

**THE IMPACT OF GOVERNMENT POLICY ON THE COMPETITIVENESS OF
SUGARCANE FARMING IN LAMPUNG PROVINCE**

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Summary

Lampung Province is Indonesia's biggest sugar-producing province outside Java. Four major sugar firms produce nearly 500,000 tons sugar annually. In 2000, the total area of smallholder sugarcane farming was 12,891 ha, whereas the large plantations covered 68,011 ha.

This study examines the impact of government policy on the revenues, costs, and profits of factory estate and TRI sugarcane farming systems in Lampung Province. Under the AFTA (ASEAN Free Trade Agreement), Indonesia has committed to phase out its protection of sugar. But opponents of liberalization have argued that sugarcane farmers cannot compete without protection. The government responded by issuing SK Menperindag No. 643/MPP/Kep/IX/2002 on 22 September 2002, which regulates the way sugar is imported into Indonesia by limiting import licenses to selected state plantations and private companies. This policy, intended to protect farmers and guarantee supplies, was supported by SK Menkeu on 324/KMK.01/2002 on July 22, 2002, which placed an import tax of Rp 700/kg on imported sugar.

Private profits for the factory system were double those for the TRI farmer system, and the factory's social profits were three times those earned by the TRI farmers. Both systems benefited from large positive net transfers. Private revenues were more than double social revenues because of the heavy protection of sugar. The private costs of tradable inputs were nearly half again as much as the social costs of those inputs because of national and local taxes and corruption in marketing. No divergences were observed in the labor and capital markets. Returns to land were included in profits because it was not possible to estimate the social opportunity costs of land.

Based on the PAM analysis of sugarcane budgets, government policy to protect sugar production greatly increased profits both the TRI farmers and the factory. But that policy caused Indonesian consumers to pay about double for their sugar. Because both systems were socially profitable, the sugar protection was unnecessary to sustain domestic sugar production in Lampung and merely transferred large excess profits to sugar producers.

Background

Lampung Province is Indonesia's biggest sugar-producing province outside Java. Four major sugar firms produce nearly 500,000 tons sugar annually.¹ In 2000, the total area of smallholder sugarcane farming was 12,891 ha, whereas the large plantations covered 68,011 ha.²

Sugarcane plantation in Lampung is located mostly in the dryland areas of northern Lampung. The most common soil type is red-yellow podzolic, which is known for its high acidity. The soil structure is mostly salty loam, which is erodable during the rainy season and very compact during the dry season.

The planting season is from September through April, and the harvesting and milling season is from April to August. The productivity (yield) of sugarcane in dryland areas declined at an annual rate of 0.83 between 1979 and 1996.³ In Lampung, the ratio of harvest to yield of sugarcane is also relatively low, between 5 and 6%.

One model of sugar farming development is a partnership between the factory (nucleus), PTPN VII unit Bunga Mayang, and the farmers (TRI=Tebu Rakyat Intensifikasi). In this system, profit-sharing is determined by an old policy, Kepmentan No. 04/SK/Mentan/Bimas/V/1992 dated 19 May 1992, which allocates 66% of sugar production to farmers and 34% to the factory. After the sugarcane enters the factory, it is analyzed to determine the trash composition (a maximum of 7% of trash is allowed) and then the factory calculates the ratio of production (RoP). In 2003, the RoP was 6.8%, whereas in 2002 it was 6.2%.

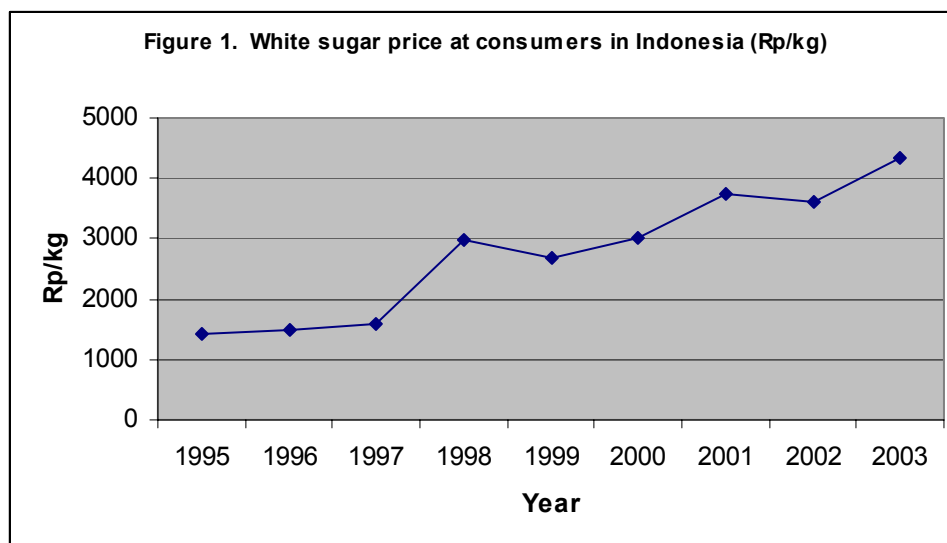
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These protectionist policies have sparked much controversy because they stimulate "cronyism" in import rights between the government, the private sector, and the state companies. Many illegal sugar imports have been confiscated recently. The smuggling of white sugar has been very lucrative, because the sugar price in Indonesia has increased during the past eight years (Figure 1).

¹ BPS, 2001. Lampung Dalam Angka. Bandar Lampung.

² BPS, 2001. Lampung Dalam Angka. Bandar Lampung

³ Sugar Statistics in Siagian, V. 1999. *Analisis Efisiensi Biaya Produksi Gula di Indonesia: Pendekatan Fungsi Biaya Multi-Input Multi-Output*. Doctorate Dissertation. Graduate School of Bogor Agricultural Institute.



Source: Perum Bulog, 2004⁴

Indonesia consumes over 3 million tons of sugar a year and domestic producers can supply about 1.7 million tons annually (Guerin, 2003). Sugar imports were 1.6 million tons in 2003 (Guerin, 2003).

Method of Analysis

The study employed the Policy Analysis Matrix (PAM) method to measure the revenues, costs, and profits of sugarcane farming systems. The PAM is illustrated in Table 1, following Monke and Pearson (1989).

Table 1. Policy Analysis Matrix (PAM)

	Revenues	Costs		Profit
		Tradable Input	Non-Tradable input	
Private Price	A	B	C	$D = A - B - C$
Social Price	E	F	G	$H = E - F - G$
Divergence	$I = A - E$	$J = B - F$	$K = C - G$	$L = I - J - K = D - H$

The study contrasts PAM results for TRI farmers and the factory estates. The PAM tables are calculated using Net Present Values (NPVs) because sugarcane is produced on a four-year cycle with four plantings called Ratun I through IV.

Assumptions

The study is based on several assumptions (Table 2).

⁴ Perum Bulog, 2004, from www.bulog.go.id

Table 2. Assumptions

Assumptions	Entities	
	TRI	Factory
Macroeconomic Assumptions		
Nominal Interest Rate (%/annum)	16	16
Social Interest Rate (%/annum)	16	16
Official Exchange Rate (Rp/\$)	8,450	8,450
Microeconomic Assumptions		
Sugar production ratio (%)	6.8%	6.8%
Sugar determinant factor	1.003	1.003
Ratio of production for molasses (%)	2.5%	2.5%
Land Rent (Rp/ha/year)	-	-
Cost for processing	34%	7.5%

Data

The study was carried out in Bunga Mayang Sub-district of North Lampung District. The research site is about 150 km north of Bandar Lampung, the capital city of Lampung Province. Sixty households were interviewed in: Sukadana Ilir (7 respondents of TRIT IV); Sukadana Udik (14 respondents of TRIT II and III); Kota Napal (8 respondents of TRIT II); Tanah Abang (27 respondents of TRIT I, II, and III); and Tulang Bawang Baru (4 households of TRIT I)

Information collected from farmers included data on input use, output yields, systems of production, and current perceptions on sugarcane farming. The information was gathered through direct interviews and from secondary data in the record book of the TRI system. Information on the estates farmed by the sugarcane factory was primary data supplied by PTPN VIII unit Bunga Mayang. The study also collected information on the proportion of production sharing, ratio of production, technology of milling, and the production costs of the Sugar Factory Bunga Mayang of PTPN VII (cane factory).

Results

Sugarcane Farming

The nucleus company used more tradable inputs than the TRI farmers did (Table 3).

Table 3. Tradable Inputs Used by TRI Sugarcane Farmers and the Factory Estates

Tradable Inputs	Initial planting		R2		R3		R4	
	TRI	Factory	TRI	Factory	TRI	Factory	TRI	Factory
a. Seedlings (ton)	9.88	10	-	-	-	-	-	-
b. Chemical Fertilizers)								
- Urea	230	300	303	400.00	310	226	313	400
- TSP/SP-36	230	-	250	400.00	298	400	259	400
- KCl	230	300	248	300.00	298	175	259	300
- Manure	-	500	-	-		-		-
- Rock Phosphate	-	1,500		-		-		-
c. Herbicides (liter)	3.59	8.50	4.15	8.47	3.61	11.43	3.15	8.50
d. Equipment (pack)	1.00	-	1.00	-	1.00	-	1.00	-
e. Bag (unit)	43.0	56.00	43.0	56.00	54.0	53.00	39.00	49.00

Note: R = ratoon or locally know as keprasan

TRI farmers also used less than three-fourths of the labor employed by the factory (Table 4). The largest gaps in labor utilization occurred during harvesting, loading and unloading, and transporting of products.

Table 4. Labor Allocation of TRI Sugarcane Farmers and the Factory Estates

No.	Activities	TRI (man days)				Factory (man days)			
		R1	R2	R3	R4	R1	R2	R3	R4
1	Land Preparation	3,6	3,98	3,15	1,41	0,33	10,00	11,67	0,33
2	Plowing and Harrowing	23,6	-	-	-	43,33	-	-	-
3	Planting	7,47	-	-	-	16,00	-	-	-
4	Pruning	-	9,38	10,93	6,65	-	2,00	2,00	2,40
5	Root Pulling (Pedot Oyot)	-	4,74	5,95	6,8	-	-	-	-
6	Fertilizer Application I	7,47	3,29	4,41	3,34	1,78	1,33	1,33	1,67
7	Land piling	4,07	5,45	5,86	4,86	-	-	-	-
8	Replanting	5,78	5,12	3,53	1,47	-	16,53	16,53	16,53
9	Fertilizer Application II	3,05	0,74	0,85	0,66	3,80	1,13	1,13	1,20
10	Manual Weeding I	14,85	7,56	14,46	7,03	12,67	14,00	12,67	12,67
11	Herbicide Application I	3,32	5,20	4,10	3,56	1,33	1,13	1,13	0,33
12	Manual Weeding II	-	-	-	-	12,67	10,67	14,00	12,67
13	Herbicide Application II	-	-	-	-	2,86	1,60	1,60	1,40
14	Leaf Peelling (Klentek) I	20,47	17,39	14,17	10,42	10,67	12,00	4,00	10,67
15	Leaf Peeling (Klentek) II	3,54	8,73	3,14	4,15	-	-	-	-
16	Harvesting-Loading-Transporting	37,05	42,35	40,73	41,05	123,48	123,26	116,47	107,42
Total		134,27	113,93	111,28	91,40	228,92	193,65	182,53	167,29

Note: R = ratoon or locally know as keprasan

The differences in labor allocation in sugarcane farming affected the levels of productivity of sugarcane (Table 5). The quantity of sugar production is determined by sugarcane production, the proportion allocated to the factory, the cost of milling, the conversion ratio of sugarcane to sugar (called *rendemen*), and the sugar determinant factor. The factory portion of sugar is 34% of the total sugarcane quantity. The cost of milling is 7.5% of the total production of sugarcane. During the field study (August-September 2003), the conversion ratio for sugar was 6.8%, the conversion ratio for molasses was 2.5%, and the sugar determinant factor was 1.003.

Table 5. Comparative Physical Outputs of Sugarcane, Sugar, and Molasses for the Factory Estates and the TRI Farmers

No.	Type of production	TRI (Ton/ha)				Factory (Ton/ha)			
		R1	R2	R3	R4	R1	R2	R3	R4
1	Sugarcane	64,18	64,61	60,06	59,17	84,19	84,04	79,4 1	73,2 4
2	Sugar	2,14	2,16	2,00	1,97	3,94	3,93	3,71	3,42
3	Molasses	1,60	1,62	1,50	1,48	2,10	2,10	1,99	1,83

Note: R = ratoon or locally know as keprasan

Profitability

Sugarcane farming was extremely profitable in private (actual market) prices (Table 6). Private profits were more than half of private revenues for both systems in all four years. The highest profitability for TRI farmers occurred in the fourth year (TRIT IV) when farmers spent less on inputs to prepare for a new production cycle. The factory system earned more than twice as much private profit as the TRI system, largely due to higher yields.

Table 6. Private Revenues, Costs, and Profits of TRI Sugarcane Farmers and the Factory Estates (Before Discounting)

No.	Description	TRI (Rp/ha)			
		R1	R2	R3	R4
1	Revenues	10,633,592.98	10,584,744.24	9,911,417.14	10,567,052.17
2	Cost	5,152,520.28	3,807,794.05	4,123,306.39	3,467,579.27
3	Profit	5.481.072,71	6.776.950,18	5.788.110,74	7.099.472,91
No.	Description	Factory (Rp/ha)			
		1	2	3	4
1	Revenues	19.213.854,60	18.957.597,70	18.046.733,54	18.030.588,52
2	Cost	6.962.973,23	6.202.828,18	5.755.453,38	5.815.109,00
3	Profit	12.250.881,37	12.754.769,51	12.291.280,17	12.215.479,52

Note: R = ratoon or locally know as keprasan

Social profitability is based on efficiency prices that reflect social opportunity costs. The social opportunity cost of sugarcane is the price of comparable sugar imports. The social prices of tradable input such as urea, SP-36, and herbicides are also based on border prices. Both sugar-producing systems were socially profitable in all four years, although the levels of social profits were much lower than of private profits (Table 7).

Table 7. Social Revenues, Costs, and Profits of TRI Sugarcane Farmers and the Factory Estates (Before Discounting)

No	Description	TRI (Rp/ha)			
		R1	R2	R3	R4
1	Revenues	10.633.592,98	10.584.744,24	9.911.417,14	10.567.052,17
2	Costs	5.920.482,57	3.540.158,85	3.816.184,79	3.190.037,67
3	Profits	4.713.110,41	7.044.585,38	6.095.232,34	7.377.014,51
FACTORY (Rp/ha)					
1	Revenues	19.213.854,60	18.957.597,70	18.046.733,54	18.030.588,52
2	Costs	7.624.818,00	5.592.180,20	5.102.845,80	5.114.556,00
3	Profits	11.589.036,60	13.365.417,50	12.943.887,74	12.916.032,52

Note: R = ratoon or locally know as keprasan

PAM Results

The NPV PAM results were based on an assumption that the private and social discount rates are identical, both 16 percent (Table 8). This procedure permitted easy identification of the impacts of policies on tradable outputs and inputs, labor and capital.

Table 8. NPV PAMs for TRI Sugarcane Farmers and the Factory Estates (Private Discount Rate = 16%, Social Discount Rate = 16%)

Farmers	Revenue	Tradable	Domestic Factors				Profit
		Inputs	Labor	Capital	Land	Total	
Private	29.218.994,03	4.879.938,46	4.844.493,06	1.352.608,52	-	6.197.101,57	18.141.954,00
Social	13.625.315,17	4.173.091,89	4.844.493,06	1.352.608,52	-	6.197.101,57	3.255.121,70
Divergences	15.593.678,86	706.846,56	-	-	-	-	14.886.832,30

Factory	Revenue	Tradable	Domestic Factors				Profit
		Inputs	Labor	Capital		Total	
Private	52.172.162,92	5.500.499,92	8.258.855,20	2.201.496,82	-	10.460.352,01	36.211.310,99

Table 8. NPV PAMs for TRI Sugarcane Farmers and the Factory Estates (Private Discount Rate = 16%, Social Discount Rate = 16%)

Farmers	Revenue	Tradable	Domestic Factors				Profit
		Inputs	Labor	Capital	Land	Total	
Social	24.506.337,90	4.690.955,43	8.258.855,20	2.201.496,82	-	10.460.352,01	9.355.030,46
Divergences	27.665.825,02	809.544,49	-	-	-	-	26.856.280,53

Private profits for the factory system were double those for the TRI farmer system, and the factory's social profits were three times those earned by the TRI farmers. Both systems benefited from large positive net transfers. Private revenues were more than double social revenues because of the heavy protection of sugar. The private costs of tradable inputs were nearly half again as much as the social costs of those inputs because of national and local taxes and corruption in marketing. No divergences were observed in the labor and capital markets. Returns to land were included in profits because it was not possible to estimate the social opportunity costs of land.

Government policy to protect sugar production greatly increased the profits of sugarcane farming for both the TRI farmers and the factory. But that policy caused Indonesian consumers to pay about double for their sugar. Because both systems were socially profitable, the sugar protection was unnecessary to sustain domestic sugar production in Lampung and merely transferred large excess profits to sugar producers.

Interpretation of PAM Results

The calculation of ratios facilitates comparison of the results of the study.

Table 9. Indicator Ratios from NPV PAMs for TRI Sugarcane Farmers and the Factory Estates

	PAM Indicator Ratios	TRI Systems	Factory Systems
	NPCO [A/E]	2,13	2,13
	NPCI [B/F]	1,17	1,26
	PCR [C/(A-B)]	0,25	0,23
	EPC [(A-B)/(E-F)]	2,57	2,54
	PC [D/H]	5,57	3,85
	SRP [L/E]	1,09	1,08

The Nominal Protection Coefficients on Output (NPCO) shows that policies to protect sugar production caused the domestic price of sugar to be more than twice the sugar import price. This huge transfer was from Indonesian consumers of sugar to Indonesian producers of sugar. This result is consistent with that found earlier by Rosegrant, *et al.* (1987), which concluded that the NPCO for sugar was then 2.1.

The Nominal Protection Coefficients on Tradable Inputs (NPCIs) were high because of taxes and corruption. Although these implicit taxes on sugar production were

at high rates, they were strongly outweighed by the considerable protection on sugar output, causing very high Effective Protection Coefficients (EPCs).

The Private Cost Ratios (PCRs) were very low (between 0.23 and 0.25), indicating the extremely high level of private profits. No conclusions can be drawn about efficiency or comparative advantage because it was not possible to estimate the social opportunity costs of land used in sugar production.

Policy Implications

Indonesian policies to restrict imports of sugar have caused domestic prices to rise to levels more than twice the levels of comparable sugar import prices. This huge difference between the Indonesian and world sugar prices has created widespread incentives for smuggling. Protection through licensing and quotas has led to charges of cronyism in allocating import licenses.

Indonesian consumers of sugar are forced to pay sugar prices that are more than twice the import levels. These transfers are unnecessary because both the factory system and the TRI farmer system in Lampung are socially profitable and thus would earn healthy profits even if the sugar protection were eliminated. The elimination of sugar protection would reduce corruption and cronyism in sugar trading and greatly reduce sugar prices paid by Indonesian consumers.

Because Indonesia is a member of the World Trade Organization (WTO) and the ASEAN Free Trade Area (AFTA), the current sugar protection policy will need to be phased out. The results of this study show that sugar production in Lampung Province can remain viable in the absence of protection. Recent levels of sugar protection are 240 percent in the European Union, 150 percent in the United States, and about 100 percent in Thailand and the Philippines (Guerin, 2003). If other countries also phase out their very high protection of sugar, the world price of sugar will rise considerably, improving Indonesian efficiency.

Under the profit-sharing arrangement between the factory and the TRI farmers (Kepmentan No. 04/SK/Mentan/Bimas/V/1992), the farmers paid 34 percent of their sugarcane production for processing while the factory was charged only 7.5 percent. That policy should be reviewed in an effort to provide more revenue for sugarcane farmers.

References

- Abidin, Z., B. Arifin, H. Ismono. 2003. Typology of Farmers: A Study on Small Holder Agroforestry Options on Depleted Soil (SAFODS). University of Lampung
- BPS. 2001. Lampung Dalam Angka. Bandar Lampung
- Guerin, Bill. 2003. Indonesia's double-whammy food crisis. *Asia Times*.
- _____. 2003. How the mighty Indonesian sugar industry fell. *Asia Times*.
- Menteri Perdagangan dan Industri Republik Indonesia. Surat Keputusan No. 643/MPP/KEP/2002 tentang Tataniaga Gula Impor. Jakarta
- Menteri Keuangan Republik Indonesia. Surat Keputusan No. 324/KMK.01/2002 tentang Perubahan Tarif Bea Masuk atas Impor Gula. Jakarta
- Monke, E.A. and S.R. Pearson. 1989. *The Policy Analysis Matrix for Agirucultural Development*. Cornell University Press. Ithaca, N.Y.
- Rosegrant, M.W., F. Kasryno, L.A. Gonzales, C.A. Rasahan and Y. Saefudin. 1987. Price and Investment Policies in the Indonesian Food Crop Sector, IFPRI, Washington D,C. and CASER, Bogor in Siagian V. 1999. *Analisis Efisiensi Biaya Produksi Gula di Indonesia: Pendekatan Fungsi Biaya Multi-Input Multi-Output*. Doctorate Dessertation. Graduate School of Bogor Agricultural Institute.
- Siagian, V. 1999. *Analisis Efisiensi Biaya Produksi Gula di Indonesia: Pendekatan Fungsi Biaya Multi-Input Multi-Output*. Doctorate Dessertation. Graduate School of Bogor Agricultural Institute.