A Comparative Study on Fertilizer Marketing Systems in Asia

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I. Introduction

In this paper I compare the fertilizer marketing systems of several Asian countries, and point out the general need to improve and expand the present fertilizer distribution systems in order to cope with the rapid increase in the volume of fertilizer being used in Asia.

There are some studies on detail methods of estimating fertilizer use in Asia where agricultural conditions affecting fertilizer consumption are changing rapidly. We should be able to predict the demand for fertilizer with reasonable accuracy at national and regional levels. The idea of demand is sound, but is a useful tool only when the system of distribution is well organized. It is less useful if farm are not supplied with the types of fertilizer they want, at the times they need them, in quantities they require, and at reasonable prices. Neglect of these aspects of distribution could lead to serious imbalance of supply and demand at the farm level. The performance of the system of distribution is thus an extremely important consideration in estimating demand for fertilizers. Yet it is a neglected area in

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many Asian countries. While farm produce markets receive a great deal of attention, input distribution does not.

In this paper I identify the existing marketing systems for fertilizer in order to compare their relative efficiencies, discuss possible alternative organizations under conditions of rising demand, and I put forward some ideas on the preparation of a program which could improve fertilizer distribution in Asia.

I have included six countries for purposes of comparison—Japan, Taiwan, Philippines, Thailand, Indonesia and Korea. These six countries account for nearly 80% of the total consumption of fertilizer in the region. Since the distribution system adopted by each country depends largely on socioeconomic conditions in each country it is a difficult task to compare the systems in a meaningful way. Further, there are severe limitations on available data dealing with the economics of input markets related to efficacy and efficiency problems. Therefore, it is very difficult to analyse the problems quantitatively and also to formulate a comprehensive study in each country. I emphasized only on what I see to be the main current problems, and to identify that they are serious problems which require serious research.

II. Trends on Consumption of Fertilizer

The consumption of fertilizer has been increasing rapidly in most Asian countries in recent years and it appears certain to continue to increase in the future at an ever accelerating rate. This is particularly so in food deficit countries like Korea, Indonesia, and the Philippines where governments give high priority to the achievement of food grain self-sufficiency through the use of fertilizer responsive varieties of rice and other grains.

In the six countries compared in Table 1 fertilizer consumption has been increasing continuously since the mid-1960's, and rose by 30% during the six years 1967-73. There have been marked differences between the six countries in the rates of increase. The group comprising Japan, Korea and Taiwan show an increase of only 16% from 1967-73(only 8.3% for Japan) while the group comprising Indonesia, Philippines and Thailand show an increase of 152.7% (212.8% for Indonesia), that is, an annual average of 35.5%. Table 1 also shows some difference in growth rates between the

Table 1. Total fertilizer consumption in six Asian countries

Country	1966-67	1969-70	1972-73	Change (1966-67=100)	
				1969-70	1972-73
	1,000 mt. of nutrients			%	
Japan	2,095.1	2,293.9	2,268.8	9.5	8.3
Korea	423.3	478.5	647.7	13.0	53.0
Taiwan	249.3	274.6	294.4	10.1	18.1
(Average)	(922.6)	(1,015.7)	(1,070.3)	(10.1)	(16.0)
Indonesia	142.0	271.1	444.2	90.9	212.8
Philippines	106.5	148.6	193.2	39.5	81.4
Thailand	67.0	99.3	159.9	48.2	138.7
(Average)	(105.2)	(173.0)	(265.8)	(64.4)	(152.7)
Total	(513.9)	(594.3)	(668.0)	(15.6)	(30.0)

Source: Chujiro Ozaki, "Production, Consumption and Price of Fertilizer in APO Member Countries," APO Meeting in Tokyo, 1974

earlier three years (1967-70) and the latter three years (1971-73). For the Japan-Korea-Taiwan group the more increase occurred during the earlier period than the later period, while for the Indonesia-Philippines-Thailand group it occurred during the latter period. It means that the consumption of fertilizer in the latter group is accelerating as the years pass.

Table 2 compares the consumption of fertilizer per hectare in the same

Table 2. Consumption of fertilizer per hectare in six countries

Country	1970-71~1972-73 Average			
	Total	N	P_2O_5	K_2O
	kg	%		
Japan	400.0	41.6	31.1	27.3
Korea	260.8	59.5	25.1	15.4
Taiwan	302.4	64.1	15.9	20.0
(Average)	(321.1)	(53.5)	(24.7)	(21.8)
Indonesia	16.7	82.6	13.2	4.2
Philippines	18.0	58.9	22.2	18.9
Thailand	10.6	45.3	33.0	21.7
(Average)	(15.1)	(64.5)	(21.4)	(14.1)
Total	168.1	(54.0)	(24.5)	(21.5)

Source: FAO *Production Yearbook*

six Asian countries (1970-71, 1972-73 average). The average for the six countries as a whole was 168.1 kg. of plant nutrients per hectare, but reverting again to the two groups, consumption in the Japan-Korea-Taiwan group was 21 times that of the Indonesia-Philippines-Thailand group (321 kg./ha.: 15.1kg./ha.). The extremes are seen in Japan (400.2kg./ha.) and Thailand (10.6kg./ha.).

If the countries of the second group are serious about increasing food grain yields, there is clearly plenty of room and great need to raise fertilizer consumption. Reasons for the low rates of application are probably to be found not only in the lack of understanding about fertilizers on the part of many farmers, and supply shortages, but also in high domestic prices and high-cost distribution. In short, fertilizer consumption in the Indonesia-Philippines-Thailand group is low both totally and per hectare at this point in time, but is rising rapidly and should continue to rise even more rapidly in the foreseeable future.

III. Types of Fertilizer Marketing Systems

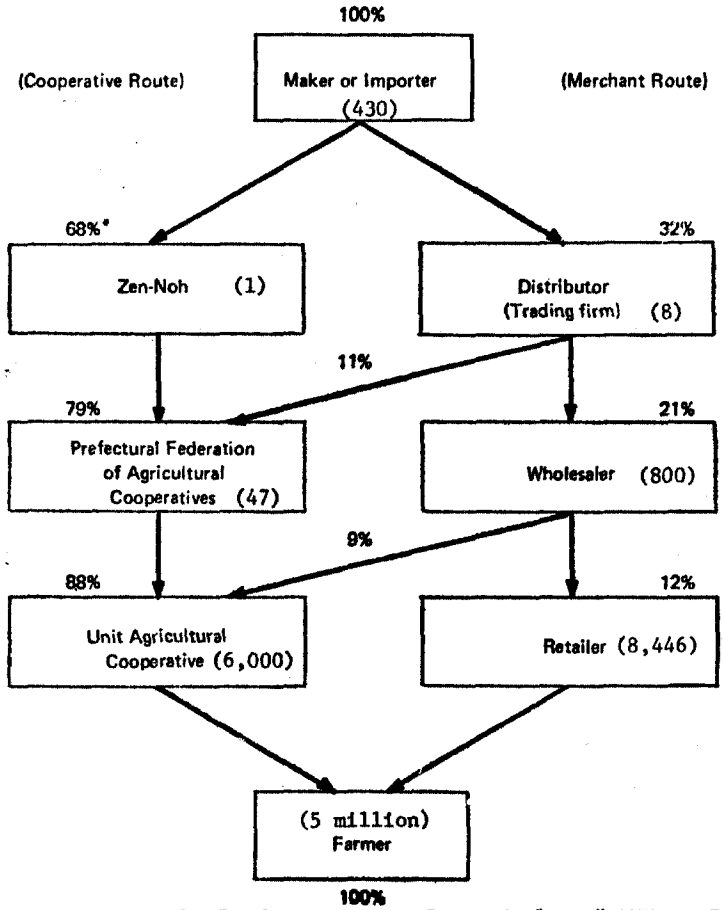
In many Asian countries chemical fertilizer is a relatively new input for most farmers and the distribution system, the market structure is not yet well developed. In this section I describe briefly the main characteristics of the fertilizer marketing systems in Japan, Korea, Taiwan, Philippines and Thailand.

1. Japan

There are two major fertilizer distribution channels in Japan: (1) Zen-Noh (Federation of National Agricultural Co-operatives) and (2) private dealers.

The national agricultural co-operative handled 68% of total demestic supply from the sources of manufacturing and imports in 1970-71. However, the proportion of fertilizer sold by unit co-ops to farmers was much higher, 88%, because the local prefectural and unit co-ops. distributed additional fertilizer that they purchased from private dealers. Accordingly, the percentage of the business volume by private dealers was 32% at the point of manufacturer's outlet, but only 12% at the retail market where farmers buy fertilizer directly from dealers.

Figure 1. Fertilizer distribution channels in Japan, 1972



Source: TVA, "The Fertilizer Marketing System in Japan," 1973, p. 7.

Each distribution channel is organized with 3 stages: National, Prefectural or regional, and farm level. The Zen-Noh and eight trading companies negotiate buying prices with the fertilizer makers, set prices at local level, and plan for fertilizer distribution.

The manufacturers ship fertilizer direct from the plants to the local rail way stations nearest the unit cooperatives under the shipping instructions of the national co-op. The quantity of fertilizer distributed is based upon advance orders by farmers. The national cooperative sums up all of farmers' orders by type four times a year. In price negotiations with manufacturer, Zen-Noh has the advantage of being a very big buyer, and it also is able to take the initiative in stabilizing the fertilizer market.

Shipping fertilizer direct from the manufacturing plants to unit co-ops has considerably reduced marketing costs and delivery time. Furthermore, the co-op commission charge for fertilizer handling at three levels totals slightly less than 12%. As a result, farmers are able to buy fertilizer at relatively low prices.

Upon delivery of the fertilizer to farmers, payment is made to the unit cooperatives mostly in cash. Accordingly, about 6,000 unit cooperatives have played the leading role in fertilizer distribution by providing fertilizer to farmers and collecting money from farmers. The prefectural co-ops function as the intermediate agent for transferring farmers' fertilizer orders and collecting bills from unit cooperatives for the Zen-Noh.

Private dealers, including 800 wholesalers and 8,500 registered retailers, are less important in fertilizer marketing in terms of business volume than the co-ops and they are strongly influenced by the co-ops as competitors in the same business line. Private dealers compete by providing good farmer services, including holding stocks of various types of fertilizer so that farmers can buy their requirements when they need them.

2. Korea

The fertilizer marketing system in Korea is organized mainly to distribute domestic production. The proportion of finished fertilizer that is imported is negligible.

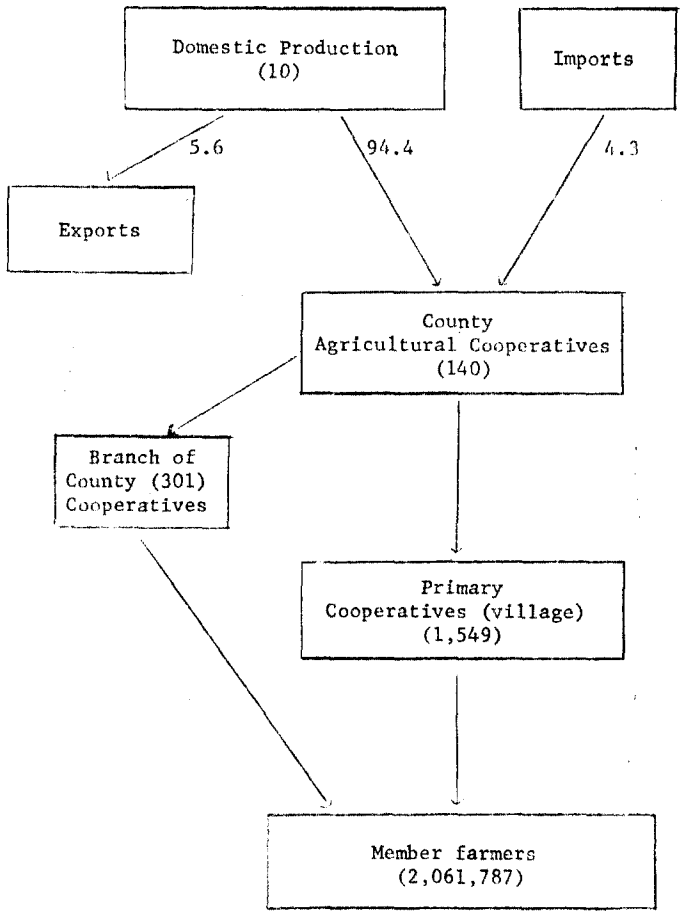
The fertilizer market in Korea is controlled completely by the government through the allocation of production quotas, price setting at all levels, and the rationing of fertilizer.

According to the government fertilizer policy, the National Agricultural Cooperative Federation is charged with full responsibility for distribution at both wholesale and retail functional levels. Thus, the fertilizer producers are not involved or concerned with marketing their products.

Agricultural cooperatives are organized vertically at three levels for multipurpose agricultural business. At the national level, one NACF; at regional level, 140 county cooperatives; and 1,549 primary cooperatives are stationed at the township level each serving around 20 villages or 200-300 farmers.

For the fertilizer distribution, NACF sends the shipping orders to each manufacturer and the shipping company. In accordance with this, the fertilizer is usually shipped by rail to the county cooperatives for distribution

Figure 2. Fertilizer distribution channels in Korea, 1973



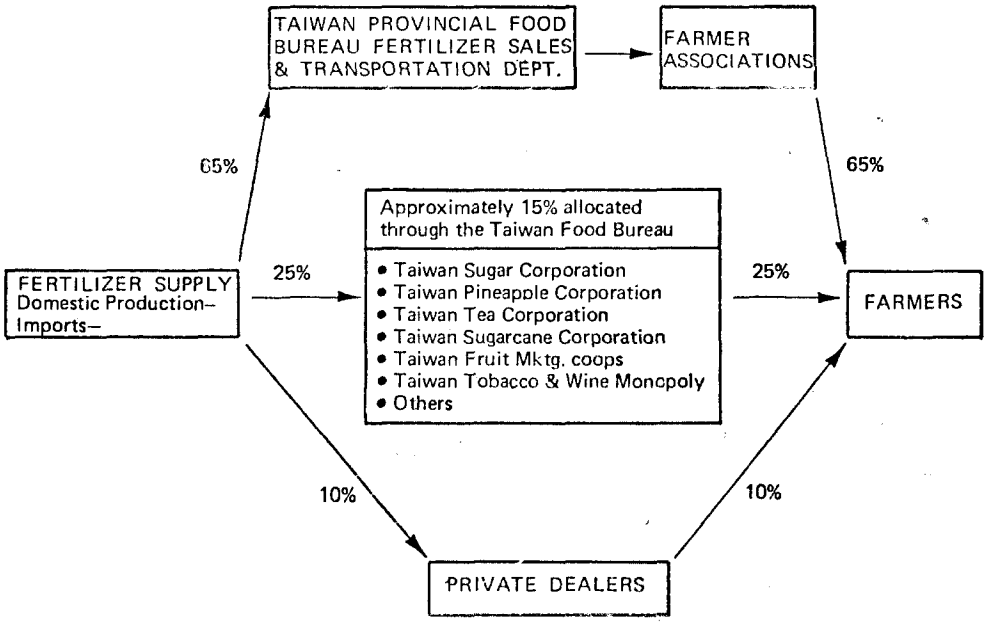
Source: TVA, "The Fertilizer Marketing System in Korea," 1975, p. 10.

to farm areas by the express company.

The county co-operatives take delivery at nearby railway stations and either truck the fertilizer directly to their warehouses and branches in rural towns, or have this service partly done by the express company on a contract basis. The farmers receive their supplies from primary co-op. or the branch of county co-op., and are responsible for transporting their fertilizer to their farms. The primary cooperatives do not maintain stock on hand, but dispose of their rations of fertilizer from county or its branch co-ops soon after collecting each payment.

As the demand for fertilizer has risen faster than available supply recen-

Figure 3. Fertilizer distribution channels in Taiwan



Source: TVA, "The Fertilizer Marketing System in Taiwan," 1973, p. 8.

tly, a rationing system has replaced one in which advanced orders from farmers were sought. Rationing is based on crops grown, area of cropping, quantity and type of fertilizer available and so on.

3. Taiwan

Fertilizer distribution in Taiwan is primarily the responsibility of the government. Fertilizer sales are made through three channels: 1) the Food Bureau of the government, 2) corporation of special crops, and 3) private dealers.

1) The distribution channel of the Food Bureau-farmer association is most important in view of the quantity distributed. It accounted for 65% of the total fertilizer sold in 1970. The Food Bureau functions as the wholesaler, while the farmer associations through their multipurpose agricultural cooperatives perform retail functions. Fertilizer sales through this channel was transacted by a fertilizer-rice barter system for many years until it was abolished in 1973.

2) A second important channel of distribution is through various kinds of corporation channels such as sugar, pineapple, tea. About 25% of all Tai-

wan fertilizer sold was distributed through these channels to their member growers. For example, the Taiwan Sugar Corporation allocates fertilizer to growers through 27 sugar factories.

3) The third distribution channel is that of private dealers who do this business under tight control of the government. The volume handled by dealers accounted for only 10% of total fertilizer sales in 1971.

4. The Philippines

One report estimates the proportion of imported fertilizer to total consumption at 70% for 1974 and this share is expected to increase in the foreseeable future. The fertilizer, including both domestic and imported products, is distributed through the fertilizer companies and the Sugar Planters Cooperative Marketing Association.

SPCMA was the most active and moves the largest tonnage of fertilizer throught its affiliated associations. It accounted for over 60% of total supply for years, but by 1974 its business had fallen to only 40% mainly because rice farmers applied more fertilizers than before.

About 60% of the present total supply of fertilizer are distributed through three channels: 1) importers appoint regional wholesalers and distributors who either sell directly to farmers or sell to their assigned dealers who in turn sell either directly to farmers or through appointed subdealers, 2) importers sell fertilizer to farmers through appointed dealers, and 3) importers sell the fertilizer directly to large size of corporate farms.

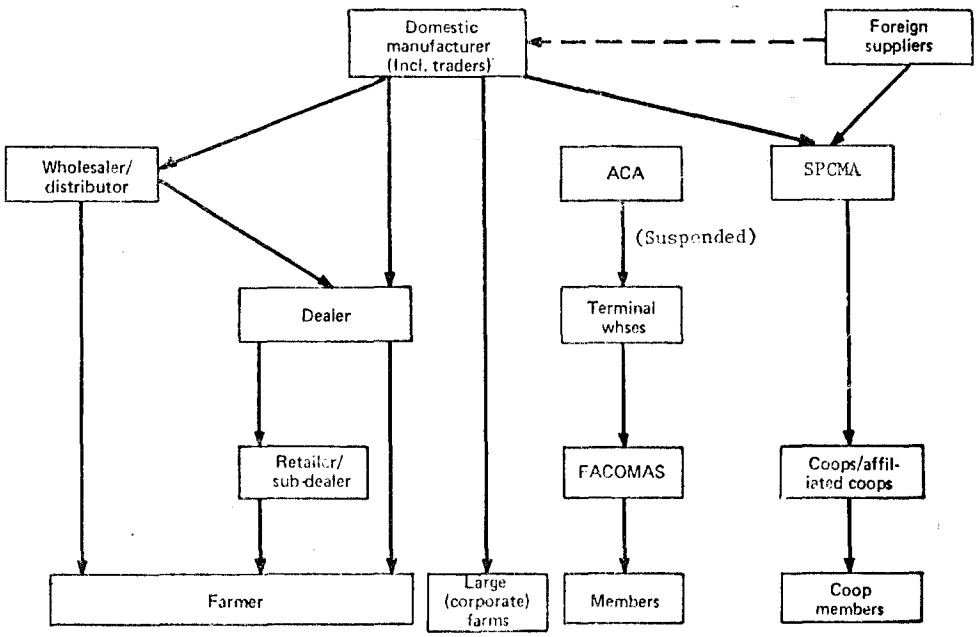
The ACA was another important fertilizer distribution channel through which FACOMAS operated as a type of agricultural cooperative until 1964. ACA distributed fertilizer to rice and corn farmers at a 50% subsidised until 1964 when the subsidy was terminated. It continued in the fertilizer distribution business on a cash or on credit basis until 1971 when it was finally abolished.

The fertilizer distribution system for the general farmers is based on private dealers at three different stages without a strong price control or a subsidy policy. As there are over 7,100 islands in the Philippines, about 70 % of all fertilizer are distributed by barge.

5. Thailand

About 89.2% of the total consumption of fertilizers in Thailand during

Figure 4. Fertilizer distribution channel in the Philippines



Source: TVA, "The Fertilizer Industry in the Philippines," 1971, p. 36 and Chujiro Ozaki, paper presented at APO Meeting in Tokyo, 1974.

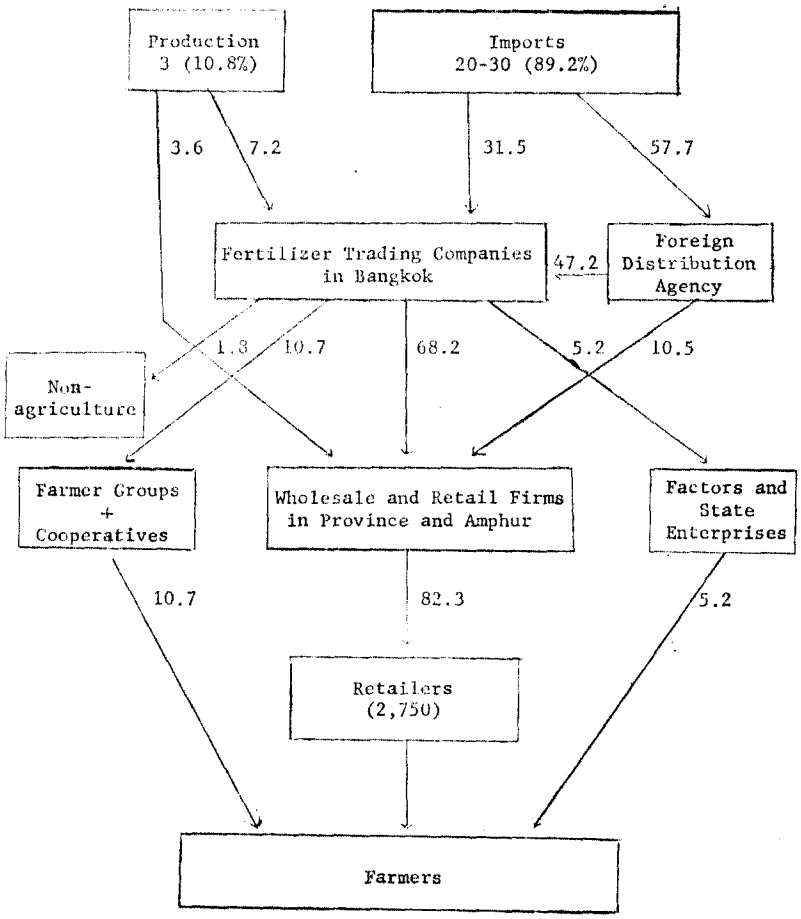
the period 1967 to 1973 were imported and the contribution of domestic fertilizer is small (only 10.8%).

Most of the fertilizer is channeled through numerous private small and large distributors. The fertilizer importing business is handled mainly through representatives of foreign companies and domestic trading companies in Bangkok. There are responsible for pricing and the distribution.

Fertilizer trading companies import fertilizer directly from abroad and through the representatives of foreign agencies in Bangkok, and also procure part of the domestic production. They sell 85.9% of the total fertilizer supply in Bangkok to local wholesale and retail firms, farmer cooperatives, factors and state enterprises and a small portion for nonagricultural use. The dealers and other institutions, in turn, supply the farmers.

The representatives of foreign companies import 57.7% of the total supply. They sell 47.2% to the Thai trading companies in Bangkok and the balance, 10.5% to wholesale and retail firms at the local province and Amphur levels. The wholesalers and retailers sell their fertilizer to 2,750

Figure 5. Fertilizer distribution channels in Thailand, 1968-73



retailers in rural areas who, in turn, supply the farmers. Although it impossible to formulate a kind of competitive price situation, the dealers often agree on a uniform price level by type of fertilizer rather than compete with each other. Collusion on price is made possible by limited availability of certain types of fertilizer.

There are numerous allegations of fertilizer marketing problems, particularly the many levels of intermediate dealers between importers and farmers. The fertilizer prices paid by farmers are quite high as compared with other Asian countries.

IV. Comparison of Marketing Systems

The fertilizer systems described in Section III differ in their organizational

structure, and in the role and function of government related institutions and private dealers. The comparison is limited by the availability of data but some of the major advantages and disadvantages of the various systems can be identified.

There are three main organizational types:

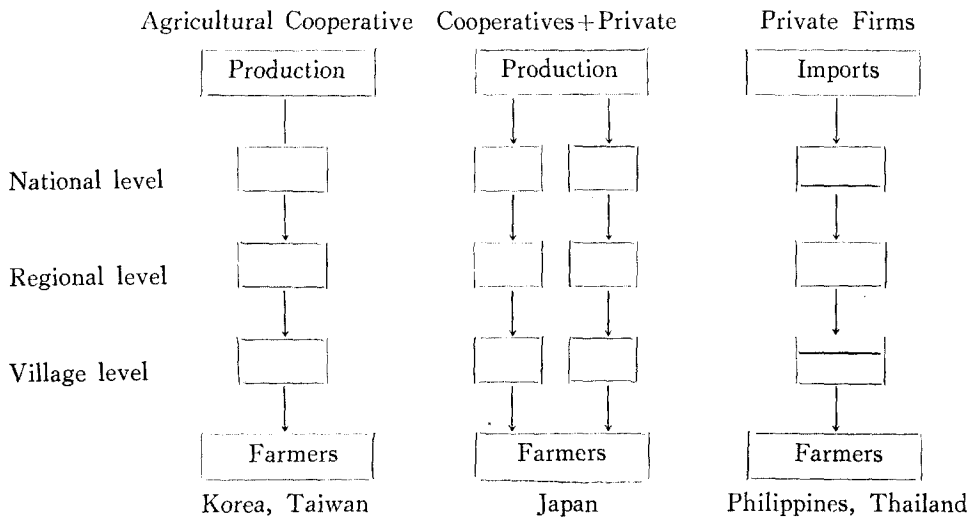
1) Where the co-operiatives take a dominate role in fertilizer distribution (Korea and Taiwan);

2) Where the fertilizer business is undertaken predominantly by prvate dealers (Philippines and Thailand); and

3) Where cooperatives and private dealers share and compete (Japan).

Each country has its own reasons for developing and maintaining the distribution system it has adopted, and the regulation and control of the systems vary accordingly. If we assume that increases in agricultural productivity per hectare and per man can be attained through greater use of fertilizer, each country should evaluate carefully its own distribution system, be aware of alternatives, and be interested in building the most efficient marketing system for fertilizers that is possible.

Figure 6. Types of fertilizer flow



In the first type, government makes all important policies on fertilizer and monoplizes the distribution system through a centralized agricultural co-operatives organization. This tight control of all aspects of the fertilizer business allows the Korea and Taiwan governments to implement directly their

national agricultural plans. It appears that this system supplies fertilizers to farmers at somewhat lower prices than in the countries using private dealers, at least when and where the cooperatives work systematically. On the other hand this system does not appear to provide other fertilizer related services to farmers as well do private dealers. When there are conditions of tight supplies of fertilizers and excess demands at the prevailing prices the distributors can sell all the fertilizers they can get without providing special services, and, of course, they have not met any challenge of competition from any other source.

In the second type where private dealers predominate, the fertilizer marketing system is entirely different. Since there are usually numerous dealers it might be expected that competition would result in low prices to the farmer. However, this does not appear to be the case; prices are often not formulated through competition but through price agreements amongst large traders at the national level. Again quantities are limited in any year and there are few original suppliers(importers and manufacturers). Fertilizer prices in the Philippines and Thailand are rather higher than in other Asian countries. Price fixing by importer or large traders may be one reason for this, but it also could be high trading margins through the system and a proliferation of marketing levels between original suppliers and farmers.

The third type allows both systems to operate and compete. In Japan private dealers handle 12% of all fertilizer at the retail level, provide the farmer customer with good services and compete effectively with the cooperative. This competition has induced the cooperatives to improve their farmer services and might stimulate efficiency. The central cooperative, handling some 68% of the wholesale volume, plays the price making role in the domestic market. This dual-competing system seems to work well and may be the answer to the main probems encountered by the cooperatives only and private dealers only systems without removing the advantages each of these has over the other. Since most Asian countries need to develop an efficient marketing system, such competition could be an appropriate path toward this goal.

A comparison of the price levels among Asian countries between two time periods was quoted here as a reference (Table 3). The prices of nitrogen element in the middle of 1974 was lowest in Korea and highest in

Thailand. The price in Thailand was nearly three times that in Korea and more than 2.5 times that in Japan and and Taiwan.

It is intersting to note the price change between two time periods: fertilizer prices in low level fertilization countries like the Philippines and Thailand increased more than in high fertilization countries like Taiwan and Japan. have The main reasons for this are probably the source of fertilizer, particularly the proportion of imported fertilizer to the total consumption. In general, the prices in the countries which are heavily dependent on imported fertilizer are higher and are probably more affected by the world market price and transportation costs of ocean barges. The second reason results clearly from the high distribution costs and margins. Since prices are affected by the degree of subsidy, available credit, transportation charge, storage cost, rate of tax and capital interest, these factors are compared among countries in Table 4.

The countries where the prices of fertilizer are high are characterized by small or no subsidy, no available institutional credit, and high distribution costs. Distribution costs are broken down in detail and compared between two countries, Korea and Thailand in Appendix Tables 1 and 2. In short, the level of fertilizer use is related to the fact-product price ratio. The reduction of distribution costs with suitable service should be taken into account continuously in policy formulation so that the farmer can obtain the benefits from more production. In view of this, efficient marketing is one of the important concerns. However, if the distribution costs allowed by the government are too strictly fixed within a limited range on the basis of the present distribution cost (as in Korea), the cooperatives are unable to accumulate the capital required for improving marketing facilities, and for coping with the rapid expansion of the fertilizer business.

However, there is no guarantee that the Japanese system would work as efficiently elsewhere. Marketing efficiency is not only a matter of structure and organization—managerial ability plays an important part. It may be easy to import and adopt well-organized and efficient system, but it is difficult to obtain the same results. Greater efficiency may come with experience and time. Perhaps the first thing is to set upon acceptable system, one that is potentially the most efficient, and then set about achieving the efficiency it promises.

Table 3. Fertiilzer retail prices 1972 and 1974 in some selected Asian countries

(US $1 mt. of plant nutrient)

Country	1972			1974 (mid of the year)		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Taiwan	211	623	125	338	378	187
Japan	215	250	111	306	545	190
Korea	149	105	47	291	207	152
Philippines[a]	313	326	164	464	n.a.	n.a.
Philippines[b]	—	—	—	820	678	230
Thailand	495	382	165	877	685	295

N as urea, P_2O_5 as *TSP* or single super, K_2O as muriate of potash
Philippines *a*=Food crop; *b*=export crops
Thailand=Bangkok retail prices

Source: H. R. von Uexkull, "External Trade Problems for Fertilizer and Food Grain," presented at the APO Meeting in Tokyo 1974.

Even where the present marketing system operates efficently it still may need to be changied over time as conditions change. The fertilizer situation is changing rapdly in Asia and the distribution system should change and adjust to meet each new situation—changes in fertilizer types, location of new plants, expanding product from existing plants, and exploitation of mineral resources will all have an impact on the present marketing system and pattern. Important changes are taking place also in the consumption of fertilizer—changing cropping patterns, area cultivated, prices of agricultural output and inputs(including fertilizers). An unchanging marketing system may not remain efficient or adequate for long.

An important measure of marketing efficiency is the prices paid for fertilizer by farmers (Table 3). However, many factors influence this which

Table 4. Comparison of conditions for fertilizer marketing

Country	Subsidy	Credit*	Mode of transportation % of ton-km.			Size of bag	Price fixing	Estimated costs of distribution
			Truck	Rail	Water			
Japan	None	23%	8	57	35	20	Co-op	15
Korea	37%	16	4	92	4	25	G	12
Taiwan	None	60(barter)	90	90	10	40	G	16
Philippines	Part	None	—	—	70	50	Private	
Thailand	None	39	69	24	7	45+50	Private	22

* Institutional credit only

may not be related to marketing efficiency-level of import duties, subsidies, availability and cost of institutional credit are a few examples from the government side. The lowest fertilizer prices amonget the countries studied are found in Korea, but this is due largely to a heavy subsidy (37.2% of total costs including prices paid to manufacturers and costs of distribution in 1974). In contrast, the higher prices paid by farmers in the Philippines and Thailand reflect an absence of subsidies.

V. Conclusion

The need for improvements in the fertilizer marketing systems of Asia becomes more urgent with each year that passes. Many Asian countries are unable at present to supply all their food grain requirements and are in urgent need of greatly increased agricultural productivity. Greater use of fertilizer is one important means to this end. It is asserted that the low levels of fertilizer use is a result of a fertilizer shortage, rather than the distribution system and price structure. However, where the farm gate price of fertilizer is high relative to grain prices and where credit at low rates is difficult to obtain it is only reasonable to expect farmers to use fertilizer extremely sparingly or not at all. I mainain that the real problem is high prices rather than supply shorttage, and this problem is partly one of inefficiencies in the marketing systems. It is here that greater attention is urgently needed and where action can yield positive results,

Amongst the various fertilizer marketing systems examined I recommend that of Japan as a suitable alternative for the other countries in Asia. It is based on both agricultural cooperatives *and* private dealers; it has both cooperative influence on prices *and* competition.

But reorganization alone may not improve efficiency and reduce costs and prices. Management and other factors may limit, initially, the potential gains of reorganization. The reorganization suggested is a first step towards a more efficient fertilizer marketing system which can relate closely to changes in demand and supply of fertilizers—changes that will take place at an increasing tempo in the years ahead.

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