transportation of maize from storage facilities to the silos. In this case, the economic advantages of railway transportation as well as the facilities for bulk transport should also be taken into consideration.

Thirdly, the efficiency of husking and drying processes should be raised to make possible the speedy collection of large quantities of maize (secondary drying can be done in the silos). For this purpose, other required facilities must be constructed at the same time.

As is clear from the above, the introduction of a loading silo system involves changes in the whole export system and must be accompanied by improvements in the entire distribution system in order to achieve its purpose, In other words, it should be noted that a partial improvement which is limited to the construction of silos alone will not suffice.

Table 1

(1968)

	Harvested area thousand ha	Production (grain) thousand ton
West Java	162	195
Djakarta Raya	1	15
Central Java	724	732
D.I.Djogjakarta	45	31
East Java	1,409	1,281
Java and Madura total	2,342	2,255
Sumatra	126	120
Kalimantan	17	13
Sulawesi	503	465
West Irian	7	7
Nusa Tenggara	274	243
Indonesia total	3,269	3,102

Java and Madura Total

	Harvested area thousand ha.	Production thousand ton
1967	1,732	1,686
66	2,746	2,781
65	1,762	1,708
64	2,775	2,889
63	1,863	1,750
62	2,353	2,451
61	1,823	1,706
60	1,929	1,793
59	1,677	1,475
58	2,106	2,012
57	1,556	1,309
56	1,702	1,431
55	1,578	1,462
41	2,229	2,433
40	1,983	1,900
39	2,030	1,985

(Source) Indonesia Statistical Data

Table 2

	Harvested area thousand ha.	Production (grain) thousand ton	Average production kg/ha
1962	1,341	1,070	797.9
63	1,128	1,031	914.0
64	1,575	1,358	862.2
65	1,111	950	855.1
66	1,620	1,351	834.0
67	1,303	1,088	835.0
68	1,420	1,025	721.8
69	1,037	698	673.1
70	1,322	875	661.9

(Source) East Java State Statistical Data

Table 3

Kind of Crops	Cultivate Period month	Production ton/Ha.	Local Price Rp/kg	Gross Revenue per month Rp
Rice	5	4.2(Dry-unhalled)	17 - 25	14,300 ~21,000
Maize	3	3.0 4.0 (grain)	15 - 17	15,000 ~22,700
Peanuts	3	2.0	40 - 60	26,700~40,000
Soybean	3	1.0	60	20,000
Chili	9	2.0 3.0	90 - 100	20,000~33,300
Onion	2	5.0 7.0	46	115,000~16,100
Sugar cane	11 16	8.0 12.0	100	50,000~111,000

(Source) Kediri, Bulupasar (Desa)

Table 4

	Export from E. Java thousand ton	C & F Price Japan US$	Production in E. Java thousand ton
1966	24.3	68.6	1,351
67	62.3	66.8	1,088
68	1.6	60.0	1,025
69	107.2	60.7	698
70	115.4	73.0	875
71	103.5		

VI. EXISTING STATE OF PORTS AND HARBORS IN EAST JAVA

Blessed with rich natural resources, Indonesia supplies various products such as tobacco, natural rubber, Kapok, etc. to the world market (See Table 5) via seaports. In East Java, all these products are exported from Surabaja port.

Table 5 - Export of Major Products from East Java

	1970	1971
Rubber	17,612 ton	16,664 ton
Coffee	16,739 "	12,545 "
Tobacco	13,286 "	13,503 "
Maize	184,549 "	131,779 "
Tapioca	192,285 "	218,486 "
Copra Chips	94,973 "	113,105 "
Molasses	130,499 "	232,970 "
Others	149,615 "	196,051 "
Total	799,558 ton	935,103 ton

Source: Department of Trade, East Java Province.

Improvements in port facilities, however, have been unable to keep pace with the rapidly increasing cargo volume resulting from the sharp export growth observed in recent years. In an attempt to cope with this situation, the Government has drawn a program in the expansion of ports and harbors and seeks to strengthen the country's economic infrastructure by implementing this program.

The maize exporting ports covered by the present survey are Surabaja and Banjuwangi in East Java. (Panarukan was excluded from the scope of survey since a bridge on the road to the port had been washed away by heavy rainfall.) Of these two ports, Surabaja is equipped with berthing facilities, but cargo handling at Banjuwangi depends on lighter service.

Table 6 - Export Volume from East Java by Port

	1970	1971
Surabaja	714,450 ton	864,314 ton
Probolinggo	4,414 "	3,790 "
Panarukan	35,488 "	26,384 "
Banjuwangi	45,206 "	40,581 "
Kalianget	50 "	35 "
Total	799,608 ton	935,104 ton

Source: Department of Trade, East Java Province.

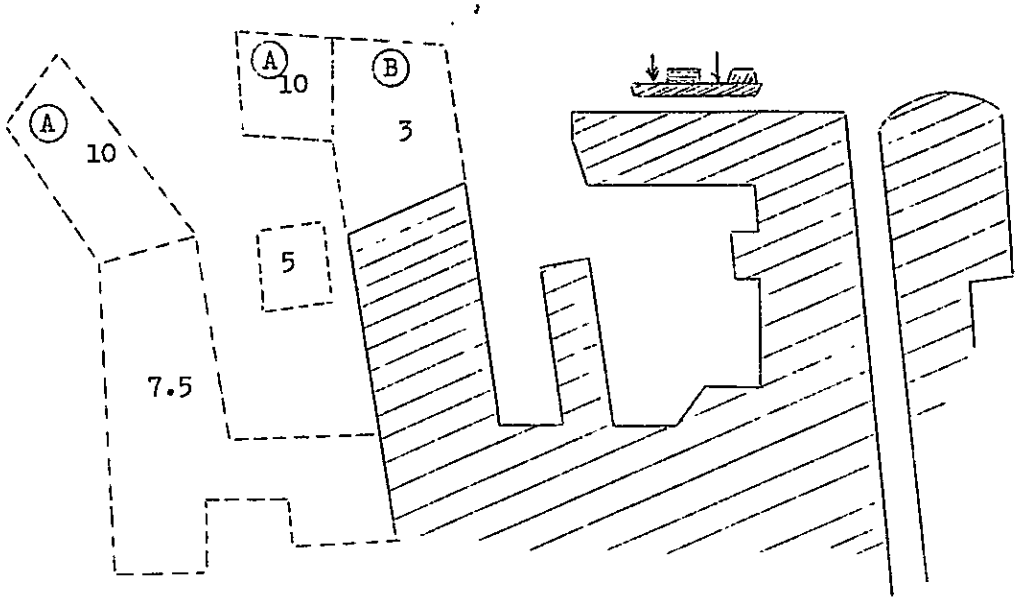
As shown in Table 6, export products of East Java are shipped from Surabaja and four other ports, with Surabaja occupying a dominant share of 90%. Regular export procedures are followed at these ports; namely, exporters submit export declarations to the customs authorities and upon approval the goods are transported to pier warehouses from where they are loaded directly on carriens berthed along the pier or by means of lighters in the case of carriens offshore. The survey team was informed that the daily cargo handling capacity ranges from 800 to 1,000 tons, but the actual capacity appears to be somewhat lower than this.

Surabaja port is featured by extremely soft soil conditions and the harbor area is subjected to an annual inflow of 6 million m^3 of silt from the Karimas River. The silt discharged into the port is desposited to a thickness of 20 to 30 cm each year, requiring dredging operations once a year. The water depth ranges from 8 to 9 m in the deepest part which is the main berth for export cargo carriers. A shipping company explained that the berth was capable of accommodating 14,000-ton class vessels, but the team felt that it was suited for 10,000-ton class vessels. Water depth along other parts of the coastline is about 7 m which is too shallow for berthing ocean -going vessels. The port area is occupied almost wholly by state-operated and private warehouses and dockyards with virtually no open space remaining.

At Banjuwangi port, cargo handling work is conducted solely by a state-operated company. As described already, cargoes are handled offshore about 500 m from the coast where two 10,000-ton class vessels can be moored to buoys for simultaneous loading and unloading work. However, since lighters must be used, the cargo handling efficiency of this port is rather low. At present, the construction of a new port capable of berthing 10,000-ton class vessels is in progress at a location about 3 km from the existing Banjuwangi port. The survey team was informed that the local people expressed a strong desire for the introduction of the silo system at this new port. It was learned that, perhaps because of the abundant availability of surplus land, they were prepared to cooperate fally and to offer the land area required for the silo construction. Unfortunately, however, although the local people have shown a great deal of enthusiasm, the site of the new Banjuwangi port is not suited for constructing silos since it is too far from the major maize producing areas like Kediri and Malang.

From the existing state of port facilities explained above, it is considered that Surabaja port is suited as the site for silo construction because it is not far from Kediri and Malang districts and is also favored with relatively good road transport conditions. However, Surabaja port does not have the land area required for silo construction. The survey team is therefore of the opinion that a detailed study should be made of the construction of the loading silo system when the ports and harbors improvement program of the Indonesian Government is brought to completion.

Fig. 1 - Expansion Plan of Surabaja Port



To construct silos with a capacity of 20 thousand tons and to allow 15,000-ton class vessels to be berthed, a land area of at least 10,000 m^2 (20 m x 50 m) and a water depth of 10 m must be secured. When these requirements are considered, Area A shown in Fig. 1 is most suited as the construction site for silos. However, if Area A is not acceptable because it will require 10 years for its completion under the said expansion flow, then the second priority should go to Area B. Silos, particularly concrete silos, are semi-permanent structures. Hence, sufficient studies must be made prior to their construction.

VII. ECONOMIC ADVANTAGES OF LOADING SILO SYSTEM

A reduction in export costs calls for streamlining the complex distribution mechanism as well as mechanization and rationalization of cargo handling work. Construction of silos at ports is one means for this purpose. Needless to say, silos are three-dimensional warehouses intended exclusively for storing bulk cargoes. Since they are capable of storing large quantities of grains in a limited space, they have been constructed in many countries of the world including the U.S.A. and Japan. However, if silos are not operated properly, their merits would be impaired and the cost of loading silo operations would become higher than that incurred by other storage facilities. Hence, caution must be excercised in the operation and management of silos.

(1) Merits of Silo Utilization

In an attempt to clarify whether silos will fully display their merits after their construction, a simple calculation of the costs incurred in the route from free warehouses in the city area to shipment was worked out, taking into account the existing state of maize distribution in East Java. It is to be noted here that the rates of silo charges currently effective in Japan were adopted in the calculation although it was recognized there might be a slight discrepancy. This is due to the fact the rates to be adopted for the proposed loading silo system cannot be readily obtained because they must be determined on the basis of the fixed expenses (depreciation costs, interest, tax on the acquisition of immovable property, real estate tax, insurance premium, repairing cost) and variable expenses (lobor cost, fuel cost, electricity charges, etc.). It should also be added that the charges of warehousing work are those agreed upon between the clients and warehousing companies and reported to the supervising authority, and the loading changes are those approved by the Ministry of Transportation.

The calculation was besed on the following.

(a) Case A (charges obtained by interviews)

Free warehouse in city area → Pier warehouse → Carrier	
Charges for warehousing work into (delivery from) free warehouses	Rp 100/ton
Storage	Rp 3
Charges for warehousing work into pier warehouses	Rp 100
Storage	Rp 16
Loading charges	Rp 777
Case B ($1 = Rp 415 = 305 yen)	
Silo → Carrier	
Charges for warehousing into silo	Rp 219 (208 yen)
Storage	Rp 10
Loading charges	Rp 301

(b) Since maize can be loaded on the carrier in bulk even if silos are not used, bulk loading was assumed for both Case A and Case B.

(c) As for the storage in Case B, the rates effective in Japan were originally planned to be employed. However, due to the marked discrepancy between the Japanese and Indonesian rates, the median of the storage fee charged by free warehouses and pier warehouses was taken to attain a close approximation to the actual silo charges.

Calculation of silo charges based on the above conditions is shown below.

Case A: Rp 100 (warehousing) + Rp 3 x 20 days (storage) + Rp 100 (delivery) + Rp 100 (warehousing into pier warehouse) + Rp 16 x 10 days (storage) + Rp 777 (loading) = Rp 1,297

Case B: Rp 291 (warehousing into silo) + Rp 10 x 30 days (storage) + Rp 309 (loading) = Rp 900

As is clear from the above calculation, Case B is cheaper by about Rp 400/ton and clearly indicates the merits of silo utilization. The calculation was made on the assumption that well dried maize grains would be collected and carried into silos. Therefore, if facilities for drying maize before loading into the silos are constructed along with the silos, then the storage charges would naturally become that much higher.

Utilization of silos is generally considered to produce the following merits.

(a) Quality can be maintained at a constant level over a long period. Maize should be dried to a water content of less than 15% before loading into the silo, and if the temperature of maize grains rises beyond the temperature, inside the silo, blowers should be turned on for cooling.

(b) Fumigation is complete can be done with ease.

(c) Loading time can be cut down by the use of loading machines.

(d) Trampers can be chartered to cut down freight charges.

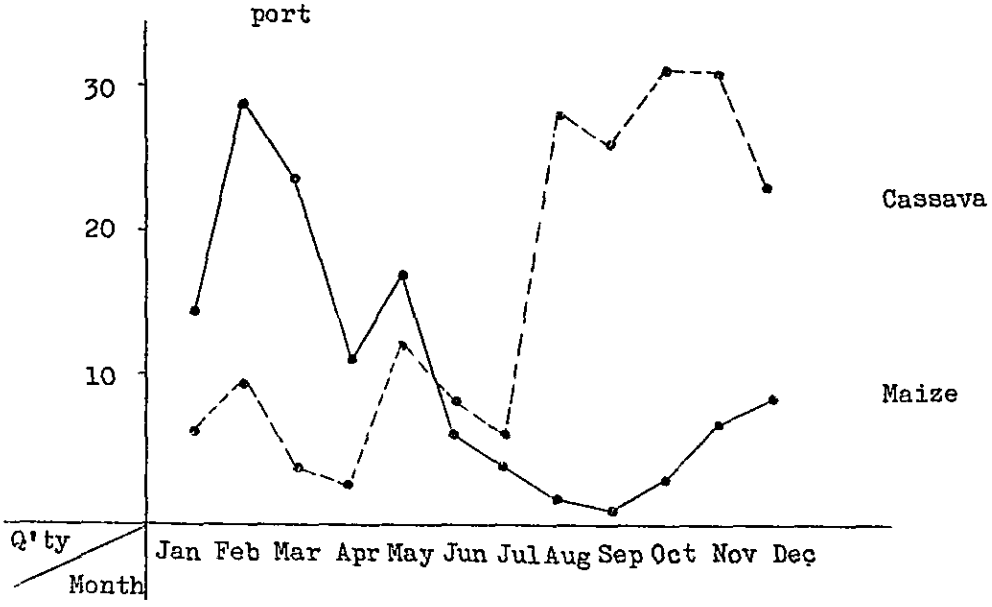
It is said that if the freight of liners from Surabaja to Yokohama is 14 dollars per ton, that of trampers would be about 8 - 10 dollars. Although the freight of trampers is unquestionably cheaper than that of liners, it varies according to the class of the vessel, availability of cargo on return voyage, cargo handling capacity of the port, and many other factors. Nothing definite can therefore be said as to how much the freight can be cut down by chartering tramp liners.

(2) Profitability of Silo Management

If silos are to be operated on a commercial basis, maize should not be stored for a long period of time. Profit, from silo operation are determined by how frequently maize is loaded from the silos and how fast the empty silos are re-filled with maize for next loading. The higher the rate of silo operation (i.e., the rate of silo rotation), the larger the frofits. It is generally considered in Japan that if silos are to be operated on a commercial basis, they should be rotated nine times or more each year. This means that silos with a total storage capacity of 20 thousand tons must hadle 180 thousand tons of maize annually. The limited maize production in East Java makes this huge handling volume a remote possibility for the present, but it is considered that exports of cassava to the Netherlands, Belgium and West Germany from the province will increase the rotation rate of the silos. Cassava is processed into pellets for export at factories in Surabaja city and can therefore be stored in silos before loading on carriers. Further, there

is a time-lag between the export peaks of cassava and maize, as shown in Fig. 2. The rate of silo operation will be greatly improved by utilizing silos for storing and loading cassava pellets. This, however, is only an assumption based on numerical values and must be substantiated by studying the possibilities of exporting bulk cassava to the Netherlands and West Germany.

Fig. 2 - Monthly Exports of Maize and Cassava from Surabaja port



VIII. MANAGEMENT OF LOADING SILO SYSTEM

The problem of who should be responsible for the management of the loading silo system upon its completion is one that demands careful consideration because the proposed silo system must show a high rate of profitability. The profitability referred to here is determined, as explained in the preceding chapter, by the rate of silo operation, or, to be more precise, by the quantity of maize stored in the silos for export from Surabaja port.

The question then arises as to who possesses the entrepreneurial capability requred for the management of the loading silo system. There is no doubt that the silos will improve the cargo handling capacity of Surabaja port and contribute to the rationalization of the port's cargo handling service. On the other hand, however, the cargo handling companies can be expected to offer stiff competition since the silos would cut into their own business. Besides the cargo handling companies, warehousing companies in the city area would also suffer from the effects of silo construction. In fact, it is felt that warehousing companies would be affected more heavily than cargo handling companies.

Substantial administrative guidance will no doubt be required as a result of the silo system construction. Therefore, if maize is to be collected and stored in silos in as large quantities as possible, it is advisable that the silo system be jointly managed by the government and GPEI (Indonesian Exporters Association) which includes 232 exporters of East Java. Although this may give rise to some internal friction, the survey team considers this the only effective management system conceivable at present. It goes without saying, however, that at the actual stage of operation, the assistance of Japanese experts in operation techniques as well as advice and guidance on the management of the silo system should be sought.

IX. CONCLUSION

In order to study the possibility and economic feasibility of constructing loading silos in East Java, surveys and analyses were made from various angles described in the foregoing pages. The validity of the loading silo construction plan, as reviewed by the survey team on the basis of these surveys and analyses, can be summarized as follows.

It should be pointed out first that the construction of loading silos is physically impossible at the present stage, due to the fact that Surabaja port, which is the only seaport suited for maize export from East Java, heither has surplus loading capacity nor suitable land area for loading silo construction. Even if silos are constructed after demolishing the existing loading facilities, it would not be possible to secure an export volume large enough to insure stabilized silo operation under the existing structure of maize production.

There is no doubt, however, that if sufficient quantities of maize can be secured for export, the construction of silos will prove advantageous for maize export in many aspects. Whether the export volume of maize can be maintained on a sufficiently high level hinges on the future progrees of the accelerated agricultural production policy and improvements in the distribution mechanism and facilities for increasing the export volume of agricultural products. As things stand now, the survey team considers that a considerably long time will be required before the accelerated production policy yields its effects or the distribution system is brought to a satisfactory state by the structural and organizational improvement of agricultural cooperative societies. At present, the preparation of a master plan for Surabaja port improvement is progressing smoothly, and it will be possible to find a suitable construction site for loading silos in five to ten years.

The survey team is therefore of the opinion that studies and analyses of economic factors of the loading silo system should be conducted accrording to the progress of the Surabaja port expansion work at the stage when agricultural policies which anable increased production and ample export volume of maize are carried out. The validity of the silo construction plan should be measured against the findings of such studies and analyses.

APPENDIX SOME PROPOSALS ON AGRICULTURAL POLICIES FOR MAIZE EXPORT

As pointed out in this report, maize production in East Java has been carried out by traditional farming practices under the small-holder system primarily for domestic consumption and self consumption by the farmars. It is not an easy task to chart a new course of development against this background to turn maize into an international commercial crop and thereby attain increased agricultural income. It is true that there have been many instances where the small-holder system in developing countries succeeded in developing profitable export crops, but these were invariably backed up by a diversity of favorable conditions including adequate agricultural policies. In East Java, however, the production of maize, which is a forage crop and is therefore a low class crop, is planned to be augmented for export expansion in competition with the large-scale farming system of other maize producing countries in spite of the fact that limit has already been reached in the expansion of cultivated land while the production of food crops is not necessarily enough for self-sustenance. Conditions for accelerated maize production are therefore not at all favorable in East Java.

However, solution can be found for these adverse conditions by taking suitable measures for price problems. To be more precise, in the one hand, improvement in quality and decline in export price can lead to greater international competitive power and consequently export expansion of maize, while on the other hand, a rise in producer's price will result in an increase in production and farmers' income. The solution of these conflicting price problems is the key to expanding both exports and production. Since the international market price is a given condition that cannot be changed by the maize price in East Java, maize must be supplied to overseas markets at a sufficiently competitive price if exports are to be expanded.
It follows,therefore, that the reduction of producer's price and distribution cost is a prerequisite for expanded maize export. Some comments on four agricultural policies proposed for solving this price problem.are given in the following.

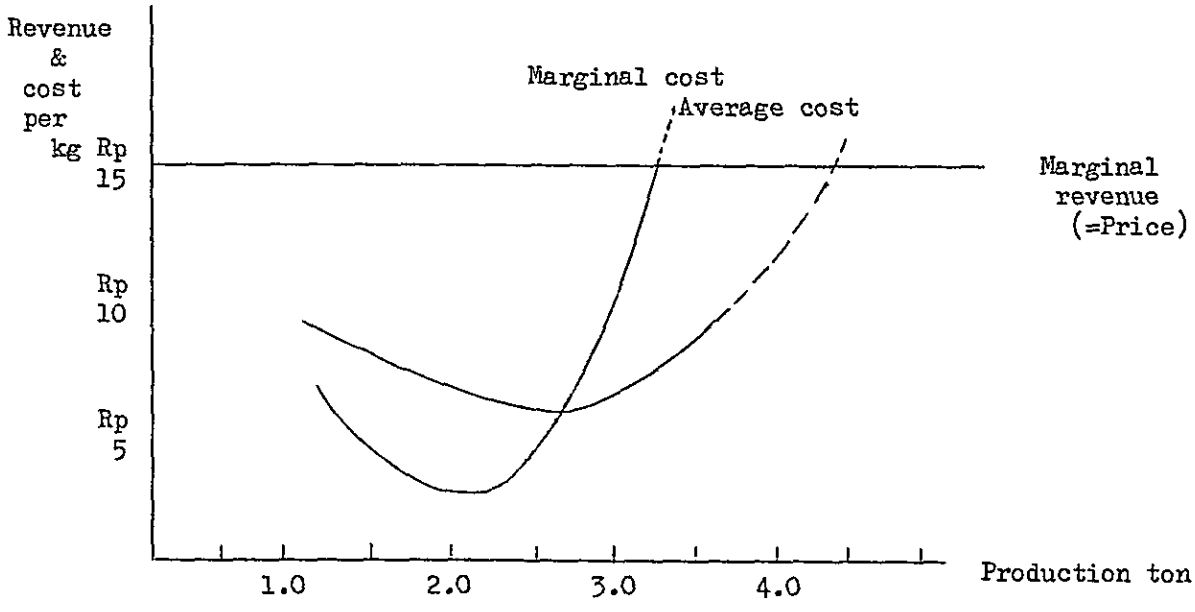
(1) Capital Goods Loan Policy

Under the Accelerated Maize Production Project, Bimas Djagung and Bimas Palawidja, which are being implemented in East Java, fertilizers, seeds and other agro-inputs are loaned out to farmers before the planting season to be paid after harvesting. This loan policy should be enforced as the most fundamental measure for increasing maize production for the reasons given below.

A study of the relationship between agro-inputs and production discloses that the value of marginal product derivable from additional input of fertilizers and improved seeds by far surpasses the marginal cost. Theoretically, the farmers' revenue (income in this case) is the largest when the marginal cost and marginal income (= price) are equivalent. Conversely speaking, room for price decline becomes large when such equilibrium is attained.
However, since the farmers actually lack the financial capacity for making agro-inputs, great significance should be attached to the loan policy.

The following table and chart were prepared from a model of the above relationship prepared by taking the changes in fertilizer input as the indicator.

Fertilizer		Labar		Land cost	Production		Farm Income	Average cost	Marginal cost
Quantity	cost	Hours	cost		Quantity	Value			
kg	Rp		Rp	Rp	kg	Rp	Rp	Rp	Rp
0	0	500	5,000	5,000	1,000	15,000	15,000	10.0	7.5
50	1,500	"	"	"	1,200	18,000	16,500	9.6	5.0
100	3,000	"	"	"	1,500	22,500	19,500	8.7	3.8
150	4,500	"	"	"	1,900	28,500	24,000	7.6	2.5
200	6,000	"	"	"	2,400	36,000	30,000	6.7	5.0
250	7,500	"	"	"	2,700	40,500	33,000	6.5	5.0
300	9,000	"	"	"	3,000	45,000	36,000	6.3	7.5
350	10,500	"	"	"	3,200	48,000	37,500	6.4	15.0
400	12,000	"	"	"	3,300	49,500	37,500	6.7	30.0
450	13,500	"	"	"	3,350	50,250	36,750	7.0	



Since the labor cost and land cost per hectare have practically relationship with the fertilizer input (additional labor required for fertilization is negligible

relative to the overall labor requirement), production increase derivable from fertilizer input can be considered in terms of the relationship between the said two factors. If maize is grown in an area of 1 ha on the assumption that the maize price is Rp 15 per kg. cost of fertilizer Rp 30 per kg, labor cost Rp 10 per hour, and land cost Rp 5,000 per ha, the farm income (labor cost and land cost to be borne by the cultivating farm household) increases with the additional input of fertilizer, but the yield rate declines as the production goes beyond a certain point. In this example, the farm income becomes the largest when 350 to 400 kg of fertilizer is applied. Production attained by this fertilizer input produces an equilibrium between marginal cost and price.

The above explanation is based on an assumptive model and does not imply that the said fertilizer input actually brings about the largest farm income. To determine the fertilizer quantity that produces the largest income, production cost must be studied for clarification of agro-inputs. It should be noted, however, that some data of production cost obtained in the maize project area show that the farm income calculated with the maize price set at Rp 15 per kg increased by 1.6 to 3.5 times by the input of 200 kg of urea and 25 kg of seeds of improved varieties, as compared with non-fertilized culture. Insofar as can be diduced from this calculation, the farm income will not drop below the present level and could even increase by 2.3 times over the present level even if the producer's price is cut down to Rp 10 per kg. Therefore, encouragement of fertilized agriculture is quite effective for improving farm income and fostering international competitive power of maize.

It was noted that farmers in the maize project area showed a rather reluctant attitude towards this policy in fear of the heavier burden of debt that might be imposed on them by poor harvest resulting from natural disasters or damages caused by insect pests and diseases. For far-reaching extension of this policy, therefore, special measures should be established so that farmers may be exempted from repayment in case of poor harvest. As for the advancement of living funds, it is advisable to establish a separate financing system to be operated independently of the capital goods loan policy. The planted area of maize in East Java exceeds 1 million ha. If funds are to be advanced to cover the entire planted area, the capital requirement will amount to a total of about Rp 6,000 million. Naturally, the application of the loan policy to the entire planted area in a short period a time is technically impracticable. However, the annual financial burden on the Treasury will be greatly alleviated by promoting turnover of recovered funds even though some of funds may not be recoverable).

(2) Re-examination of Export Duty

As described in this report, it is essential that the FOB price be maintained at about US$52.00 per ton if maize export are to be maintained at a constant level for supply, for example, to the Japanese market. At present, the producer's price averages about US$35.00 and distribution cost up to shipment about US$17.50, and the 5% discount rate system is in practice for quality assurance. These costs total about US$55.00 which is close to the FOB price that will ensure a constant export level. However, since this price is increased by more than 13% or roughly US$7.00 (10% for export duty, 2% for sales tax, 1% for stamp duty, and other expenses), East Java maize loses its international competitive power considerably and remains

a marginal export crop that can be supplied to overseas markets only when there is a rise in the international market price.

As in other developing countries, indirect taxes are larger sources of internal revenue than direct taxes in Indonesia. Therefore, foreign trade is regarded as a ready and easily available source of indirect taxes. Further, it can be accepted as being reasonable that the government applies different rates of export duties to processed and unprocessed goods for the purpose of increasing the added value of export products. However, rigid adherence to this fundamental principle does not necessarily result in an increase of internal revenue. Flexible application of the tax rates on a case-by-case basis will lead to increased internal revenue and eventually to the development of industries.

In the case under review, the 10% export duty equals US$5.00 to US$6.00. This means that the total tax revenue from exports of 100 thousand tons of maize amounts only to US$500 to US$600 thousand. Viwed from the standpoint of tax revenue alone, it is comparatively easy to find a souree of revenue elsewhere in place of the foregoing. Further, if the current rate of export duty is maintained, it will act as a minus factor in the national finance since the government expenditures for increased production and expanded exports of maize will inevitably amount to a huge sum.

Abolition or reduction of the current export duty or its rates is therefore a matter that deserves serious consideration. Due to lack of data, the survey team is unable to present an adequate indication respecting the relationship between the reduction of tax rates and the expansion of exports on the basis of calculations worked out in this report. It is hoped, however, that the rates of export duty will be applied flexibly without excessive concern for coordination between maize and other agricultural products. In the personal opinion of the auther of this appendix, it most advisable to abolish the export duty totally for the present, and resume it, if necessary, at later stage when the production and distribution system, have been improved to the extent that they promise constant and large quantities of maize export.

(3) Policy for Fostering Agricultural Cooperative Societies

Agricultural cooperative societies perform functions vital to the improvement of farmers' livelihood and agricultural development since they take an active role in the production and distribution of products, financing, and many other aspects. This is evidenced by the fact that agricultural cooperative societies are solidly organized in advanced countries.

Although GAKOPERTA, PSUKOPERTA and PRIMKOPERTA are organized into a system of agricultural cooperative associations in Indonesia, most exist in name only with very few exceptions. It is impossible to foster agricultural cooperative societies irrespective whether they are general or specialized in nature, unless they undertake a wide scope of activities in whole or in part, covering production, distribution and farmers' livelihood and not limited to the production and distribution of maize alone. In this sense, the fostering of agricultural cooperative societies may be considered as one of the fundamental agricultural policies.

In the expansion of production and exports, agricultural cooperative societies have two functions. In the first place, they provide the channel

through which capital goods are advanced and recovered; and, in the second place, they offer the distribution channel for the crops sold by farmers. Implementation of the capital goods loan policy should be accompanied by the activities of terminal organs and related technical extension activities. Agricultural cooperative societies are the only terminal organs that meet this requirement, and if they are to serve the purpose of the loan policy, they should be fostered by granting subsidies depending on the quantity of capital goods they have loaned out or the quantity of maize they have received in payment of loans.

Distribution of maize is almost entirely in the hands of private enterprises as stated earlier in this report. Although the distribution costs and margin collected by these enterprises are estimated to be not very large, there is still room for cutting down such costs and margin. If equipped with adequate distribution facilities and functions, agricultural cooperative societies will be able to meet the competition from these private enterprises since the facilities of the latter are still insufficient. For this purpose, it is necessary to grant subsidies and provide loans at low interest rates through the implementation of a policy for fostering agricultural cooperative societies. By the adoption of such promotional and subsidiary measures, the improvement of distribution facilities can be materiallzed through the activities of agricultural cooperative societies.

Agricultural cooperative societies are essentially organizations of farmers, and, therefore, they cannot be expected to grow and improve only by administrative guidance or promotional measures. Their development hinges basically on the efforts of the farmers themselves and on the organizing capability of regional leaders. Accordingly, a considerably long time will be required to foster and develop the agricultural cooperative societies.

In some districts of East Java, the inhabitants have a strong of awareness of strongly the value of cooperative societies and there are capable leaders. As a practical approach tc the development of agricultural cooperative societies, it is recommended that guidance and promotion activities be initiated in such districts so that the organization of these societies will be fostered and expanded by degrees and eventually cover the whole province. In order to attain the maximum results from the limited funds, subsidies should be granted on a priority basis.

(4) Price Support Policy

A price support policy for agricultural products is essentially a government policy for to purchase agricultural products at prices higher than competitive market prices in order to correct the income disparity between the agricultural and non-agricultural sectors or to increase or stabilize the supply of agricultural products so that their demand may be met by domestic production. Examples set by advanced countries indicate that this policy incurs a heavy financial burden on the government and does not provide a long-term solution for agricultural problems.

In Indonesia, accelerated maize production is not intended to make up for the shortage of domestic food production, nor does the income disparity between the agricultural and non-agricultural sectors present in itself a serious agricultural problem. This means that Indonesian agriculture essentially lacks the conditions that necessitate the formulation of the price support

policy. Further, application of this policy must be preceded by determining the price level based on a statistical analysis of sufficient basic data. This condition has not been met in the case of Indonesia.

The fact that a price support policy for maize is much discussed in Indonesia today is due to a desire to maintain the prices on a level that will stimulate production increase and thereby expand exports. In this case the price level that can serve as an incentive to augmented production is considerably high, and if maize sold at this high price level is exported, the government will have to bear a huge expenditure (several hundred million to several billion rupiah each year). Indonesia certainly has no need to increase its foreign exchange holdings by a small amount at the cost of defraging such a exorbitant seen. There is no doubt that the expenditures required for the foregoing three policies will prove to be far more effective than that needed for a price support policy. The validity of such a policy lies only in the fact that it support the price level by purchasing maize with government funds against sharp falls in the international market price and producer's price. Even in this case, the government will be forced to defray a huge expenditure from the Treasury unless there are facilities for storing purchased maize until the international market price improves. In actuality, however, there is little or no possibility that such a price support policy will become necessary.

At any rate, the price support policy will not be effective in present-day Indonesia, and its efficient execution is not considered possible due to the huge expenditures required. From the examples set by many countries of the world, the survey team wishes to point out that structural improvements rather than price manipulation or control is fundamental to an agricultural policy in Indonesia. Hence, agricultural policies should be drafted for the fostering of agricultural cooperative societies through which to attain, as described in Part (3) of this appendix, the improvement of distribution mechanism and technical extension system, as well as for a capital goods loan system which is described in Part (1) for implementation before the stage of structural improvement.

These policies do not differ from those already presented in Indonesia for expanding production and exports of maize. Agricultural problems demand a long time before they are brought to solution. It is to be noted that, with the exception of the export duty re-examination policy which can be expected to yield immediate effects, agricultural policies should be enforced in an integrated and systematic manner to attain the goals one by one. There is no short-cut to these goals.