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AN ANALYSIS OF THE ECONOMIC POLICIES AFFECTING
THE PHILIPPINE COCONUT INDUSTRY

by

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The coconut industry has long been one of the largest users of agricultural land and labor in the Philippines. Being a major source of income for the rural population, it has, by its performance, been generally regarded as a predictor for general economic activity. Coconut exports have also been one of the country's major foreign exchange earners. The Philippines has been the top producer and exporter of coconut products in the world.

With such importance, the industry and the government policies in it are the focus of a public discussion as coconut farmers weather the current period of low coconut prices since 1980. When there is a proliferation of government policies in the industry in the context of an unprecedentedly prolonged period of low prices, there is the compelling suggestion for causation. Relative to earlier years, the government has intervened more heavily in the industry in the last decade with

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the export tax, the coconut levies, the establishment of the United Coconut Oil Mills (UNICOM), the coconut replanting scheme and other related programs.

One of the issues to surface in this discussion has been whether the CCSF levy, the largest tax on the industry in its entire history, has depressed farm prices (UCAP, 1979). Another has been whether the UNICOM, being the largest oil milling company of the country today, has also helped to lower these prices. Proponents of the CCSF levy cite the benefits offered by the programs funded by it. Foremost is the replanting program aiming for a dramatic increase in the country's coconut productivity. Some of the CCSF revenue has also been used to subsidize since 1973 cooking oil and other coconut-based consumer products. The UNICOM itself and its owner, the United Coconut Planters Bank, were purchased out of the CCSF revenue.

While indeed government intervention in the industry has increased during the 1970s, there is hardly any analytic study of its economic impacts. It is this paper's primary purpose to fill this gap.

The CCSF levy and the export tax drive a wedge between border and producer prices of copra. This wedge is apparently widened by government policies that limit competition. Lower prices for copra producers in turn are a source of protection for the country's coconut oil mills. The direct benefits to farmers from having the CCSF levy are relatively small and not widely available.

After giving an overview of the coconut industry (Section 1), we describe the major government policies affecting the industry (Section 2)

and present summary statistics which are indicative of the economic effects of these policies. The primary indicators are nominal and effective protection rates (Sections 3 and 4). This is followed by a discussion on the CCSF levy, its revenue and its benefits. We also discuss the replanting program, the vertical integration program, and ownership of the United Coconut Planters Bank and the UNICOM (Section 5).

In section 6, we measure the domestic resource cost (DRC) of copra production per unit of foreign exchange earned in the major coconut regions (Section 6). The results in Section 4, 5, and 6 will be summed up in Section 7; where we also attempt to provide directions for policy reforms.

1. The Coconut Industry

1.1. An Overview

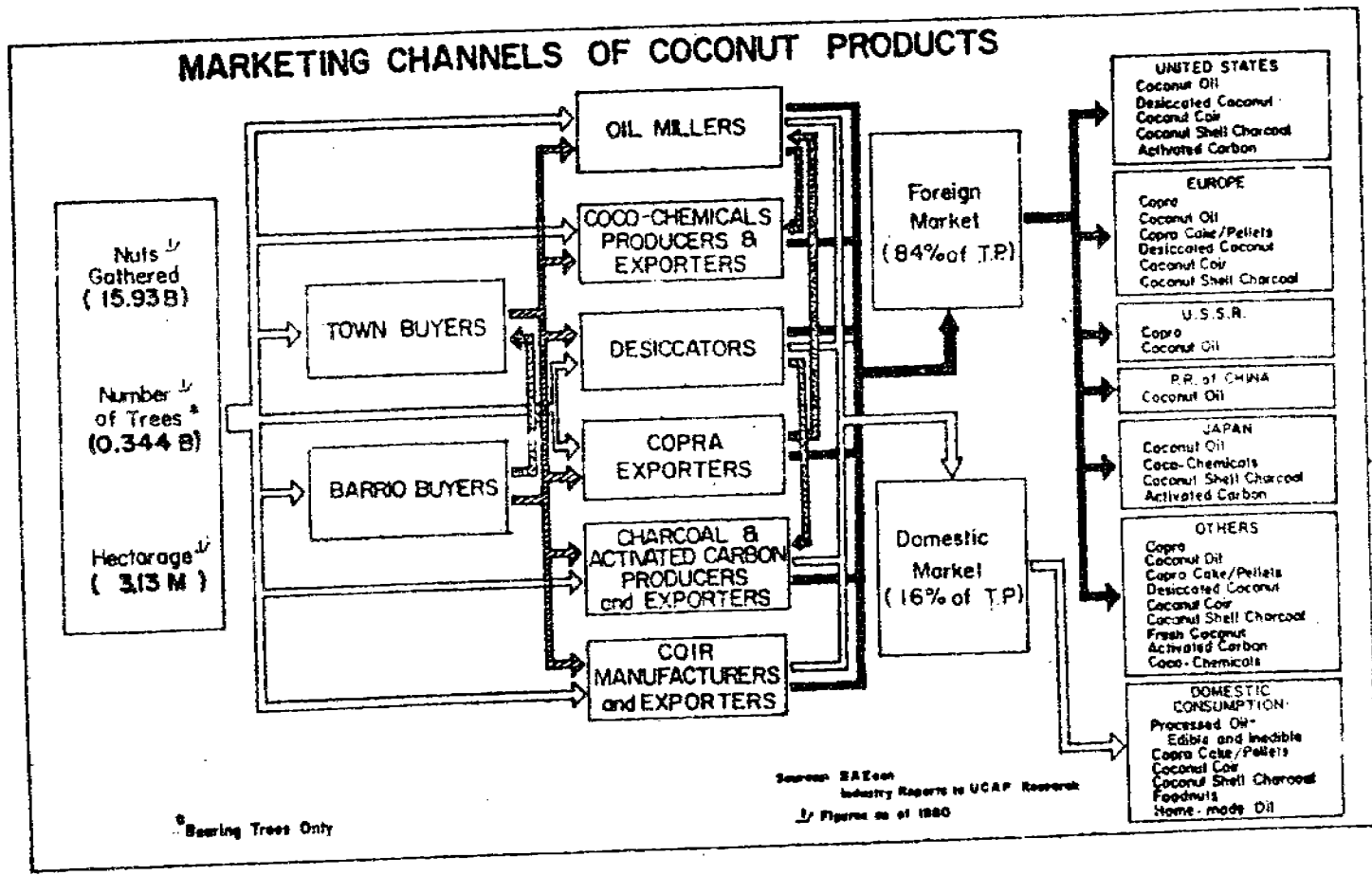
Generally, the industry is made up of three sectors: production, trading and processing. Figure 1 illustrates the interrelationship among the three in the marketing channels of coconut products. Copra and nuts are the main products in the production sector. In 1980, for example, about 15.93 billion nuts were gathered by coconut farmers. Out of this, over 90 percent was processed into copra, an input in coconut oil milling, while the rest was utilized to produce dessicated coconut.

Small farmers make up the production sector. Of the roughly half a million coconut farms reported in the 1970 census, about three quarters had a size under five (5) hectares. The average farm size was

2.4 hectares. About 18 percent of the total production in 1980 was consumed locally. The remaining 82 percent was exported mainly to the United States and Europe.

From the production sector, the coconut products flow to their users through the trading sector made up of town and barrio buyers. The users of these products are primarily the oil millers/exporters, copra exporters and dessicators/exporters. The oil millers also produce copra cake/pellets or copra meal, a by-product in milling. A few mills refine the crude coconut oil to produce cooking oil and other coconut-based consumer products for domestic consumption. Other users are the manufacturers and exporters of coco-chemicals, charcoal and activated carbon and coir. Together they make up the processing sector of the industry.

Figure 1.



1.2. The Industry in 1980

In 1980, the industry was the third largest user of land next to rice and corn. Coconut farmland was 3.13 million hectares or 25 percent of the entire cultivated area. A total of 420 million coconut trees had been planted, 82 percent of which were bearing.

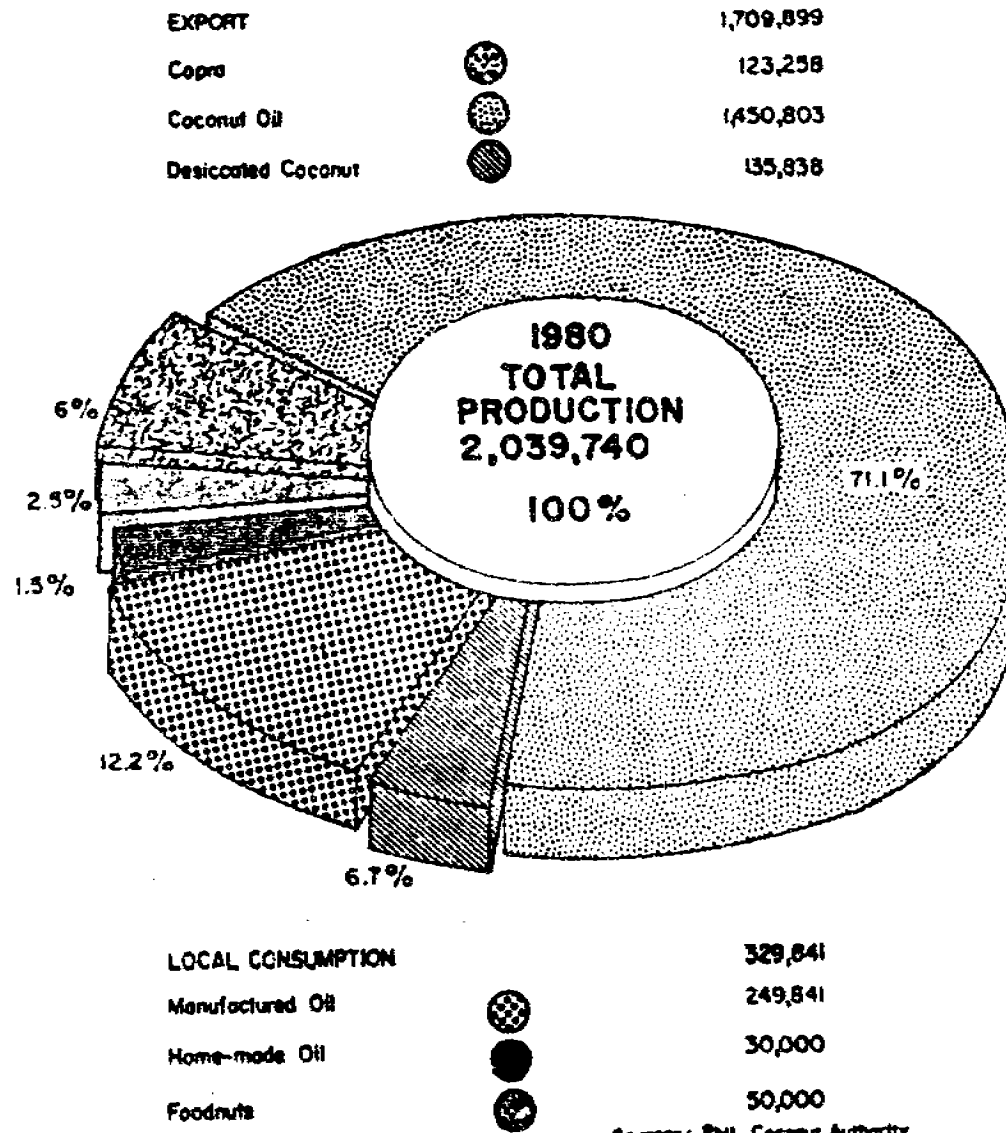
The total production of these farms was 15.93 billion nuts, equivalent to about 3.9 million metric tons of copra. Their value was ₱9.3 billion. Thus, coconuts were the top contributor among all crops to the national income of about ₱215.2 billion (1980 prices).

Next to mineral products, coconut exports were the second biggest foreign exchange earners of the country. Their value was US\$820.5 million, representing 14.2 percent of the value of total merchandise exports in 1980.

The utilization of coconuts is described in Figure 2. Of the total production in 1980, 71.1 percent was exported as coconut oil and copra meal; 6 percent as copra; and 6.7 percent as desiccated coconut. The rest was consumed locally as manufactured oil (12.2 percent), homemade oil (1.5 percent), and foodnuts (2.5 percent).

Table 1 presents the geographical distribution of the industry. About half of the total farm area and approximately 42 percent of the total stock of coconut trees were in Mindanao in 1980. The tree density in Central Visayas was relatively higher than in the rest of the country. In terms of yield, the national average was 46 nuts per bearing tree. The bulk of coconut oil mills and desiccating plants was in Luzon, especially in Metro Manila and Southern Tagalog.

Figure 2.
Utilization of Coconut Production: 1980



Sources: Phil. Coconut Authority
BAEcom
Prepared by: UCAIP Research

Table 1.
Some Information About the Coconut Industry,
By Region, Philippines: 1960

	Area Planted to Coconut (1,000 has.)	Total Coconut Trees (1,000 trees)	Trees Per Hectare	Yield (nuts per bearing tree)	Annual Rated Hilling Capacity (15' copra)	Hilling Units	Dessicating Plants
Philippines	3,186	417,362	133	46	3,324,600	65	11
Ilocos	923	133,451	144	45	1,446,000	38	8
Ilocos	13	2,314	176	49	—	—	—
Cagayan Valley	7	935	133	45	—	—	—
Central Ilocos	2	298	149	36	—	—	—
Northern Ilocos	546	94,652	171	63	1,250,000	35	—
Ilocos	355	35,412	101	34	160,000	3	—
Mindanao	615	110,710	177	32	389,100	7	—
Eastern Mindanao	94	14,736	156	40	45,000	2	—
Central Mindanao	162	36,966	240	31	306,600	4	—
Western Mindanao	359	59,007	153	27	37,500	1	—
Visayas	1,574	173,520	109	46	1,489,500	20	3
Central Visayas	337	43,275	109	46	—	—	—
Northern Visayas	118	14,258	122	36	—	—	—
Western Visayas	619	11,987	194	55	—	—	—

Sources: 1. Bureau of Industry and Agriculture
2. United Nations Commission of the Philippines

1.3. Patterns of Changes in the Industry

Increasing rates of growth in area planted and stock of trees were observed from the 1950s to the 1960s (Table 2). As a result, coconut output was also growing at an accelerating rate from 2.1 percent in 1960s to 7 percent during the last decade. Normally, the gestation period for coconuts is about 7 years. However, the growth of area planted and trees apparently slowed down in the 1970s.

The growth rate of production is apparently explained more by the growth rates of area planted and trees rather than that of productivity. The growth rate of yield was constant at about 2.7 percent (discounting the negative growth rate in the 1960s) while production was growing at an increasing rate.

In trade, coconut oil exports recorded the most impressive rate of increase both in volume and value. Recovering from their decline in the second half of the 1950s, they increased at an average annual rate of 25.5 percent per year during the last two decades. For copra exports, the rate of growth was steady at 5 percent per year for the same period. But their capability to generate foreign exchange appeared to have been eroded in the 1970s when the growth rate of their value dropped to 0.3 percent.

Copra and coconut oil have been the main foreign exchange earners among coconut products. There was a significant shift in the export-product mix from the leadership of copra in the 1950s and 1960s to the dominance of coconut oil during the last decade. This implies an intensification of coconut processing in the country in the same period.

Table 2.
Growth Rates and Some Changes
In The Coconut Industry: 1955 - 1980
(in percent)

	1955-1960	1961-1970	1971-1980
Growth Rates:			
Area Planted	0.8*	6.0	5.0
Total Trees	2.0*	5.0	4.0
Coconut Production	2.8*	2.1	7.0
Yield	2.6*	- 2.0	2.8
Volume of Exports:			
Coconut Oil	-0.4	25.0	24.0
Copra	2.0	5.0	5.0
Dessicated Coconut	8.0	8.0	5.0
Copra Meal	2.0	3.0	10.0
Value of Exports:			
Coconut Oil	3.0	27.0	30.0
Copra	3.0	4.0	0.3
Dessicated Coconut	10.0	4.0	31.0
Copra Meal	3.0	20.0	20.0
Share in Total Export Values:			
Coconut Oil	11.0	24.0	54.0
Copra	77.0	61.0	29.0
Dessicated Coconut	9.0	9.0	9.0
Copra Meal	3.0	6.0	8.0
United States	48.0	51.0	41.0
Europe	44.0	43.0	43.0
Others	8.0	6.0	16.0

* Average of ten years (1951-1960).

Source: Basic data drawn from Philippine Coconut Authority and BAECON, Ministry of Agriculture (for Area Planted and Trees).
The United States and Europe have been the major buyers of the country's coconut products. The country had apparently diversified its markets during the last decade, as shown by the increase in the share of the rest of the world to total export value from 6 to 16 percent. The new markets for coconut products included the Soviet Union and China.

1.4. Prices

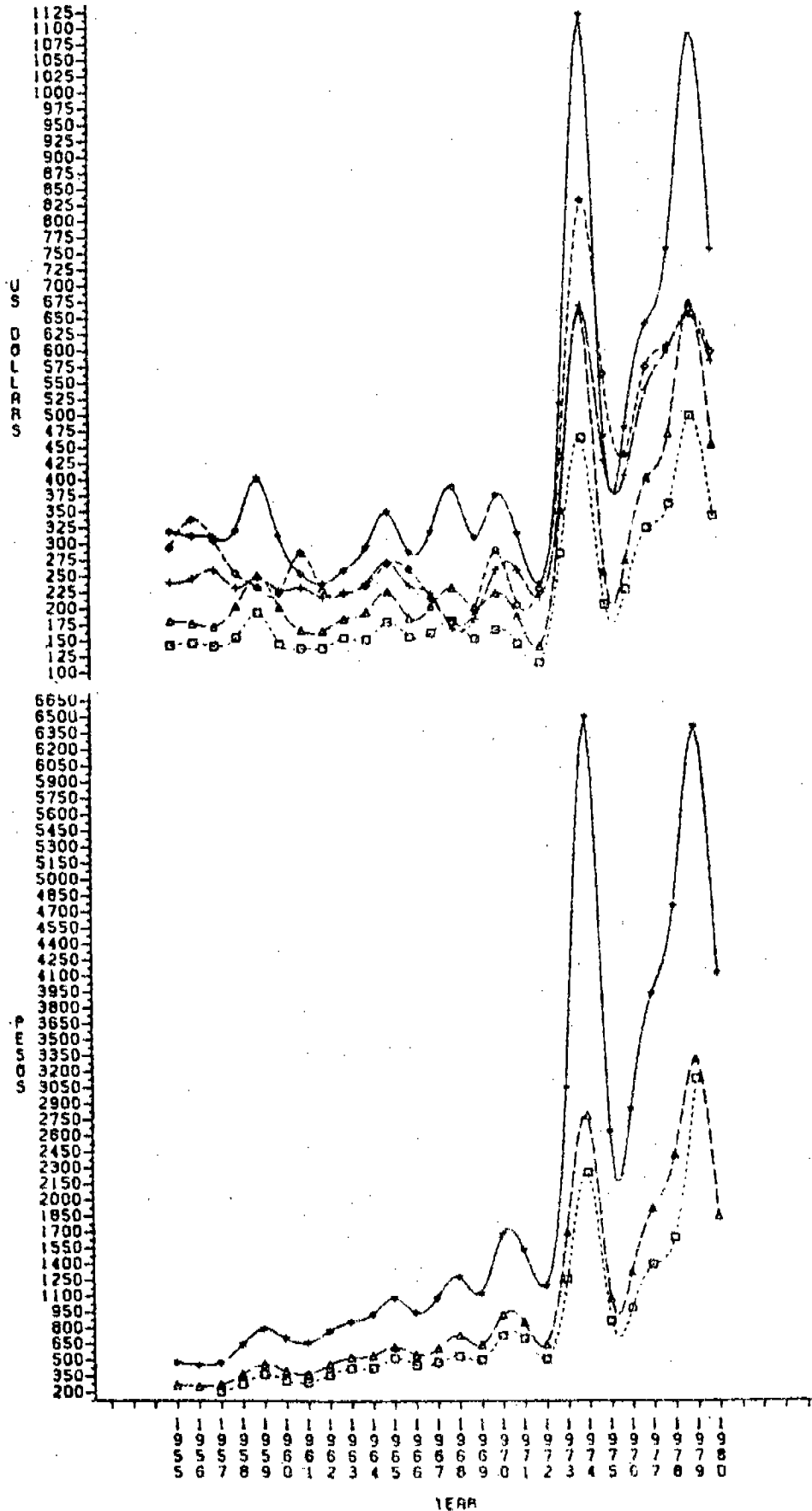
Fluctuating incomes of coconut farmers are characteristic of the industry. This is illustrated in Figure 3 which illustrates world and domestic prices of vegetable oils and oilseeds from 1955 to 1980. In the lower part of the figure, domestic prices of copra and coconut oil, given in pesos per metric ton, fluctuated considerably.

The upper part of the figure shows the plot of world prices of soybean oil, coconut oil, palm oil, copra and palm kernel (in US dollars per metric ton). It is interesting to note how these prices moved so closely with one another. This illustrates how these oils are close substitutes for one another - a finding relevant for the elasticity issue discussed in Section 3. Because of this and the fact that coconut oil constitutes only about 5.8 percent of the entire world production of food oils and fats in the last decade [UCAP, 1981], the world demand for Philippine coconut oil is likely to be highly elastic.

The price peaks in 1974 and 1979 were rather unusual. During both periods, acute shortages of the major food oils and fats in the world followed weather-induced shortfalls in their supply. The price increases in OPEC oil during these years aggravated the situation. Vegetable oils, like coconut oil, are substitutes for mineral oil in their non-food uses, e.g., production of chemicals. Accordingly, some switching to these from mineral oil must have been caused by the high OPEC prices, thereby further increasing their prices.

It was during the first price peak (which started in 1973) that the government intervened with the CCSF levy and the subsidy program. These were the policy responses to the disappearance of edible oil from the market. We will elaborate on this in the next section where we discuss the policies that have affected the industry.

FIGURE 3
 WORLD AND DOMESTIC PRICES OF VEGETABLE OILS
 AND COCONUT PRODUCTS: 1955-1980
 (PER METRIC TON)



LEGEND:
 UPPER STAR COCONUT OIL IN NEW YORK
 UPPER SQUARE PALM KERNEL IN EUROPE
 DIAMOND SOYBEAN OIL IN EUROPE
 PLUS PALM OIL IN EUROPE
 UPPER TRIANGLE COPRA IN EUROPE
 LOWER STAR COCONUT OIL IN MANILA
 LOWER TRIANGLE COPRA IN MANILA
 LOWER SQUARE COPRA AT THE FARMS

2. Policies Affecting the Industry

Before the 1970s, the economic policies affecting the industry were general in scope. The import controls in the 1950s and the decontrol program and the consequent retention scheme in the 1960s were overall economic policies for these years. Except for two insignificant industry taxes,¹ there were hardly any industry-specific policies. In contrast, more of the latter were decreed during the 1970s.

Another difference in the policy pattern during these periods was in the extent of taxation. Relative to earlier years, there were more and heavier explicit taxes on the industry in the last decade. With this as an overview, we present chronologically the important policies which have affected the industry.

2.1. Before the 1970s

The system of import controls in the 1950s, which in effect undervalued foreign exchange, implicitly taxed exports in general. The exporters lost by the difference between the free market and official values of their foreign exchange earnings. Thus, exporters had an incentive to understate their export volume in order to avoid this implicit export tax.²

A better picture emerged in the 1960s with the decontrol program and the gradual devaluation of the peso. However, implicit taxation on exports in

¹ These taxes were authorized to be collected in 1954 and 1955, respectively, in order to finance the Philippine Coconut Administration. Together, their rate was ₱1.50 per m.t. copra.

² Some evidence supporting this can be found in Darrah and Tiongson [1969].

general continued with the retention scheme policy of the Central Bank. Under this scheme, exporters were allowed to retain a portion of their foreign exchange revenue that they could sell at free market rates. The rest, however, were to be exchanged at the lower official rates, constituting a tax on their exports. This scheme was lifted in 1965 [Power and Sicat].³

2.2 Policy During the 1970s

2.2.1. The export tax

The floating rate policy in 1970 ushered in explicit taxation on exports in general. Largely in order to siphon off the windfall profits gained by exporters with the devaluation of the peso, the government through Republic Act (RA) 6165 explicitly taxed major exports in general. The tax was assessed on the f.o.b. value of exports.

The original plan in 1970 was to lower its rate every year until it would have been phased out in 1974. However, Presidential Decree (PD) 230 made export taxation a permanent policy of the government in 1973 [Yoingco and Quintos]. The decree also fixed the rate of the tax at 6 percent for copra and 4 percent for processed coconut products, as shown in Table 3.

3 Another general policy to note was embodied in the bilateral Laurel-Langley agreement between the Philippines and the United States. Starting 1956, coconut oil and copra meal exports to the US, provided they were within quota limits, were exempted from US duties. The agreement expired in 1974.

Table 3
The CCSF Levy and Export Tax Rates on Coconut Products: 1970-1981
(pesos/mt copra)

CCSF Levy						
Year	Period Covered Levy	Actual Rate	Average* Rate	Percent of Export Price	Copra Exports	Proceed Coconut Exports
1970	-	-	-	-	10	8
1971	-	-	-	-	8	6
1972	-	-	-	-	6	4
1973	8/10 - 12/14	150	60	4	6	4
	12/15 - 12/31	250				
1974	1/1 - 1/10	250	770	21	6	4
	1/11 - 5/23	550				
	5/24 - 11/5	1000				
1975	1/1 - 1/10	700	350	21	6	4
	1/11 - 5/18	400				
	5/19 - 12/31	300				
1976	1/1 - 12/31	300	300	20	6	4
1977	1/1 - 3/15	300	530	21	6	4
1978	3/16 - 12/31	600				
1979	1/1 - 12/31	600	600	13	7.5	4
1980	1/1 - 5/27	600	700	24	3*	2*
	5/28 - 7/12	suspended				
	7/13 - 12/31	1000**				
1981	1/1 - 9/9	1000**	800	31	lifted	lifted
	9/10 - 10/2	lifted				
	10/3 - 12/31	500				

* weighted average..

** on exported copra only.

Source: Philippine Coconut Authority

Another purpose of the export tax was to promote forward integration. Thus, processed exports were taxed two-percentage points lower than other exports. In 1979, the rate for copra was increased to 7.5 percent thereby increasing this differential. In 1980, the tax on coconut exports was lifted due to low coconut prices.

2.2.2. The COCOFUND Levy

In 1971, RA 6260 was passed whereby a fixed levy was to be collected from coconut producers for a period of ten years starting 1972. Called the COCOFUND levy, this tax was fixed at the rate of ₱5.50 per metric ton (mt) of copra and was to be utilized to underwrite the Coconut Investment Company.⁴ This company was to become the instrument whereby coconut producers could invest in the processing and trading of their products. To establish the ownership of this company, COCOFUND receipts were issued to coconut farmers upon payment of the levy during the sale of their products. These receipts were to be converted to shares of stock of the company.

Despite its small magnitude, the COCOFUND levy was significant in the 1970s because of its idea of vertical integration, i.e. farmers going into the business of trading and processing of their products, and due to the COCOFUND receipts. It helped shape the nature of the most important production levy on the industry in its entire history, the CCSF levy.

2.2.3. The CCSF Levy⁵

⁴ The government collects the tax directly from copra users, who in turn deduct the tax from their buying prices for copra. In other words, the price received by the farmers is the market price of copra at the farm less the COCOFUND levy. This same collection procedure is followed for the CCSF levy.

⁵ For a more detailed discussion on the history of the COCOFUND and CCSF levies, see David, 1977; UCAP, 1979; Clarete, 1980.

As stated above, the abrupt increase of coconut prices in 1973 led to the imposition of the CCSF levy. Since the cost of coconut inputs had gone up, the prices of basic coco-based consumer products rose significantly. The government then imposed price ceilings for these products which led to their disappearance from the market. Producers lost heavily in supplying the products at controlled prices while input prices continued to soar "by the day". To remedy the situation, the government subsidized the producers for their losses with funds coming from a new levy on coconut production. Thus, PD 276 (Table 4) imposed the CCSF levy on August 10, 1973 for this purpose. It set the rate initially at ₱150 per mt of copra, subject to change depending upon the funding requirement of the subsidy program. It further decreed that the levy was to be rescinded after one year or after the duration of the cooking oil crisis, whichever was earlier.

In 1974, however, PD 414 was issued to continue the levy thereby voiding the provisions of PD 276. The former added two new uses of the levy: to pay for about 90 percent of the premium duty and to allocate some funds for the Philippine Coconut Authority (PCA) to invest.

The premium duty was imposed in 1974 by Executive Order No. 425 to capture the windfall gains made by coconut exporters from any favorable market situations. The duty was assessed on the difference between the customs valuation of all exports and their respective base prices, as set by the National Economic Development Authority (NEDA). The tax rates were 30 percent for copra and 20 percent for processed coconut products. This duty was lifted in 1980, at the same time that the export tax was rescinded.

In a bid to increase coconut productivity, PD 582 was issued towards the end of 1974 to launch the national program to replant the country's coconut farms with a coconut hybrid. It created the Coconut Industry Development Fund

(CIDF) for the purpose. The CCSF levy was the instrument to raise revenue for this fund.

In 1975, the Philippine Coconut Authority (PCA) was allowed under PD 755, given out that year, to purchase, in behalf of the coconut farmers, the First United Bank. The capital it used in this venture was part of the funds allotted to it for investments under PD 414. This bank became known as the United Coconut Planters Bank (UCPB). The percent of equity held by the PCA in UCPB for the coconut farmers in general was 70 percent. To give this percent to the farmers, the PCA ruled that only those who owned COCOPUND receipts would be eligible to own shares of stock in the bank. Accordingly, for each peso of COCOPUND receipts, the PCA gave to the owner three shares with a par value of ₱1.00 each.

The UCPB became now the principal instrument by which coconut farmers could invest in processing and trading of their products. This was in accordance with the vertical integration program of the government for the industry, as spelled out in the COCOPUND law, RA 6260, and in PD 232 in 1973. But the most explicit statement for this program was given by the Revised Coconut Industry Code, PD 1468, in 1978. To give the program more funds, PD 1468 created the Coconut Industry Investment Fund (CIIF) again through the instrumentality of the CCSF levy. The CIIF has been managed by the UCPB.

By 1979, UCPB had bought out, with the CIIF, almost two-thirds of the country's total rated milling capacity. The newly acquired mills were consolidated under one company, the UNICOM, with government authorization and full support. This reorganization contrasts dramatically with the competitive history of the country's milling business. The events leading to this development can be partially attributed to some faulty planning on the part of the Board of Investments (BOI). Based on misplaced optimism about future copra

supply, the BOI continued in the second half of the last decade to grant incentives to investors in coconut oil milling until the milling business was overcrowded. The rated capacity exceeded by over a million tons the available copra supply. This, in turn, led to a tight competition for copra among its users. The problem was highlighted in 1979 when some of the new oil mills closed down. The government intervened shortly thereafter with Letter of Instruction (LOI) 926, the content of which will be discussed shortly.

Following a sharp decline in coconut prices in 1980, the CCSF levy was suspended on May 27, 1980 to resume 45 days thereafter, as provided in PD 1699. Upon its resumption, it received a new name, Coconut Development Project Fund. An initial levy of \$600 per metric ton was collected during the copra's first domestic sale, unless the product is destined for domestic consumption (which the user had to declare). An additional \$400 was to be paid by the exporters when they applied for export clearance. Thus, the new levy was roughly equivalent to an export tax of \$1000.

In 1981, the CCSF levy was lifted for about a month. When it was reintroduced, its name was changed for the second time to the Coconut Industry Stabilization Fund (CISF). In the first quarter of 1982, its rate became variable depending upon the level of coconut prices, according to a specified schedule; thus, the name "sliding levy".⁶

6 The sliding levy rates can be found in Far Eastern Economic Review, February 12, 1982 issue. It also came to our knowledge that the export tax was reintroduced in 1982. Other uses of the CCSF levy not covered in this section are: 1)The Coconut Farmers Refund, for the life insurance programs for the coconut farmers; 2)The Scholarship Fund, which the children of the farmers can earn on competitive basis; and 3)The Copra Price Stabilization Fund, for investments in copra trading, also in accordance with the vertical integration program as the CIIF.

Table 4

THE LEGAL BACKGROUND OF THE CCSF LEVY

Decree/LOI/ Implementing Orders	Date issued	Title	Important Provisions
P.D. 276	Aug. 20, 1973	Establishing the Coconut Consumer Stabilization Fund	It started the CCSF levy to effect a price stabilization scheme for coconut consumer products. Supervised by the Philippine Coconut Consumer Stabilization Committee.
P.D. 414	April 18, 1974	Further Amending P.D. 232 As Amended	PCCSC abolished and function given to PCA. CCSF levy collections were partly used for the vertical integration program and to absorb the premium duty.
P.D. 562	Nov. 14, 1974	Further Amending P.D. 232 As Amended	Established the CIDF for the replanting program. A permanent levy of ₱0.20/kilo from CCSF levy rate plus initial CCSF contribution of P100 million.
P.D. 755	July 29, 1975	Approving the Credit Policy of the Coconut Industry as Recommended by PCA and Providing Therefor	Approved the purchase of the First United Bank to become the United Coconut Planters Bank out of CCSF.
P.D. 1233	Nov. 8, 1977	Instituting a Procedure for the Management of Special and Fiduciary Funds	Implicitly declared that the CCSF is a special and fiduciary fund
P.D. 1468	June 11, 1978	Revised Coconut Industry Code	CCSF levy used for implementing vertical integration policy and price stabilization scheme. Declared CCSF as private. Established CIIF, Coconut Farmers Refund. Promoted COCOFED Developmental and Scholarship Program.
PCA Administrative Order No. 1 Series of 1979	April 19, 1979		Implements P.D. 1468. Established new Subsidy Scheme.
LOI No. 857	May 4, 1979		Established the CPSF. Allocates the Surplus of the Subsidy Fund to CIIF, Social Amelioration Fund, and CPSF at 24, 40, and 35 percent, respectively.
LOI No. 926	Sept. 3, 1979	Rationalization of the Coconut Oil Milling Industry	Established and gave full government support to UNICOM.
P.D. 1699	May 27, 1980	An Act Suspending the Collection of the CCSF Levy and Similar Levies and Providing in Connection Therewith Appropriate Measures to Cushion the Adverse Effects Thereof on the Coconut Farmers	Suspended the levy for 45 days. Established the CDPF.
	Sept. 9, 1981		The CCSF levy was lifted by President Marcos, only to be reimposed a month later. No formal Presidential Decree has yet been issued.

2.2.4. The UNICOM Policy

As stated above, LOI 926 outlined the government's policy response to the 1979 crisis of the country's oil mills. It authorized the creation of UNICOM. It instructed all relevant agencies of the government to give their full support to the company. Furthermore, it prohibited the establishment of new oil mills as well as the expansion of existing ones without the approval of the PCA. We will refer to this in the succeeding discussion as the UNICOM policy.

This policy has two features. One is the concentration of coconut oil mills in a single private company; the second is the restriction of the freedom of entry into the milling business. Thus, the UNICOM has not only become the largest seller of coconut oil, but also the biggest copra buyer in the country. The overall policy, therefore, restricts competition in both copra and coconut oil markets.

3. Theoretical Discussion

3.1. Nominal Protection Rates

The effects of the various policies discussed above can be conceptually illustrated in Figure 4. For purposes of illustration, assume that: 1) the world demand for Philippine copra is perfectly elastic; (2) the producers sell directly to the exporter or domestic user; and (3) the export tax and the CCSE levy, of which we further assume to have no exemptions and evasions, are the only relevant policies. S_1 is the marginal cost schedule in producing and marketing copra, while S_2 incorporates the per unit levy to this schedule. D_W is the world demand curve, while D_W' reflects the ad valorem export tax. Finally, D_d is the domestic demand schedule for copra. The distorted equilibrium is defined at the intersection of D_W' and S_2 . The vertical distance

between P_w and P_r is made up of two components: 1) the distance from P_w to P_u (user's price), representing the export tax; and 2) the distance from P_u to P_r , representing the CCSF levy.

Nominal protection rates (NPR) measure the policy-induced wedge between border prices (P_w) and producer prices (P_r). In the case of copra, this margin is primarily due to the export tax (t) and the CCSF levy (f).⁷ Thus, if we define NPR as the proportionate difference between P_r and P_w .

$$NPR = -(t + f).$$

Another policy that may reduce prices received by producers is the export ban. An export ban is equivalent to an export tax equal to the difference between actual border price and the price at which domestic supply equals domestic demand. This is illustrated in Figure 5. The export tax which would be just equivalent to an export ban is b . Thus, our corresponding formula for the case of export tax plus export ban is

$$NPR = -(t + b)$$

⁷ Note that the levy, f , is here expressed as a percentage of the fob world price. The taxes omitted are the COCOFUND levy and the premium duty. The former is roughly one percent of the border price of copra. Although the latter could be substantial, the exporters, nevertheless, paid only 10 percent of it. The rest was paid out of the CCSF levy, as provided in PD 414.

Since b is not readily observable, it may be preferable to estimate NPRs by directly comparing actual domestic and border prices. Care should be taken, however, to control for effects of quality, location and time [Medalla and Power]. Direct price comparisons also capture the effects of other policies, which are difficult to incorporate formally, such as the effect of the government's marketing policy.

3.2. Government Marketing Controls

If producer prices are subject to government controls, then NPR will differ from the wedge induced by taxation as the government's marketing agency, or its equivalent, raises or lowers the prices received by producers from competitive levels. If the agency is a monopsonist, for example, then it is able to collect marketing profits. Potential profits, however, can be dissipated by government inefficiencies in marketing.

Figure 6 illustrates how marketing profits help to lower producer prices. An additional curve is introduced, the distorted marginal outlay schedule of copra producers, S_3 . The new distorted equilibrium is defined at the intersection of D_w^i and S_3 . The difference between P_w and P_r is due to the export tax (represented by the distance $P_w P_u$), the CCSF levy (RP_x), and the marketing profits ($P_u R$).

Figure 4.
The Copra Market With The
Export Tax and The CCSF Levy

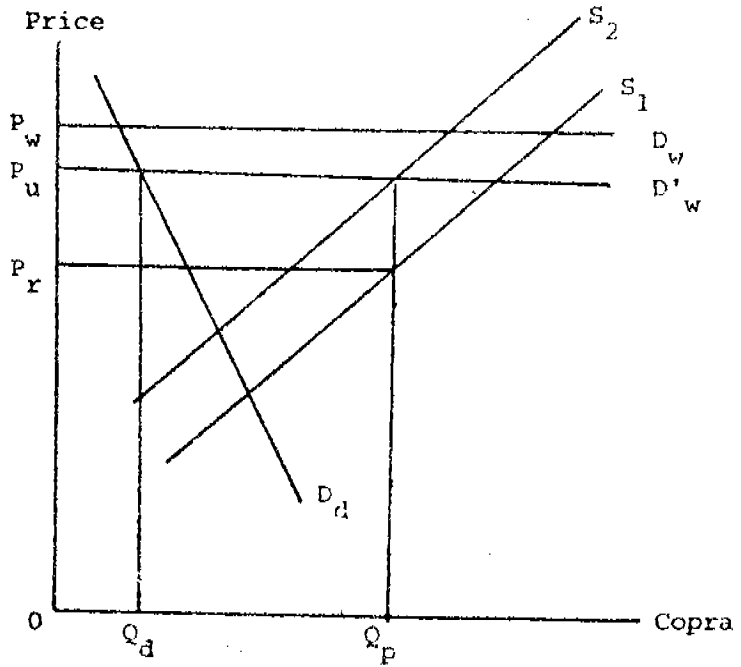
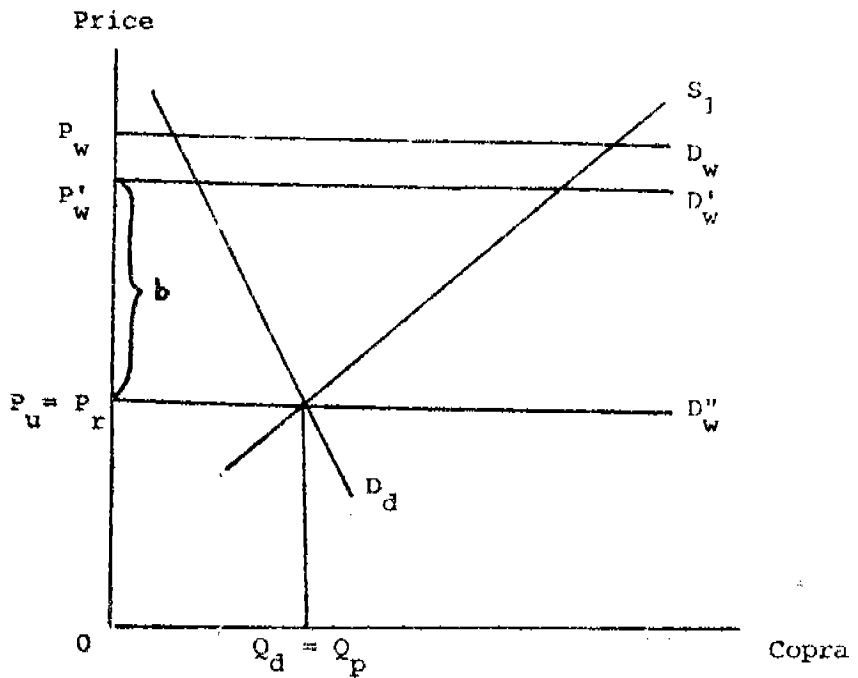


Figure 5.
The Copra Market With The
Export Tax and Export Ban



3.5. Elasticity of World Demand

If the long-run elasticity of world demand for Philippine copra is finite, then imposing an export tax, equal to the reciprocal of the elasticity of world demand (E_d) for Philippine copra, will increase efficiency. That is, the country exploits its monopoly position thereby taking in additional export receipts. Another way by which to capture these monopoly profits from the country's copra importers is by establishing a government marketing monopoly for copra, instructing it to maximize export profits. Whether such actions increase efficiency depends on the world demand for Philippine coconut products.

Econometric estimates of E_d (Velasco, 1975; Librero, 1971)⁸ tend to underestimate long-term elasticities. First, long-term elasticities are larger due to lags in changing habits and investment required to use coconut oil substitutes in manufacturing. In addition, available data is not appropriate for estimating elasticities. Some part of trade represents the execution of bilateral contracts, not activity in free markets. Furthermore, the contracts may be tied to trade in other commodities or to political factors. Some of these factors could potentially change in response to attempts to change prices.

The greater the substitutability between Philippine copra and other products and the less immutable are the political factors impinging on trade, the higher the elasticity. In the limit, if Philippine and other types of copra are perfect substitutes, then the demand elasticity for Philippine copra is equal to the world demand elasticity for copra divided by the Philippines'

⁸ For example, Velasco's estimates range from: copra 0.93 - 2.73; coconut oil 0.52 - 2.40.

market share.⁹ Given the relatively high substitutability between coconut oil and other vegetable oils, as we saw in Figure 3 above, the long-run world demand elasticity is likely to be quite large.

3.4. The Consumer Subsidy Program

The program aims to provide coconut-based consumer products such as cooking oil to consumers at artificially low prices. By converting the volume of consumption for these products into their respective copra equivalents, through the use of standard conversion factors, we can analyze the entire subsidy program in terms of copra.¹⁰

Figure 7 illustrates this particular approach. If P_u^* is the price ceiling, then P_u^* allows the producers of the controlled consumer products to earn normal returns, while complying with the program. Domestic consumption will be at Q_c . If the actual wholesale price, P_u , exceeds P_u^* , then producers lose by the amount indicated by the area $P_u E D P_u^*$. They will be compensated exactly for this out of the levy revenue, $P_u I A P_r$. Hence, the subsidy (S) is: $S = (P_u - P_u^*) Q_c$.

9 This can be seen by the following:

$$\frac{dQ^W P_w}{dP_w Q^W} = \frac{dQ_p^W P_w}{dP_w Q_p^W} \frac{Q_p^W}{Q^W} + \frac{dQ_o^W P_w}{dP_w Q_o^W} \frac{Q_o^W}{Q^W},$$

where P_w is the world copra price, and Q^W , Q_p^W , and Q_o^W are respectively the total world demand for copra, the world demand for Philippine and other countries' copra.

10 Converting different units of different coconut products in copra terms has been a common practice in the coconut industry. In fact, subsidy payments are based upon the volume of domestic consumption in copra terms of cooking oil, soap, and other coconut consumer products whose prices are subsidized. The United Coconut Association of the Philippines (UCAP) provides and continuously updates a conversion factor matrix for this purpose. See for instance UCAP, 1981.

Figure 6.
The Copra Market With The
Export Tax, The CCSF Levy and Marketing Control

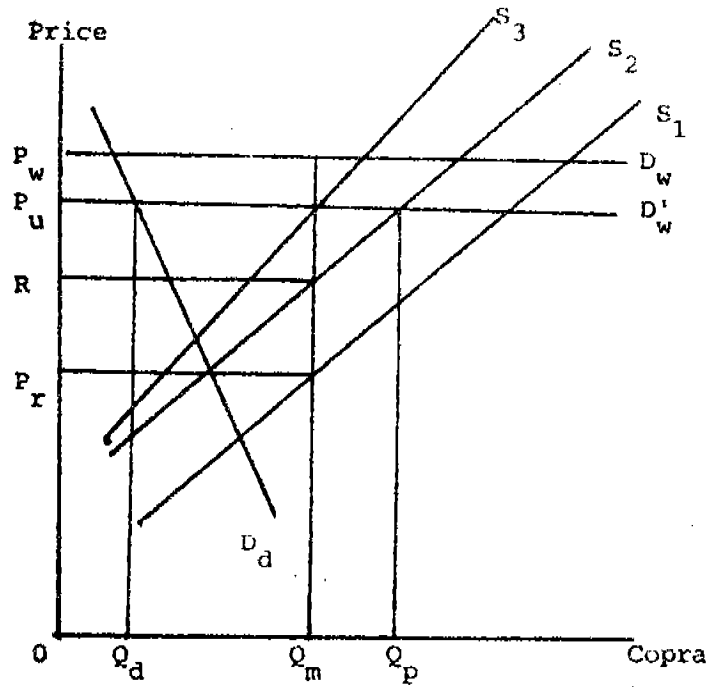
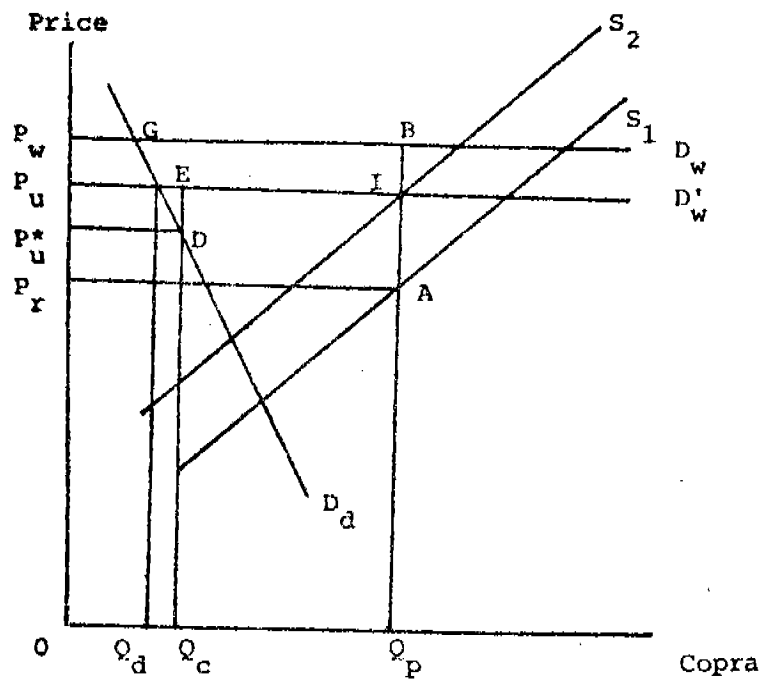


Figure 7.
The Copra Market With The
Export Tax, The CCSF Levy and Price Control



4. Empirical Estimates

4.1. Nominal Protection Rates for Coconut Products

Table 5 gives our estimates of NPR for coconut products from 1955 to 1981. The nature of the policies affecting copra producers prompted us to present two estimates for copra. The first was calculated using the formal tax structure (NPRF) and the second was computed by direct price comparison (NPRPC), the difference of the two we had discussed in section 3.1. We lumped all processed products together under one estimate because they are affected by similar policies.

4.1.1. Copra

The second column of Table 5 presents our NPRF estimates for copra. We do not have entries from 1955 to 1969 since the export tax and the CCSF levy, the policies considered in our NPRF formula, were introduced only in the last decade. The NPRFs are all negative implying that copra producers have been receiving negative protection from the two policies.

Looking at their period averages, the NPRF prior to the imposition of the CCSF levy in 1973 was - 8 percent. This became more negative, - 24 percent, from 1973 to 1979 reflecting the introduction of the levy. From 1980 to 1981, the NPRF fell further to - 29 percent, representing increases of the levy's rate during these years.

For the 1970s, the average NPRF was - 21 percent. This led us to conclude that on account of the export tax and the CCSF levy, copra producers and middlemen have been receiving, on the average, only 80 percent of the border price of copra.

We roughly verified this finding with our NPRPC estimates for copra shown by column 3. With the exception of the first, all entries are negative, again

implying negative protection.

Table 5.
Nominal Protection Rates For Coconut Products: 1955-1981¹
(in percent)

Year	Copra		Processed Products
	Formal Tax Structure (NPRF)	Direct Price Comparisons (NPRPC)	Formal Tax Structure (NPRF)
1955 - 1961		8	
1962 - 1965		- 17	
1966 - 1969		- 5	
1970 - 1972	- 8	- 13	- 6
1973 - 1979	- 24	- 18	- 4
1980 - 1981	- 29	- 42 ²	- 1
1955 - 1969		- 5	
1970 - 1981	- 21	- 22	-

¹ NPRs using the formal tax structure are reported in columns 2 and 4. For processed products, the relevant formal policy is the export tax. For copra, the CCSF levy is considered in addition to its export tax. Since the other processed coconut exports have the same export tax rate as coconut oil, the NPRFs for the latter can be applied also for the former.

² The rate reflects the UNICOM policy.

Source: Basic data drawn from the Central Bank, the Philippine Coconut Authority, the Bureau of Domestic Trade, and the United Coconut Association of the Philippines.

The average NPRPC from 1955 to 1961 is 8 percent.¹¹ The protection system (via tariffs) which continued to overvalue the peso and the introduction of the retention scheme in the the first half of the 1960s is suggested by the average NPR of - 17 percent from 1962 to 1965. Exporters were penalized twice: (1) The distorted exchange rate overvalued the peso; and (2) The exporters got less than this rate with the retention scheme. This implicit export tax apparently was passed on to copra producers creating the 17 percent wedge between domestic and border prices.

With the lifting of the retention scheme in the second half of the 1960s, the average NPR for this period improved from - 17 percent to - 5 percent.¹²

From 1970 to 1972, the average NPR deteriorated to - 13 percent clearly reflecting the introduction of the export tax. Then, it got worse from 1973 to 1979, -18 percent, suggesting the added imposition of the CCSF levy. What is very interesting was the dramatic fall of the NPR average from 1980 to 1981, - 42 percent. Can this be attributed to the UNICOM policy?

Before we attempt to answer this, the average NPRPC in the 1970s was - 22 percent. This tallies very closely with the NPRF average of - 21 percent. Despite the similarity between NPRPC and NPRF, there are two interesting differences between the two estimates. First, our NPRPC average is less

11 The use of the official exchange rate that artificially overvalues the peso in converting the border price from units of foreign exchange to domestic currency for purposes of price comparison resulted in positive NPRPCs for the second half of the 1950s.

12 This margin is interesting because it should give us a rough estimate of the marketing cost from the wholesalers' warehouses to the boats. To illustrate, suppose we just consider the average from 1967 to 1969 alone (assuming that the retention scheme was still reflected in 1966 prices), the average NPR was - 4 percent (not shown in the table). Thus, marketing costs were roughly 4 percent of the border price of copra.

negative than that of the NPRF during the period from 1973 to 1979. This came as a surprise since we expected otherwise on account of the other policies and marketing margins.

As an explanation of this finding, copra supply was short of milling requirements during two separate subperiods, 1973 to 1974 and 1976 to 1979. Furthermore, the subsidy program was operational since 1973. Our hypothesis is that all mills were forced to operate at less than their respective capacities because of the shortage. The producers of the subsidized coconut consumer products utilized the trading advantage provided them by the subsidy program over the other millers. The producers bid up copra prices to increase copra supply, operate at capacity, and increase profits. Thus, the NPRPCs for these years were less negative than the NPRF.¹³

The second difference we noted is that the NPRPC average from 1980 to 1981 was 13 percentage points less than that of the NPRFs. Considering that the UNICOM was already operational in this period, this differential suggests that UNICOM further depressed the price received by copra producers. However, we had almost the same picture in 1975 (not shown by Table 5). In both periods, there was a glut of copra in the world market. Thus, it is difficult to conclude for marketing profits on the basis of this finding alone. In fact, a different approach is needed to measure the effect of marketing controls. This is taken up in the next subsection. But before this, let us now turn to the NPRs for processed coconut products.

4.1.2. Processed Coconut Products

¹³ The other mills might have survived by being more speculative in their trading.

Like copra producers, the oil millers, the dessicators and the producers of other processed coconut products have also received negative protection from the government. Based on the formal tax structure, the average NPR for these products was - 4 percent for the last decade due to the export tax. However, the figure is small relative to the average NPR for copra, - 21 percent. This difference shows a strong policy bias for processed coconut products.

4.2. Estimating Marketing Profits

Considering that about 50 percent of coconut production is exported as coconut oil, domestic wholesale prices of copra follow very closely the price of crude coconut oil in New York. Figure 3 above confirms this observation. In practice, coconut oil exporters base their buying prices of copra on the coconut oil price in New York. The following is a schematic presentation of the theoretical relationship between these two prices:

Price of crude coconut oil in New York (\$/lb)
Multiply: 2,240 lb/mt (\$/mt)
Less: Freight and Insurance Costs (\$/mt FOB)
Less: Export Tax and Premium Duty on Coconut Oil (\$/my FOB after tax)
Multiply: Official Exchange Rate (#/mt FOB after tax)
Less: Crushing and Administrative Costs
Add: Value of Copra Meal Credit
Equals: Breakeven Price of Copra
Less: CCSF Levy
Equals: Domestic Price of Copra

Based on the above procedure, the "ten peso rule" has come to be used in the oil milling industry. It states that each US cent per pound of coconut oi

in New York is equivalent to ten pesos per hundred kilos of copra in Manila. We estimated in Appendix 1 the average relationship between the price of coconut oil in New York and the "border price" of copra in Manila. To get the time series of the latter, we added the export tax and the CCSF levy to the actual price of copra in Manila. This procedure provided rough verification of the ten peso rule.

To determine whether UNICOM extracted marketing profits from copra producers, we used the rule to predict the border price of copra in Manila, given the price of coconut oil in New York in the UNICOM years. We then compared this predicted price (minus the relevant taxes) with the actual wholesale price. The premium of the former over the latter was taken to be a measure of potential marketing profits. This approach assumes that competitive market conditions existed before the UNICOM period.

The calculations of the predicted price of copra are shown in Table 6 below. For 1980, the difference between the actual price in Manila and the predicted price was ₱45.42/100 kgs. copra. This was about 15 percent of the predicted border price of copra. For 1981, the premium was ₱23.00/100 kgs., or 9 percent also of the predicted border price.

This result suggests that copra prices were depressed below their competitive levels during the first two years of UNICOM's operation. What is not known, however, is whether the premiums we estimated constitute marketing profits or marketing inefficiencies. In either case, the UNICOM policy has apparently contributed to lower domestic prices of copra, thereby penalizing the copra producers even more.

Table 6.
Predicted and Actual Copra Prices in Manila: 1980 and 1981

	1980	1981
1. NY price of coconut oil (US cents/lb)	30.00	25.00
2. Predicted border price of copra in Manila (₱/100 kgs. copra)	300.00	250.00
3. Export Tax (%)	3.00*	0.00
4. CCSF Levy ^a (₱/100 kgs. copra)	70.00	80.00
5. Predicted Manila price of copra, after tax and levy	221.00	170.00
6. Actual Manila price of copra	175.58	147.00
7. Difference	45.42	23.00
8. Percentage of difference to predicted border price of copra in Manila	15.00	9.00
* weighted average		

Copra is the main input in producing coconut oil. The penalty provided to its producers by the export tax, the CCSF levy and the UNICOM policy during the last decade is a source of effective protection to coconut oil millers.

4.3. Effective Protection Rates (EPRs) for Coconut Products

Table 7 gives our estimates of the EPRs for three coconut products, copra, coconut oil (CNO) and dessicated coconut (DCN) from 1970 to 1981, subdivided into three subperiods on the basis of policy regimes.¹⁴ We estimated the input-output coefficients using the method described in Appendix 2. As mentioned above, copra is the major input for CNO, while it is fresh coconut meat for DCN. The following are our findings.

¹⁴ Effective protection rates are discussed in this volume. See also Tan [1979].

Table 7.
Effective Protection Rates for Coconut Products: 1970-1981
(in percent)

Period	Outline of Policies	Effective Protection Rates ¹		
		Copra	Coconut Oil	Dessicated Coconut
1970 - 1972	Export Tax	- 8	- 2.3	- 7.0
1973 - 1979	Export Tax, CCSF Levy	- 24	- 2.0	- 4.3
1980 - 1981	Export Tax, CCSF Levy, UNICOM	- 29	42.0	18.4*

* 1980 only.

¹ The main inputs in the production of coconut oil (CNO) and dessicated coconut (DCN) are respectively copra and coconut meat. The corresponding input-output coefficients for these were estimated using the method described in Appendix 2. For the other inputs, it was assumed that their coefficients are fixed at: 7% for CNO and 10% for DCN. The applicable tariff for these was 10%. In the case of copra, however, the tradable inputs were negligible and were thus assumed to be zero. The EPRs reported here are averages of estimated annual EPRs.

Source: Basic data drawn from the United Coconut Association of the Philippines and the Philippine Coconut Authority.

4.3.1. Copra

In copra production, tradable inputs are negligible. Thus, we treated the total unit value of copra to be the unit value-added in copra production. Accordingly, its EPR is equal to its NPR which needs no additional discussion.

4.3.2. Coconut Oil

Except for the last subperiod, CNO millers had been receiving negative effective protection. In the first subperiod, their EPR was - 2.3 percent but became slightly less negative for the second subperiod, - 2.0 percent. Since the CCSF levy had nothing to do with the market for CNO, it being a tax on all the marketed copra, the first two subperiods in the Table had essentially the same policy configuration - the export tax - except for the differential. Recalling the previous discussion, the export tax rate on processed products was two percentage points lower than that on copra. Since the copra/CNO coefficient was 68 percent, the differential had mitigated the penalty already received by the oil exporters from an export tax of about 4 percent.¹⁵

The two-percentage-point differential failed to completely offset the export tax. But by widening the differential in 1979, the government started to promote CNO production. In this year, the EPR was 0.9 percent (not reported in Table 7). This explains partly the increase of the EPR from - 2.3 in the first subperiod to - 2.0 in the second period including 1979.

This turnaround in policy from penalty to promotion was even more dramatic during the UNICOM years. The average EPR soared to a high of 42

15 In a previous work, the EPR for CNO was estimated to be - 5 percent for 1974 [Tan]. Tan used the NCSO estimate of the input-output coefficient of copra in CNO, which was 33 percent.

16 This is assuming that UNICOM did indeed collect marketing profits from copra producers. However, if the premiums that we estimated in the previous (Footnote continued)

percent.¹⁶ Marketing profits in copra trading are additional sources of protection for oil millers.

4.3.3. Dessicated Coconut

As in the case of coconut oil (CNO) millers, the dessicators had been penalized with the export tax. The EPR for DCN in the first subperiod was - 7 percent. It became less negative from 1973 to 1979, - 4.5 percent. Finally, we also observed that the EPR became positive, 11 percent, during the UNICOM years. Coconut meat is the main input in DCN (about 45 percent of the total value of DCN). Since it is mainly used to produce copra rather than DCN, it shares the negative protection that copra suffered with the export tax and the UNICOM policy.

In this section, we present and interpret our empirical estimates of NPR and EPR for coconut products. These indicators describe how the policies affecting the coconut industry have provided incentives and disincentives for the production of the major coconut products. Of the policies we mentioned, the CCSF levy has been shown to be the most important single policy in the coconut industry. In the following section, we will discuss the issues pertinent to it.

5. The CCSF Levy

5.1. Revenue and Disbursement

16(continued)

subsection were marketing inefficiencies passed on to copra producers, the average EPR would still be - 2.3 percent.

The size of the revenue from the CCSF levy has been of central importance in levy-related discussions. Because it is legally defined as private, the government which collects it is not constrained to make this information public. However, official figures about it get published occasionally [David, 1977; Business Day, 1980]. Based on the latest information, the total levy collected until the third quarter of 1980 is ₱5.815 billion [Business Day].

Unfortunately, the figures that were reported are cumulative revenues for periods spanning several years. It may be more instructive to have a picture about the size of its annual collection. Table 8 attempts to provide it. The estimates for the period from 1973 till 1976 were estimated in Clarete [1980], based on David's report about the total collection until the first quarter of 1977 [David]. Starting with 1977, the revenue was calculated as the product of the applicable levy rate and the volume of production, assuming no evasion by copra users.

Thus, the total potential revenue until 1980 was about ₱7.316 billion with the average annual collection of about ₱1 billion. This is greater by ₱1.5 billion than the amount reported in Business Day. A possible explanation for the discrepancy is levy evasions.

Table 8.
The CCSF Levy Revenue Estimates: 1973-1980¹

Year	Copra Production Subject to Levy (million MT) ²	Applicable Rate (₱/MT)	Revenue (million pesos)
1973	-	-	113
1974	-	-	1,024
1975	-	-	695
1976	-	-	765
1977	2.3	530	1,219
1978	2.4	600	1,400
1979	1.8	600	1,080
1980	1.4	700	980

- 1 Estimates for 1973 up to 1976 are from Clarete (1980). Starting with 1977, the estimator is: Revenue=Copra x Levy rate (rounded to the nearest million pesos).
- 2 Three percent of total production does not enter the market (rounded to the nearest hundred thousand. For 1980, the figure is total coconut exports in copra terms. Adjustment was made to account for the 45 days in 1980 when the levy was suspended.

Table 9 shows how the levy was allocated to its different uses since its inception in 1973 till 1981. We distinguish seven major uses of the levy: (1) subsidy program; (2) premium duty; (3) replanting program; (4) PCA development program; (5) COCOFED development program; (6) welfare program; and (7) Coconut Industry Investment Fund (CIIF). The distribution of the levy rate had been changed eleven times. The last apportionment may be regarded as typical because it had the longest duration.

Business Day [1980] reported total disbursements made of the levy revenue from 1973 till the third quarter of 1980 (Table 10). About ₡2.2 billion or about 37.8 percent of the total amount of the revenue, were deposited with the UCPB for the replanting program. Subsidy payments amounted to ₡1.5 billion, or 25.8 percent. Refunds to coconut farmers (or funds for the insurance program for coconut farmers) totaled ₡563 million, or about 9.7 percent of the total. The PCA received ₡567 million which it spent for its operations, research and other investments for the industry's development. The COCOFED got ₡309 million for its operations, scholarship program, and its other development projects. The CIIF, which is managed by the UCPB, accumulated assets to ₡389 million. Payments for the premium duty amounted to ₡265 million. The remaining ₡22 million were expended on "operational costs, refunds of withholding subsidy and short levy, and bank charges" [Business Day].

5.2. Benefits To Coconut Farmers

Figure 8 describes the flow of the levy revenue from the coconut farmers up to the different agencies supervising its various uses. It is interesting to note that the direct benefits from this levy to the coconut farmers include only the insurance program, the scholarship program and the subsidy program. Based on the Business Day data (Table 10), the disbursements made for the

Table 9

BREAKDOWN OF LEVY RATES AND PERCENTAGE SHARE
(in P/c.k.)

Period	Dates Covered	Subsidy		Replanting Program		Premium Refund		PCA Development		COCOFED Development		Welfare Program		CIF		Total	Duration (in months)
		Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%		
1	Aug. 10-Dec. 14, 1973	15	100	-	-	-	-	-	-	-	-	-	-	-	-	15	4
2	Dec. 15-Jan. 10, 1974	25	100	-	-	-	-	-	-	-	-	-	-	-	-	25	2
3	Jan. 11-May 21, 1974	55	100	-	-	-	-	-	-	-	-	-	-	-	-	55	4
4	May 22-Nov. 5, 1974	55	55	-	-	30	30	13	13	2	2	-	-	-	-	100	5
5	Nov. 6-Jan. 10, 1975	40	57	-	-	15	22	13	19	2	2	-	-	-	-	70	3
6	Jan. 11-May 19, 1975	5	12.5	20	50	-	-	13	32.5	2	5	-	-	-	-	40	4
7	May 20-Sept. 19, 1975	-	-	20	67	-	-	8	27	2	6	-	-	-	-	30	4
8	Sept. 20-Oct. 31, 1975	-	-	20	67	-	-	7	23	2	6	1	4	-	-	30	1
9	Nov. 1-March 18, 1977	2	6	20	67	-	-	5	17	2	6	1	3	-	-	30	17
10	March 19-Aug. 17, 1977	32	53	20	33	-	-	5	8	2	6	1	2	-	-	60	17
11	Aug. 18-Sept. 9, 1981	12	20	20	33	-	-	2	3.3	2	3.5	15	27	8	13	60	53

Source: FCSF.

Table 10

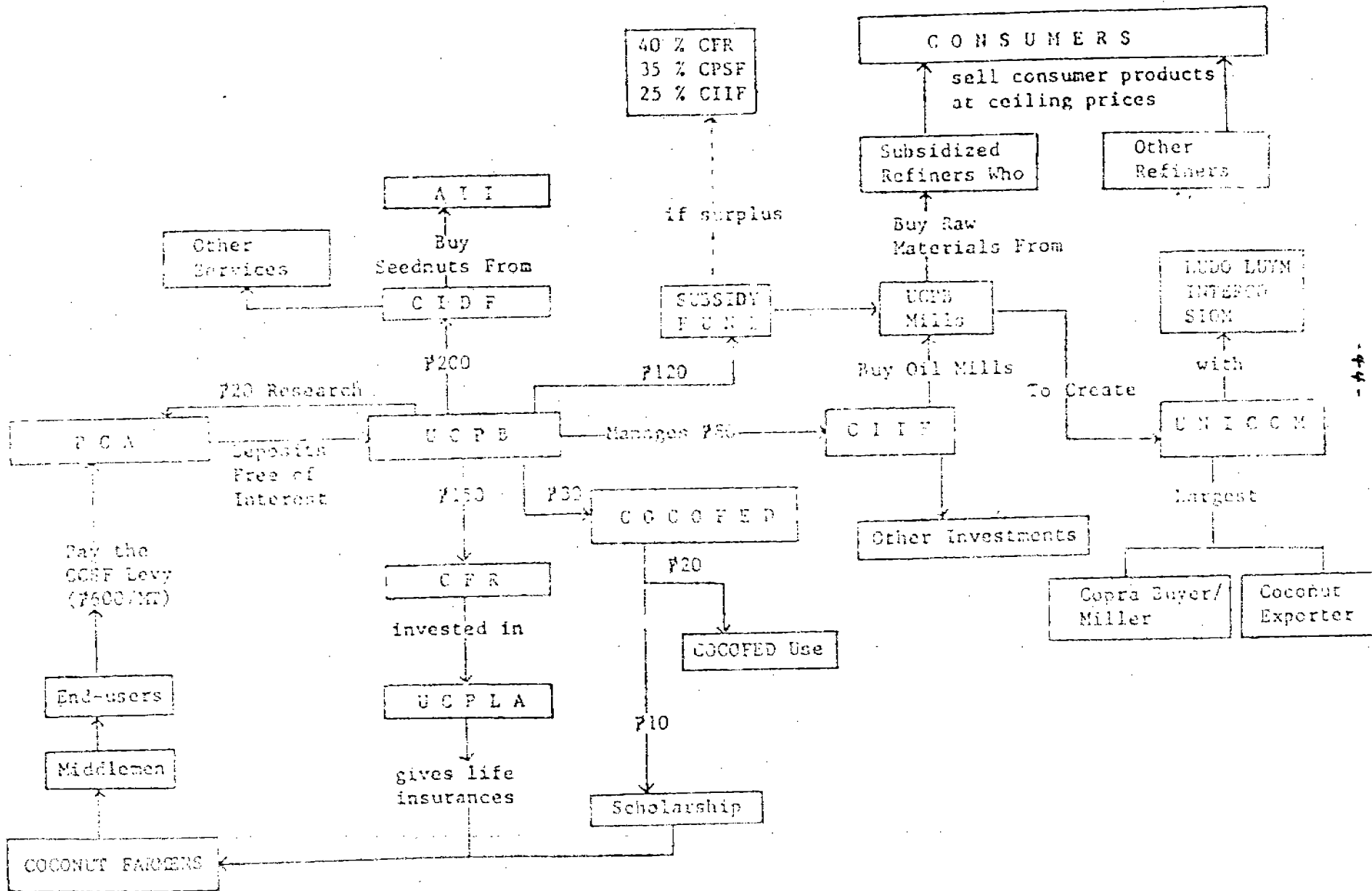
DISBURSEMENTS OF THE CCSF

Item	Amount (billion pesos)	Percent
1. Replanting Program (CIDF)	2.2	37.8
2. Subsidy Program	1.5	25.8
3. Coconut Farmer Refund	0.563	9.7
4. PCA	0.567	9.8
5. COCOFED	0.309	5.3
6. Coconut Industry Investment Fund	0.389	6.7
7. Premium Duty	0.265	4.6
8. Miscellaneous	0.022	0.3
TOTAL	5.815	100.0

Source: Business Day, "Coconut Fund Nearing P6 Billion," September 1, 1980.

Figure 8

The Coconut Consumer Stabilization Fund (CCSF) Flow



insurance program (or the item Coconut Farmer Refund) was only 9 percent of the total levy revenue. The scholarship fund constitutes a third of of the allocation given to the COCOFED, which is about 2 percent of the entire revenue.¹⁷ The subsidy program accounted for about 25.8 percent of the levy.

A closer look at these returns reveals that they are contingent benefits. The benefit from the life insurance and the scholarship programs are contingent respectively upon their death and the academic qualifications of their children. Furthermore, they can only benefit from the subsidy program if they were consumers of coconut-based products, such as cooking oil.

5.3. Replanting Program

The government aims to replant 60 percent of the country's coconut plantations with a coconut hybrid (a cross between the West African tall and the Malaysian dwarf) by the year 2020. This hybrid variety is alleged to have a higher yield in terms of nuts per tree and a shorter gestation period than the predominant native variety. Funding for this comes from the CCSF levy.

The contract to supply all the seed nuts required by the program was awarded by the National Investment and Development Corporation to Agricultural Investment Inc. (AII). AII developed 1,500 hectares in Bugsoc Island near Palawan. According to contract, the government will buy all the seed nuts produced by AII at ₱7.00 per nut and will distribute them free to the farmers. These sales are exempted from taxation by virtue of PD 582. In 1980, the program was supposed to be operational.

Up to the present, there is no evidence that the technology is widely accepted by coconut farmers. Serious problems may have prevented the program

¹⁷ The COCOFED had been given ₱3 out of every ₱60 of the levy revenue. ₱1 out of this was allotted for the scholarship program.

from taking off. One of these is the apparent reluctance of coconut farmers to adopt the new technology. The following might be an explanation of this problem.

The hypothesis that farmers are resistant to change appears to be inconsistent with available evidence. Low-income farmers in a wide variety of situations have been shown to adopt new technology when it is profitable to do so (Schultz, 1964; Roumasset, 1976; Herdt and Mandac, 1981). The farmers may be reluctant in adopting this hybrid because private benefits of the new technology are less than the costs. The net benefits for this hybrid may have been overestimated for several reasons.

1. The alleged benefit of this technology is its high yield. Yield is measured in terms of nuts/trees. Unfortunately, the hybrid nuts are at most two-thirds of the average size of the native nuts. Thus, the yield advantage may have been overestimated. For purposes of comparison, a measure of yield in terms copra/tree should be used.
2. The hybrid has not been tested on a long-term basis for its resistance to local diseases and pests. Expected yield of this hybrid may not be as high as estimated from experimental growth.
3. As stated above, the hybrid nuts are smaller. This implies that there are additional husking costs in getting the same amount of copra from these nuts.
4. Finally, a peculiar characteristic of this hybrid is that its trees are shorter. This is an advantage as well as a disadvantage. The advantage is that the costs of gathering the nuts from the tree can be substantially reduced. On the other hand, there may be additional costs associated with preventing these nuts from being stolen.

The rationale for this particular intervention in the form of taxing farmers to make them replant a new variety are not clear. A superior coconut technology is likely to be adopted eventually by coconut farmers given time for it to prove its worth. A voluntary program, with modest incentives and better information might be the right approach here, just as in the case of adoption of new rice varieties.

5.4. The Vertical Integration Program

The vertical integration program seeks to enable the coconut farmers to go beyond their customary functions at the farm and become traders, processors, and bankers, as well. The UCPB and the UNICOM, which controls at least 75 percent of the country's rated milling capacity, represent the concrete embodiment of this program. In principle, the farmers own the UCPB which in turn owns the UNICOM.

An important issue in levy-related discussions is the ownership of the UCPB. We recall that this bank was purchased with levy revenue and that its shares were distributed by the PCA to the owners of COCOFUND receipts in 1975. According to a nationwide survey by the Ministry of Agriculture (Valiente et al.), about 59 per cent of the sample of coconut farmers received the COCOFUND receipts, which became the basis in owning shares of the UCPB. Of these, only 49 per cent registered them. Thus, the sample proportion of farmers who owned these receipts was about 29 per cent at the time of the survey. About 35 per cent of those who had the receipts failed to register them.¹⁸ Even if there was a sufficient campaign by the PCA to encourage all of those farmers to register, the sample proportion of receipt owners would only be about 50 per cent. Hence, these statistics suggest that only about half of the country's coconut farmers could have equity in the UCPB. Furthermore, they imply that part of the UCPB equity that should have belonged to the farmers is owned by some other individuals.

18 Registering the COCOFUND receipts with the COCOFED town chapter president or with the municipal treasurer establishes ownership of the receipts. According to the survey, the remaining recipients gave the receipts to their landlords or to the PCA.

As a group, farmers own 70 per cent of UCPB's total equity. The remainder is held by the bank's former owners. In 1975, the bank's aggregate resources was ₱706.5 million.

How much could a small coconut farmer invest in the UCPB. Based on 1970 census figures (PCARR, 1980), the average size of a coconut farm for the bottom 2/3 of all farms in 1971 was 2.4 hectares. Using 1980 productivity and conversion figures, the average farm produces about 3.04 tons of copra per year. This implies that the average farmer pays about ₱17 of COCOFUND levy each year for which he is given a receipt. He could have accumulated about ₱68 worth of COCOFUND receipts from 1972 when the COCOFUND levy was imposed to 1975 when the UCPB was purchased. If he registered and converted these to UCPB shares, he could have invested about ₱204 in the bank.

With respect to the domestic trading of copra, UNICOM stands as the largest single buyer. This could result in economic inefficiency if UNICOM purchases copra at prices below competitive levels. With regards to equity, this implies some income transfers from coconut farmers to UNICOM. In the export trade, UNICOM becomes the sole exporter of coconut oil. Considering its importance to the economy, there is some risk where foreign exchange earnings depend solely on the goals of UNICOM and its skill in reading the developments in the volatile fats and oils world markets. For example, if UNICOM mistakenly thinks that it can extract long-run monopoly profits in world trade, then it can do damage to the economy by attempting to act as a monopolist. The high degree of substitutability in oils can frustrate attempts to act like OPEC. Rather than bringing extra revenue to the economy, UNICOM might damage the country's reputation as a reliable supplier of coconut oil and in the long run undermine its share in the oils market.

One argument for UNICOM is that the oil milling industry could avoid through the UNICOM a repetition of what happened in 1979 when an acute shortage of copra supply forced the millers to compete tightly among themselves. This led to wasteful procurement of copra as millers in Luzon acquired copra from Mindanao, while those in Mindanao purchased copra in Luzon. Unfortunately, the UNICOM policy, as a solution to the problem at hand, had an unintended effect - introducing monopolistic practices in what was essentially a competitive coconut oil milling business.

Another issue is the claim that the UNICOM policy promotes better income distribution since it is owned by the coconut farmers. This argument is sound if the program distributes its gains more to small than to large coconut farmers. In principle, it is at least neutral to the intraindustry distribution picture. On the other hand, the overall income distribution picture improves if the program raises the incomes of coconut farmers in general relative to the rest of the population.

We pointed out above that only about 50 percent of the coconut farmers at most could have equity in the UCPB and thus the UNICOM. Even if the farmers do indeed control the bank, it does not follow that they can be in a better income position than before. They cannot exploit themselves. It is even possible that they would be worse off as they pay for costs associated with being in three sectors of the coconut industry - production, trading and milling - simultaneously. Perhaps this raises a question about the entire idea of vertical integration.¹⁹

19 While economies of scale may be gained in integrating, it is more likely, however, that the transaction costs to do it outweigh the benefits, at least for the coconut industry, wherein the production sector is made up primarily of small coconut farmers.

6. Domestic Resource Costs for Copra

6.1. Definition

The domestic resource cost (DRC) of a given exportable is the total domestic social cost of a unit of its net foreign exchange earnings. The DRC is an index of comparative advantage at the margin, i.e., it indicates the relative efficiency of small changes in various production activities. More precisely, the ratio of DRC to the shadow exchange rate (SER) indicates comparative advantage only if it is less than unity (Pearson, et.al.).

In general competitive equilibrium, the marginal net social profitabilities of all uses of domestic resources are all equal to zero. In the absence of distortions, the DRC for each product will equal the equilibrium exchange rate. With distortions only in product markets, DRC expressed in units of the foreign currency is just the effective protection rate plus one (Krueger, 1972)²⁰ That is, the DRC is merely another indicator of the level of protection (Bruno, 1972). If, however, there are also distortions in factor markets, this simple relation between DRC and EPR does not hold.

The DRC measure of comparative advantage is thus partly a reflection of government policy. The DRCs of a given product in different regions that face the same policy should equalize. Moreover, differences in marginal comparative advantage across products only reflects differential incentives.

20 This is only approximately correct since distortions in the product markets can induce deviations in shadow prices of factors from market prices (Sieper, 1981).

Thus, we expect a correlation between DRC and EPR in any empirical work (see e.g., Bautista and Power, 1979). However, this correlation does not imply that the government tends to protect inherently inefficient industries. Rather this relation illustrates that at the distorted equilibrium the opportunity cost to society of the resources drawn into the protected sectors increases relative to the resource cost in unprotected industries. In other words, the government is protecting inefficient production at the margin.

In this section, we calculate the DRC of copra²¹ in 1976 of the main coconut regions of the country: Southern Luzon, Mindoro, Central Visayas, Western Visayas, Samar and Northern Mindanao. Following our discussion above, we compare our DRC estimates first with the OER then with the SER.

First, we go over our input-output data and our shadow pricing procedure.

6.2. Data

The data base comes mainly from the nationwide socio-economic and marketing survey of coconut farmers, conducted by the Special Studies Division of the Ministry of Agriculture (Valiente, et.al.) This study covered a sample of 2,850 farms and about 550 coconut traders distributed across ten regions in the country. It took three years (1975-1978) to complete the survey.

Table 11 gives some relevant economic information from the survey. From

21 The DRC of processed coconut products were estimated for 1974 based on the 1974 input-output table (Bautista and Tecson). The estimates, in pesos, are:

Coconut oil	3.48
Dessicated Coconut	4.96

the table, the survey was conducted at different periods, giving the problem of standardizing the timing of the information from each region. Thus, we converted the values of land and capital invested in coconut farming to 1976 values using the implicit growth rate of credit to the coconut industry [see PCARR, 1980]. More difficult to standardize was the coconut yield for each of the regions. We replaced the yield information from the survey with the the 1971 to 1976 average of BAECON yield data for each of the regions.

A different problem concerned the treatment of missing values. Rather than defining them to be zeros as what the survey report did, we ignored them in calculating averages.

Table 11.
Some Economic Information On
Coconut Farms, By Region: 1976
(per hectare)

	Southern Luzon	Mindoro	Central Visayas	Western Visayas	Samar	Northern Mindanao
SSD Conducted In:	1976	1975	1977	1976	1975	1976
Labor Utilization (Mandays) ¹ :						
Planting	3.3	2.4	4.0	5.2	3.4	4.2
Fertilizing	0.9	0.3	1.7	0.9	3.1	3.1
Weeding	5.8	4.0	4.2	3.9	4.8	6.3
Harvesting	12.0	11.6	14.2	14.2	11.0	10.8
Copra Making	7.3	9.5	13.5	7.3	8.7	11.3
Value of Land and Invested Capital ² (pesos):						
Coconut Land	3,316.47	3,316.47	5,093.82	5,708.28	2,681.26	3,821.90
Buildings	109.54	109.54	84.41	80.18	62.33	125.07
Tools	41.75	41.75	10.88	14.20	71.52	30.61
Work Animals	220.09	220.09	109.12	202.37	266.23	226.65
Average Yield ³ (1000 nuts)	3.014	3.014	4.484	5.047	4.875	5.341
Landlord share	0.60	0.50	0.70	0.77	0.75	0.80

- 1 In the SSD/MA coconut survey, missing values were implicitly defined as zeros. In this table, they do not enter into the calculation of average mandays. When contract and non-contract mandays are reported for an operation, total for it is the weighted average.
- 2 Non-1976 values were converted to 1976 figures using the implicit growth rate of credits to the coconut industry.
- 3 The average yield from 1971 to 1976 in nuts per bearing tree was taken for each region. This average was multiplied by the average number of bearing trees per hectare (147) to get the average yield in nuts per hectare.

Source: Basic Data drawn from Special Studies Division and BAECON, Ministry of Agriculture.

6.3. Shadow Pricing

Social Cost of Labor

For the shadow wage rate, we employed the Harberger method (Beardway, 1975), which is essentially a weighted average of the marginal social cost (MSC) and the marginal social benefit (MSB) of labor in copra production. If the supply of labor is relatively elastic, then most of the additional labor needed in copra production is met by an increase in supply. Thus, the weight for MSC (d) will be close to one. The rest will come from existing uses of labor.

We assumed that rural labor was homogeneous, and that its use in coconut farms was substantial. The latter assumption implies that distortions operating in the copra market indirectly distort the rural labor market. The market wage (W) was taken to be the distorted MSB of labor. Thus, the undistorted MSB was equal to $(W/(1+NPR))$, where NPR is the nominal protection rate for copra. The MSC was just equal to W. Formally, the Harberger shadow wage rate is

$$\begin{aligned} \text{SWR} &= \text{MSC} (d) + \text{MSB} (1-d), \\ &= W \left[\frac{(1+dNPR)}{(1+NPR)} \right] \end{aligned}$$

We assumed d to be 80 percent.

The total social cost of labor was determined by adjusting the cost of hired labor upwards by 54 per cent to account for the following: (a) household and operator's labor used up in production (50%) and (b) the interest on labor's wages (4%).

Social Cost of Capital

The shadow interest rate used was 15 percent. The annual rate of depreciation was calculated as the sum of one percent of the value of land and

trees and ten percent of the value of invested capital in coconut farms.

Shadow Rent

The marginal social value product of the land used in copra production is the product of its marginal product and the world price of copra. The former is approximated by the landlord's share (s) multiplied by the average yield of the land.

Roumasset and James [1979] has shown that s is an increasing function of land productivity. In cases where s was not directly observed the following approximation was used:

$$s_j = s^* + \left[\frac{(Y_j - Y^*)}{(Y^{**} - Y^*)} \right] (s^{**} - s^*)$$

where s_j is the landlord's share in region j, Y_j is the average land productivity of region j, and the superscripts * and ** indicate respectively the minimum and maximum values of the superscripted variable. Our minimum and maximum shares are .55 and .80 respectively [Roumasset, 1979]. We adjusted downward to .50 the landlord share in Mindoro to account for the higher marketing cost in this province. The adjusted landowner shares are shown in Table 11.

Operator's Opportunity Cost

The total social factor cost was adjusted upwards by 5 percent to incorporate the operator's opportunity cost in copra production.

6.4. Results

Table 12 summarizes the domestic social costs in copra production. The social rent of land was approximately 50%, the highest share of the entire social cost of producing copra. The shadow wage bill was 25% of total social

cost. The opportunity cost of capital came third, at about 12%. The combined cost of marketing, i.e., the total marketing outlay made by farmers and traders, and of other inputs, both as reported in Valiente et. al. (1979), constituted about 8% of total. The share of the operator's opportunity cost of was about 5%. Land and labor costs together constituted about three-quarters of the entire social cost. As expected, there was little variation in the total social costs across the regions.

The average return per ton of copra in 1976 was \$258.97. It is a three-year average centered at 1976. The average DRC was ₱6.05 with a standard deviation of ₱0.14. Dividing the DRC with the OER which was ₱7.44 in 1976, the average measure for comparative advantage was 0.81, roughly the protection coefficient for copra in 1976. The SER was 32% over the OER in 1976. Thus, following the conventional practice, comparative advantage averaged 0.55 for copra. That is, dividing the DRC with the SER apparently suggests a stronger comparative advantage for all the regions (0.55) than with the OER.

Table 12.
Domestic Resource Costs in Copra
Production, By Region: 1976
(per metric ton)

	Southern Luzon	Mindoro	Central Visayas	Western Visayas	Samar	Northern Mindanao
Costs (pesos)						
Labor	513.57	505.37	416.69	293.55	360.07	332.32
Rent	726.30	653.67	847.97	932.52	908.29	969.22
Interest	75.68	75.68	27.35	35.27	49.23	42.96
Depreciation	94.43	94.43	63.68	68.75	54.82	41.24
Others	6.19	2.04	7.15	3.98	7.33	6.21
Marketing	110.00	160.00	90.00	110.00	130.00	120.00
Subtotal	1526.17	1491.19	1452.84	1444.07	1509.74	1511.95
Operator's Opportunity Cost ²	76.31	74.56	72.64	72.20	75.49	75.60
Total	1602.48	1565.75	1525.48	1516.27	1585.23	1587.55
Returns (US \$) ³	258.97	258.97	258.97	258.97	258.97	258.97
DRC (pesos/US \$)	6.19	6.05	5.89	5.86	6.12	6.13
Comparative Advantage⁴						
DRC/OER	0.83	0.81	0.79	0.79	0.82	0.82
DRC/SER	0.57	0.55	0.54	0.54	0.56	0.56

- 1 The Harberger shadow wage rate is used. The figures reported here are corrected for household and operator's labor and for interest of the wages to labor (54 percent of hired labor costs).
- 2 It is estimated at 5% of subtotal cost.
- 3 Three-year average of f.o.b. copra prices centered at 1976.
- 4 Assuming a shadow exchange rate of ₱10.94 or 32 percent over the official exchange rate (= ₱7.44).

Source: Basic data drawn from the Special Studies Division, Ministry of Agriculture and United Coconut Association of the Philippines.

7. Concluding Remarks

The coconut levy and the export tax drive a wedge between border and producer prices. This wedge is apparently widened by policies which limit competition with UNICOM. To the extent that UNICOM has market power in buying copra, it is able to pay lower prices to traders who in turn pay lower prices to producers.

The unified control of copra goes hand in hand with control of oil exports. To the extent that foreign exchange earnings to the Philippines are increased, this may partly be justified. But these earnings can be obtained without monopolization. If we have some evidence that the elasticity of world demand for coconut oil is finite, the country can impose an export tax on oil equal to the reciprocal of the demand elasticity.

It is interesting to note that the government intervention in marketing followed the intervention in investment and pricing. First, the BOI investment incentives were designed to offset existing distortions due largely to an undervalued foreign exchange, that was in turn caused by a system of protective tariffs. The government believed that the investment subsidy was further justified by the backward linkages with the coconut industry. But the incentives were not tied to any reasonable specification of milling capacity. Thus, protection led to subsidies, which led to monopoly.

Another cause of unification was the price controls on edible oils sold for domestic consumption. As part of the regulation program, refiners of edible oil were given a subsidy calculated to make up the difference between the actual copra price and the price necessary to "break even" given the price controls on edible oil. Without the subsidy, refiners would reduce capacity

utilization during times of tight copra supply. With the subsidy, however, it became profitable to maintain production at optimal capacity even when copra became scarce. This led to greater increases in wholesale copra prices and correspondingly lowered the profitability of oil milling. Thus, when some of the oil mills closed down in 1979, the government intervened with the UNICOM policy. Again this illustrates how a well meaning government intervention can lead to a spiral of offsetting regulations.

The UNICOM and the AII are examples of the tendency of government to grant exclusive rights to a particular company. The government protects both companies from competition in their respective enterprises. Even the argument that these companies are quasi-public enterprises in that they serve special functions for government programs in the industry is not sufficient. It maybe appropriate here to quote Baumol's (1981) third principle for the operation of a public enterprise:

Unless an overwhelming case in terms of benefits can be made for the contrary position in a particular case, a public enterprise should not be protected from the entry of competitors. Any firm which wishes to enter into competition with a public firm should normally be permitted to do so without any special costs or obligations beyond those imposed on incumbents. Moreover, freedom of exit should be the rule, not the exception. In any event, there should always be a presumption that favors such freedom of entry and exit, with the burden of proof to be borne by those who wish to abrogate it in any particular case (p. 11).

It appears that retaining modest export taxes but removing the CCSF levy and the trade restrictions would substantially increase returns to coconut producers while still providing a subsidy to domestic consumers and revenue with which to finance important development programs in the industry, e.g., research and development. For example, a 12 percent export tax on both copra

and coconut oil would automatically produce a price for domestic use that is substantially lower than their border prices, thus eliminating the need for the subsidy program.

If domestic price stabilization is desired, then the export tax should vary with the world price. For the low world prices prevailing today, for example, the export taxes could be removed. A variable export levy would also tend to stabilize producer's incomes. It is interesting to note that the tax would lower the mean prices to both producers and consumers, i.e., it would imply a subsidy of consumers by producers. On the other hand, the average returns to producers would be much higher than under the present system. A levy on agricultural exports may also provide more balance to the overall tax system since non-agricultural producers tend to pay higher business taxes and urban consumers pay higher indirect taxes relative to their real incomes.

This policy of increasing and stabilizing producers' prices would in turn stimulate farm production. Historically, the major source of growth in coconut production has been the expansion of area planted. Already 25 percent of the cultivated area is devoted to coconuts, and we do not have evidence that further expansion of coconut plantations would be a better use of the country's land resources than other crops.

This leaves us with the option of improving the present technology at our coconut farms. However, increasing yields does not necessarily imply replanting coconut plantations with a hybrid though this cannot be ruled out. A policy to promote better farm management and to increase cultivation by intercropping beneath the trees might be more efficient.

In summary, the export tax, production levy, and marketing regulations have all combined to lower the price received by coconut producers. Producers have not been adequately compensated by the small and selective programs of scholarship and insurance nor by the replanting scheme. The consumer subsidy

of cooking oil and other coconut products is also a very small transfer compared to the tax revenue and potential marketing profits of government regulated trade. While the CCSF levy has been temporarily suspended, this has been largely offset by the recent imposition of an export ban on copra again resulting in substantial negative protection.

The real benefits to coconut consumers and producers could be financed without either the CCSF levy or the export ban. A variable export tax would be sufficient for the modest revenue needed for these programs and would provide some degree of stabilization and consumer protection as well. The export tax should not be increased, however, without corresponding reductions in industrial import tariffs which continue to impose hidden taxes on exports.

Appendix 1.
The Relationship Between The Prices of Crude Coconut Oil In New York
And Copra In Manila, 1970-1979: The "Ten Peso Rule"

Year	Price of Coconut Oil in New York (US cents/lb) (1)	Price of Copra in Manila, Gross of Export Tax and Levy (₱/100 kgs.) ¹ (2)	Ratio of Manila Copra Price to NY Price of Coconut Oil (col.3/col.2) (3)
1970	14.40	105.60	7.3
1971	12.50	97.60	7.8
1972	9.05	72.80	8.0
1973	21.30	194.40	9.1
1974	45.03	386.70	8.6
1975	17.45	156.30	9.0
1976	18.57	179.00	9.6
1977	25.92	272.20	10.52
1978	30.66	323.50	10.52
1979	43.85	438.50	10.02

1 The export tax and the CCSF levy are added to actual copra price in Manila. This series may be regarded as the copra price in the absence of the export tax and the CCSF levy or the "border price" of copra.

2 The "ten peso rule" is evident starting 1977.

Source: Basic data drawn from the United Coconut Association of the Philippines.

Appendix 2.

Estimating The Input-Output Coefficient of Copra and Coconut Meat
In Coconut Oil and Dessicated Coconut

1. Copra-Coconut Oil Coefficient
 - a. Conversion Factors
 - i) 0.63 m.t. coconut oil per m.t. copra
 - ii) 0.31 m.t. copra meal (a by-product in milling) per m.t. copra
 - b. Copra-Coconut Oil Coefficient
 - i) $1.587 \text{ m.t. copra} \times \text{Price of m.t. copra} = \text{Value of gross copra per m.t. coconut oil} = V_c$
 - ii) $1.587 \text{ m.t. copra} \times 0.31 \text{ m.t. copra meal} \times \text{Price of m.t. copra meal} = \text{Value of Copra that went into copra meal per m.t. coconut oil} = V_{cm}$
 - iii) Thus, Copra-Coconut Oil Coefficient = $(V_c - V_{cm}) / \text{Price of m.t. coconut oil}$.
2. Coconut Meat-Dessicated Coconut Coefficient
 - a. Conversion Factors
 - i) 0.222 m.t. copra per 1000 nuts
 - ii) 0.162 m.t. dessicated coconut per 1000 nuts
 - b. Coconut meat-Dessicated coconut coefficient
 - i) $\text{Price of m.t. coconut meat} = \text{Price of m.t. copra} - \text{Processing Cost of m.t. copra}$
 - ii) $\text{Processing Cost of m.t. copra} = 0.30 \times \text{Price of m.t. copra}^*$
 - iii) $0.222 \text{ m.t. copra per 1000 nuts} \times 0.70 \times \text{Price of m.t. copra} = 0.1554 \text{ m.t. coconut meat per 1000 nuts} \times \text{Price of m.t. copra} = \text{Price of m.t. coconut meat per 1000 nuts} = V_m$
 - iv) $0.162 \text{ m.t. dessicated coconut per 1000 nuts} \times \text{Price of m.t. dessicated coconut} = \text{Value of dessicated coconut per 1000 nuts} = V_{dcn}$
 - v) Thus, coconut meat-dessicated coconut coefficient = $V_m / V_{dcn} = 0.96 \times (\text{Price of m.t. copra} / \text{Price of m.t. dessicated coconut})$.

Appendix 2 Continued

3. Estimates:

Year	Copra-Coconut Oil Coefficient	Coconut Meat-Dessicated Coconut Coefficient
1970	0.78	0.47
1971	0.78	0.44
1972	0.70	0.36
1973	0.72	0.56
1974	0.65	0.59
1975	0.52	0.38
1976	0.61	0.43
1977	0.69	0.43
1978	0.70	0.42
1979	0.76	0.45
1980	0.63	0.31
1981	0.65	—

* by assumption.

— no data.

Source: Conversion factors drawn from the United Coconut Association of the Philippines.

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