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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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and on Sub-Regional/Regional Co-operation in
the Pesticides Industries

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A 1975 REAPPRAISAL OF THE COSTS FOR PESTICIDE INPUTS IN THREE FAR EAST COUNTRIES, INDONESIA, THE PHILIPPINES AND THAILAND, AS COMPARED TO DATA PRESENTED IN THE UNIDO/FAO PESTICIDE SURVEY (IS/RAS/71/84) PREPARED IN 1973 1/

by

W. J. Magee
UNIDO Consultant

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Severe drought reduced total agricultural production by most of the member countries of the Economic and Social Commission for Asia and the Pacific (ESCAP) during 1972. It was the first time in 7 years that the developing countries of Asia and the Pacific failed to show an increase in total agricultural production. Milled rice production, a staple in the area's diet, declined 8 percent from 1971 to total 103 million tons in 1972. Meanwhile demand for rice imports by Indonesia, the Philippines and Bangladesh was strong while exportable supplies diminished in Thailand, Pakistan, Burma and Japan. By early 1973, Asian rice prices were about 50 percent higher than they were a year earlier. (1).

Although per capita milled rice production in the Far East declined from high of 106 kilograms in 1964 to 92 kilograms during the severe drought year 1966, the Green Revolution had helped raise it back to 105 kilograms by 1970. When per capita production declined sharply to only 89 kilograms, its lowest level in the last 10 years, in 1972, the region had 200 million more people to feed than in 1964. Increased wheat consumption met part of the short fall in rice supplies and had been made possible by dramatic success with high-yielding varieties which had enabled the developing countries of Asia to almost double their per capita wheat production between 1964 and 1972.

Programmes utilizing high yielding wheat and rice varieties require the extensive use of fertilizers and pesticides. The pesticide component for these programmes can usually be covered by from 6 to 36

(depending on status of pest resistance) of the more than 250 pesticides being sold for plant protection or vector control. These pesticide demands,however, usually must be supplied from distant plant locations and constitute a serious drain on limited foreign exchange reserves of most developing countries. In recognition of the importance of developing the local pesticide industry and the establishment of regional or sub-regional cooperation in this field, ESCAP requested the United Nations Industrial Development Organization to conduct a pre-feasibility survey on the demand and production of pesticides in several countries of the ESCAP region. This survey which took place in 1973 coincided with the period, already mentioned, when Asia's rice shortage had reached a critical level. By coincidence the survey also was conducted when a number of factors were combining to make pesticides not only more expensive but in short supply. The reports of the Pesticide Survey (2,3,4,5,6,7,8 and 9) made a number of recommendations which will be considered by this Regional Symposium for Asia and the Pacific on the Production and Promotion of Pesticides and on Sub-regional/ Regional Co-operation in the Pesticide Industries. It therefore seems appropriate to examine the estimated pesticide requirements for 1974 of three of the countries that were covered in depth by the 1973 Survey and adjust these data to reflect the impact that the general short supply of chemicals, including pesticides, which developed in 1973 and was further complicated by the petroleum embargo of October 1973 and subsequent price increases by the petroleum producers had on them. The countries selected as case studies for this presentation are Indonesia, the Philippines and Thailand and each of these nations has played a significant role in Asia's rice market.

INDONESIA

INDONESIA has for some years been a rice importer, and her rice production showed little progress until the late 1960's. High yielding varieties combined with a series of BIMAS (mass guidance) programmes

had gradually raised production, the record 12.7 million tons level produced in 1971. In 1972 drought reduced total production to 12.2 million tons and the Government was forced to purchase large quantities of rice overseas in an unsuccessful effort to stabilize prices in the urban centers.

No pesticide imports for the BIMAS pigests were made from the 1970 dry season until the 1973-74 wet season because of excessive carry over from the previous, (1968-1970 dry season), programmes. To reduce these old stocks an undisclosed amount of material which had not spoiled was offered for sale at half price in 1973, while losses due to spoilage were estimated to be in the order of 500,000 liters. The cost price of the spoiled material alone, which approximates $US 1,863,750 CIF was at the time of purchase sufficient to cover the equipment component of at least 5 and perhaps 6 minimum economic capacity pesticide formulation units. This constitutes a serious loss in foreign exchange which could have been avoided, at least partially, had local production facilities been available to prepare these products as needed.

An indication of the effect of rising pesticide costs due to the pesticide shortage of 1973-74 and the effects of the Petroleum embargo with subsequent price increases on the UNIDO/FAO Pesticide Survey's estimates of Indonesia's pesticide requirements is given in Table 1.

TABLE: 1. ESTIMATED PESTICIDE REQUIREMENTS BY INDONESIA for 1974 comparing costs at 1972-73 prices with 1974 cost levels.

	Quantity Active ingredient (MT)	1972-73 CIF value ($US)	1974 CIF value ($US)
INSECTICIDES [1]	4425	5,878,825	7,705,423
with malaria eradication	13583	14,762,376	20,448,056
FUNGICIDES	522	1,115,959	1,495,385
HERBICIDES	2975	5,570,969	6,685,163
OTHER	351	660,227	818,681
TOTAL	8273	13,225,980	16,704,652
with malaria eradication	17431	22,169,531	29,447,285

1/ Includes Operational Malaria Control Programmes.

The cost to Indonesia for maintaining its current level of pesticide consumption at 1974 prices was about 26 percent more than estimated at the time of the Survey. For essential Malaria control programmes the cost of maintenance is even higher because the price of imported 75 percent DDT water dispersible powders has risen some 44 percent over their 1973 level. The increase cost in 1974 over September 1973 to go from an operational malaria control programme to one of eradication is estimated for the first year of operation to be in the order of $US 4.4 million which alone affords considerable justification for the serious consideration of the erection of DDT manufacturing facilities to serve local Indonesia needs and those of a sub-regional nature.

In the food grain production sector, the combination of higher costs for rice imports (in 1973 some 50 percent more than in 1972) and higher cost for imported pesticide inputs (about 26 percent higher in 1974 than 1972-73) would also indicate that local manufacture by Indonesia of a limited range of "commodity" pesticides such as 2,4-D, MCPA, malathion, diazinon and dimethoate is not merely desirable but essential to further agricultural development and may perhaps even be essential to maintain a state of <u>status quo</u> in agricultural productivity.

THE PHILIPPINES

Except for small amounts of seed for planting or breeding the Philippines did not report rice imports for several years prior to 1971. In that year, however, losses from typhoons with rising market prices led to large cash purchases for 437,000 tons of rice which increased to some 482,000 tons in 1972. A further increase in rice imports was expected in 1973. These purchases by a country previously considered to be self sufficient in rice not only contributed greatly to a change in Asia's rice outlook but prompted the Government to implement for

the 1973-74 crop year a series of integrated, coordinated programmes combining credit, technology and supervision in order to regain self-sufficiency in food grains. These were the MASAGANA Programmes on rice, maize, sorghum, soya beans and tobacco and the PALAYAN NG BAYAN Programmes to put unused land into cultivation of a variety of food crops.

The first of these programmes, MASAGANA 99, on rice was almost 100 percent implemented with the result that most chemical inputs were temporarily short because the industry, based on past experience, had only stocked for about 40 percent implementation of the project. MASAGANA 99 covered 800,000 hectares or approximately one-fourth of the normal harvested rice acerage and it was apparent by mid-1973 that it alone would double the nations pesticide requirements over the previous year. According to participating economists, a 70 percent return of loans funding the programme would be sufficient to maintain it on a continuing and viable basis as well as permit its enlargement into uncovered areas. Consequently Philippines pesticide requirements for 1974 were expected to be almost twice those of 1973.

Table 2 illustrates the effect of rising pesticide costs due to the chemical shortage of 1973-74 and the effects of the petroleum embargo with subsequent price increases on the UNIDO/FAO Pesticide Survey's estimates of Philippines pesticide requirements.

TABLE 2. ESTIMATED PESTICIDE REQUIREMENTS BY THE PHILIPPINES for 1974 Comparing Costs at 1972-73 prices with 1974 cost levels

	Quantity Active ingredient (MT)	1972-73 CIF value ($US)	1974 CIF value ($US)
INSECTICIDES	4435	15,239,882	19,412,432
FUNGICIDES	605	3,325,030	4,455,540
HERBICIDES	1742	6,150,000	7,380,000
OTHER	269	650,000	806,000
TOTAL	7550	25,364,912	32,053,972

As was the case with Indonesia, the cost to the Philippines for pesticide inputs to fuel its on-going programmes to regain self-sufficiency in food grains is about 25 percent higher in 1974 than it was in 1972. The nation has not yet uncovered petroleum resources to provide as broad a base for chemical industrial development as would be desired but its present level of exploitation of certain mineral resources with modest expansion would permit captive production of the main chemical inputs necessary to feed its agricultural development programmes. Local production of BHC, 2 4-D and/or MCPA would satisfy 80 percent if not more of the MASAGANA 99 rice programmes requirements. Here again the high cost of rice imports until self-sufficiency is regained and the higher cost of imported pesticide inputs make local pesticide manufacturing investment even more attractive than it appeared to be in 1973 at the time of the Survey.

THAILAND

Traditionally Thailand has been a rice exporter, however, a long drought early in the 1972 growing season followed by heavy rains and flooding adversely effected several crops including rice. The 1972 rice crop was estimated at about 13 percent below the 1971 level with the result that stocks available for export declined from some 2 million tons in January 1-72 to an estimated 750,000 tons in March 1973. The rice area of Thailand is approaching its limits but multiple cropping is expanding . High yielding varieties have rarely been planted because their quality would not meet Thai export standards. Thailand has not had programmes on food grains that combine credit, technology and supervision and its fertilizer policy was such that the Thai farmer paid the highest price in Asia for this essential input. Since Thailand's rice cropping area is approaching its limit the need to support multiple cropping with coordinated, integrated programmes combining credit, technology and supervision combined with a realistic fertilizer policy and adequate guaranteed floor price is obviously necessary to allow Thailand to feed its ever expanding population and maintain its traditional role as a rice exporter.

The effect of rising pesticide costs due to the chemical shortage of 1973-74 and the effects of the petroleum embargo with subsequent price increases on the UNIDO/FAO pesticide survey's estimates of Thailand's pesticide requirements is indicated in Table 3. Prior to 1973 Thai cotton had become an expanding crop and a high volume user of pesticides, mostly insecticides. A combination of poor yields and low market prices plus high pesticide input cost had drastically reduced the acreage in 1973 but unexpectedly low pesticide input requirements that year, high market prices and excellent yields on the small acreage planted indicated that the area under cotton in 1974 would increase to its previous levels. Consequently estimates in Table 3 include data with and without an expanded cotton pesticide market.

TABLE 3. ESTIMATED PESTICIDE REQUIREMENTS BY THAILAND for 1974 comparing costs at 1972-73. Prices with 1974 cost levels.

	Quantity Active ingredient (MT)	1972-73 CIF value ($US)	1974 CIF value ($US)
INSECTICIDES 1/	6,171	11,634,962	15,015,507
expanded cotton 1/	10,787	21,634,962	27,791,707
expanded cotton + malaria eradication	13,441	24,209,051	31,498,395
FUNGICIDES	2,634	2,509,494	3,362,722
HERBICIDES	1,427	2,363,274	2,835,929
OTHER 1/	394	558,649	692,735
TOTAL 1/	10,626	17,066,379	21,843,883
expanded cotton 1/	15,242	27,066,379	34,683,083
expanded cotton + Malaria eradication	17,896	29,640,468	38,389,771

1/ Includes operational malaria control programmes requirements.

The cost of Thailand for pesticide inputs in 1974 is estimated to have been about 28 percent lighter than those estimated by the 1973 survey. Should Thailand implement a malaria eradication programme the cost increase between 1972 and 1974 for this alone would amount to almost $US 8,75 million for the required imported 75 percent water dispersible powders for only the first year of operation.

It should be emphasized that throughout the foregoing discussion, the term "pesticide requirements" as it applies to Indonesia, the Philippines and Thailand is based on usage as a result of natural forces in the market and/or governmental promotional programmes which influence the rate of growth of the pesticide market. These requirements are therefore practical rather those required theoretically for optimum pesticide coverage. Within this frame of reference, which is somewhat restrictive, the increased cost of pesticides to Indonesia, the Philippines and Thailand for their anticipated 1974 requirements over 1972-73 levels amounts to almost $US 17.8 million as a result of short supplies in the chemical industry and the petroleum embargo with subsequent raw material price increases. On average, these countries had to pay 27 percent more per kilogram of pesticide active ingredient in 1974 than in previous years in which pesticide price levels had remained relatively stable. In retrospect, a prior investment, equal to this $US 17.8 million cost increase for pesticide inputs, in local basic manufacturing facilities for subregional supply of a few commodity pesticides would have been extremely beneficial. The attractiveness of local manufacture within a sub-region consisting of Indonesia, the Philippines and Thailand for DDT to feed only malaria control or eradication projects is even more striking now than it was during the 1973 pesticide survey. If Indonesia and Thailand were to embark on a malaria eradication mission, such as their public health authorities desire, the cost differential at 1974 price levels over 1972-73 for DDT 75 percent water dispersible powders from imported sources to feed these programmes through 1981 would total something in the order of US$ 59,542,700. The total programme through 1981 for the two countries which in September 1973 appeared to cost US$ 135,324,319 would at the end of 1974 cost $US 194,867,019 with imported DDT.

The accumulation of events in 1973 which forced pesticide prices sharply upward in 1974 has, and this brief sampling of three ESCAP member countries which by proximity form a sub-regional unit reinforces that conviction, shown that regional or at the least sub-regional establishment of basic pesticide manufacturing facilities for a minimum of 3 to 4 commodity pesticide products is no longer a subject for speculation or discussion but one which requires decisive action and implementation.

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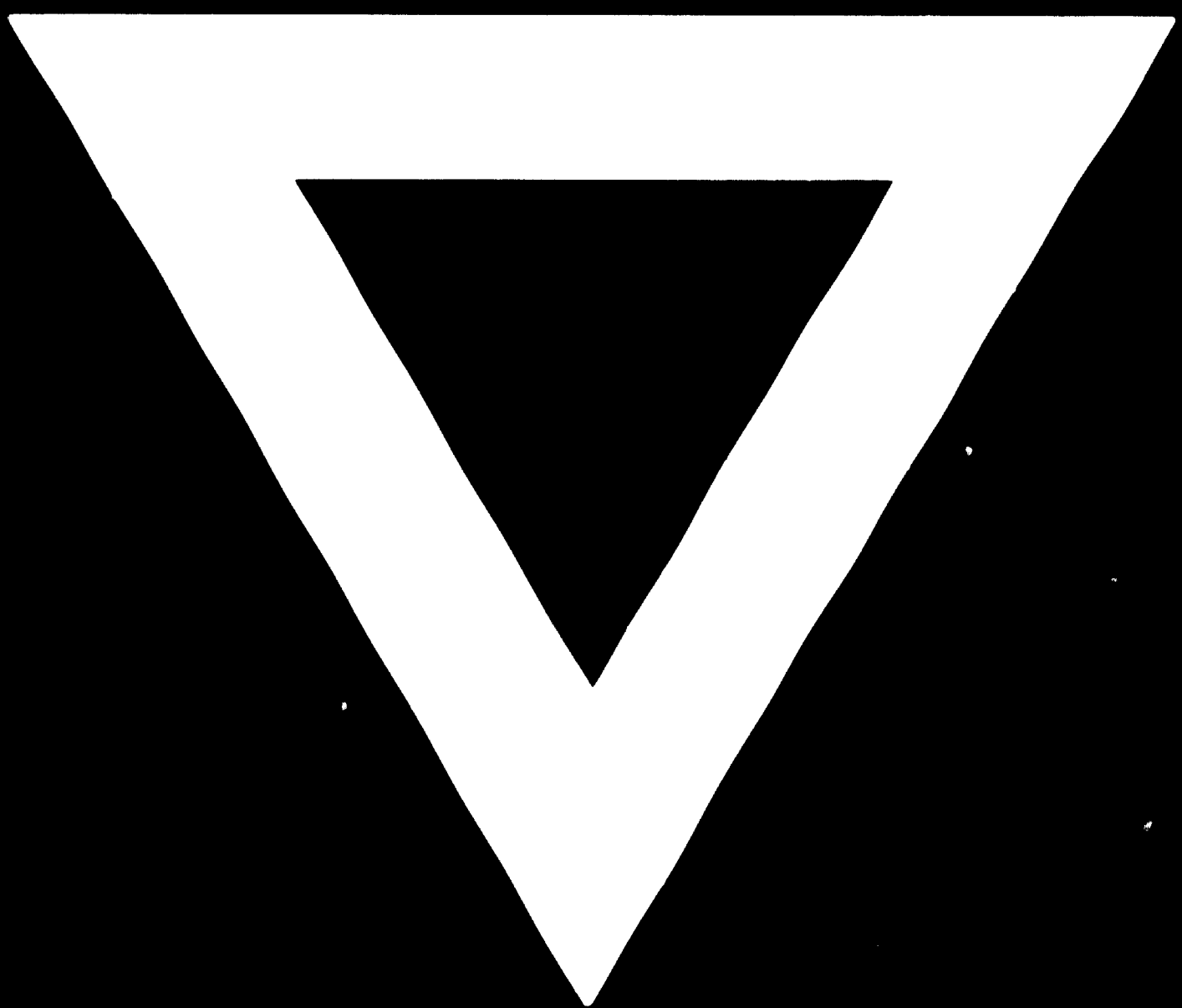

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