

POLICY BRIEF NO. 3

RICE TARIFF ALTERNATIVES

**BAPPENAS/USAID/DAI FOOD POLICY ADVISORY TEAM
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The classical dilemma of balancing producer and consumer interests has rarely been this dramatic, anywhere. The fact it is happening at a time when Indonesia, with an emerging open society and new government, has an opportunity to significantly improve the welfare of both groups with the appropriate decision on trade policy (the rice tariff) underlines the importance of the upcoming decision. The opportunity will not last for the long-term as world rice prices (as low as \$200/ton for Quality 3 rice) will most likely begin to move toward trend world prices of about \$250/ton.

It is important to remember that surplus rice farmers represent only 20% of Indonesia's population, less than half of the rural population and earn only about one-quarter of their incomes from rice. Also, the SUSENAS data show that rice makes up about 30% of the bundle of goods that persons in the lowest income quintile purchase.

The attached chart indicates current rice prices in Indonesia are 25% above world prices, largely due to Bulog's monopoly import position. The chart assumes the GOI will announce free imports as part of the package of new trade policy for rice, whatever the tariff level.

At a 10% tariff (with free imports) the domestic price will decrease 15% (2nd column, 2nd row), the change in rice farmer profit from the pre-crisis peak (1996) remains a very healthy 41%, while 10 million of Indonesia's poorest will move above the poverty line. There is no other policy instrument or government program, which could produce such dramatic results at virtually no cost to the public budget (in fact gains from tariff revenues, assuming they are collected).

A reinforcing reason to keep this tariff modest is that Indonesia, in concert with fellow ASEAN members, has agreed to a zero tariff regime for rice by the year 2010. Keeping border prices more in line with projected longer-term world trend prices, will make such adjustments easier.

IMPACT:
Alternative Rice Tariffs

	Tariffs rates:			
	<u>Zero</u>	<u>10%</u>	<u>25%*</u>	<u>40%</u>
<i>Retail rice prices:</i> % change at different tariffs (Jakarta retail, base Dec. 1998)	-25%	-15%	0	+15%
<i>Rice Farmer Profits:</i> % change from 1996, pre-crisis peak	+19.4%	+41%	+73.5%	+105.9%
<i>Movement above Poverty Line:</i> <u>Million</u> of people moving up from poverty (Base: Dec. 1998, 46.1 million in poverty)	+14	+10	+4	-2
<i>Income Change due to Reduced:</i> <i>Rice Prices:</i> Multiplier effect in Rupiah per capita per year	9,700	14,900	0	-14,900

* Current effective rate due to ban on lower quality rice imports effective September 2, 1999

Notes:

Except for the poverty numbers, which are from SUSENAS, data shown here are explained in detail in the accompanying table and discussion of assumptions. The poverty numbers are calculated from a table prepared by the Harvard International Institute for Development project based in the Ministry of Finance.

For comparison of the significance of rice to the poor, a 100 percent increase in the price of kerosene would increase the number of individuals below the poverty line by 2.4 million. A 40 percent decrease in the price of rice (returning rice prices to roughly the same level in real terms as before the financial crisis) would raise 16.2 million individuals above the poverty line.

Impact of Various Rice Tariffs on Producer and Consumer Welfare, by Quintile.

	Income Quintiles, from poorest to richest					
	I	II	III	IV	V	Avg,
Share of Income	0.06	0.12	0.16	0.22	0.44	
Per Capita Income, US \$	225	450	600	825	1,650	750
Per Capita Income, 000 Rp	1,525	3,150	4,200	5,775	11,550	5,250
Per Capita Expenditures, 000 Rp	945	1,890	2,520	3,465	6,930	3,150
Rice Consumption						
-- kg / year	135	157.5	165	157.5	135	150
(share, %)	18	21	22	21	18	
-- kg, Rp/kg	2,000	2,250	2,500	2,750	3,000	2,500
-- Expenditure, 000 Rp	270	354.4	412.5	433.1	405	375
Rice Expenditure as a Share of :						
-- Per Capita Income (PCY)	17.1	11.3	9.8	7.5	3.5	7.1
-- Per Capita Expenditures (PCE)	28.6	18.8	16.4	12.5	5.8	11.9
Total Rice Consumed, MMT	5.4	6.3	6.6	6.3	5.4	30.0
Share of Rice Purchased, %	100	33	-227	33	100	
Amount of Rice Purchased, MMT	5.4	2.1	-15.0	2.1	5.4	
Rice Area Harvested, Million ha	0	1.4	7.2	1.4	0	10.0
Rice Produced, MMT	0	4.2	21.6	4.2	0	30.0
Rice Income, Trillion Rp (12/99)	0	6.72	34.56	6.72	0	48.0
Per Capita Rice Income, 000 Rp	0	168	864	168	0	
--as a share of total income	0	5.3	20.6	2.9	0	4.6
Net Income Change at Various Tariffs on Rice Imports (000 Rp/cap)						
0 % Tariff (-25% price change)				Total gain or loss		
Consumer gain	67.5	88.6	103.1	108.3	101.3	
Minus farmer loss	0	52.5	270	52.5	0	
Minus trader loss	0	2.0	8.0	30.0	53.8	
Equals net gain or loss	67.5	34.1	-174.9	25.8	47.5	0
10% Tariff (-15% price change)						
Consumer gain	40.5	53.2	61.9	65.0	60.8	
Minus farmer loss	0	31.5	162.0	31.5	0	
Minus trader loss	0	1.0	5.0	18.0	32.4	
Equals net gain or loss	40.5	20.7	-105.1	15.5	28.4	0
25% Tariff (0% price change)						
No change	0	0	0	0	0	0
40% Tariff (+15% price change)						
Consumer gain	40.5	53.2	61.9	65.0	60.8	
Minus farmer loss	0	31.5	162.0	31.5	0	
Minus trader loss	0	1.0	5.0	18.0	32.4	
Equals net gain or loss	-40.5	-20.7	105.1	-15.5	-28.4	0
Multiplier Impact from Net Income Change, by Tariff Level (000 Rp/capita)						
(Expenditure Multiplier)	1.8	1.6	1.4	1.2	2.0	
0% tariff	135.0	61.4	-279.8	36.1	57.0	9.7
10% tariff	90.0	37.3	-168.2	21.7	34.1	14.9
25% tariff	0	0	0	0	0	0
40% tariff	-90.0	-37.3	168.2	-21.7	-34.1	14.9

Assumptions for table

1. Income quintiles each contain 20 percent of the population, or 40 million individuals if total population is rounded to 200 million. The first quintile is made up mostly of rural landless and urban poor households, the second quintile is rice-deficit farmers and urban near-poor, the third quintile is surplus rice farmers, the fourth quintile is the rural wealthy and urban workers, and the fifth quintile is upper income urban households. Obviously, there is some blurring of occupations and rural-urban location across all the quintiles, but this categorization is useful to have some sense of the "representative agent" in each quintile.
2. Share of income accruing to each quintile is taken from recent SUSENAS reports, with the share of the bottom quintile reduced to 0.06 from its pre-crisis level of about 0.08.
3. Per capita incomes in late 1999 are assumed to be \$750, which is Rp5.25 million at an exchange rate of Rp7,000 per USD, the mid-point of the range assumed for the budget Per capita expenditures are assumed to be 60 percent of per capita income, to be consistent with SUSENAS-based poverty lines.
4. Rice consumption is 150 kg per capita per year (taken from representative food balance sheet data), implying a total consumption of 30 million metric tons (mmt). These are "round numbers" used for convenience. The distribution of rice consumption by quintile follows SUSENAS results, with the bottom 20 percent of the income distribution consuming 18 percent of total rice consumed, the next quintile consuming 21 percent, and so on.
5. The average price of rice for purchase at retail is Rp2,500 per kg, but the poor pay only Rp2,000 per kg while the rich pay Rp3,000 per kg. Total expenditures on rice are obtained by multiplying the per capita consumption times the retail price. Rice expenditures as a share of per capita income range from 28.6 percent for the poorest quintile to just 3.5 percent in the highest quintile, with the national average being 7.1 percent.
6. Both the top and bottom quintiles are assumed to purchase 100 percent of their rice, the second and fourth quintiles are assumed to purchase one third of their rice from the market, and the third quintile of rice surplus farmers thus supplies all the rice needed to balance the rice market. Accordingly, the rice surplus is 15 mmt supplied from the third quintile, which balances the total market demand from the other four quintiles. Thus the "marketed surplus" is 50 percent, in line with estimates from the field.
7. Total rice area harvested is assumed to be 10 million hectares, with an average yield of milled rice of 3 metric tons (mt), so total production equals 30 mmt, the same as total consumption. Rice imports can be added to this model by building *in* losses for waste and seed use from domestic production, or by adding a separate consumption category. The basic results *in* terms of distributional impact of changes in the rice tariff are not affected either way.
8. Rice income is calculated from representative farm data reported by BPS. At the price structure used as the base in this model (December, 1999), each hectare of rice harvested generates Rp. 4.8 million in farm income. Rice acreage is distributed across quintiles two, three, and four *in* such a way that a representative farm household in quintiles two and four has access to 0.175 ha of non-irrigated rice land (with a single crop of rice each year), whereas the typical rice-surplus household in quintile three has access to 0.45 ha of irrigated rice land (which is double-cropped with rice). The resulting levels of rice

production and rice-based income are shown in the table for each relevant quintile. Even in quintile three, which contains the rice surplus households, rice income is only 20.6 percent of total household income. For the economy as a whole, rice-based farm *income* is only 4.6 percent of total income (which is consistent with the macro-level data that value-added from rice farming is less than five percent of total GDP). Rice based farm income is a function of rice prices received by farmers according to spread sheet calculations based on the BPS farm model (attached).

9. Net income change as a function of level of rice tariff is calculated assuming that rice production and consumption do not change in the short run. Since the elasticities of supply and demand are quite small *in* the short run, this simplifies the calculations without being seriously misleading. Thus a 25 percent decrease in the rice price, roughly the expectation if the import duty were zero and there was complete free trade in rice, would lower rice expenditures for consumers by 25 percent. The same decrease in rice price would drop income for rice farmers from Rp. 4.8 billion per hectare to Rp. 3.3 billion. Traders are also assumed to face losses if the profitability of rice farming drops, so that total gains to consumers of the price decrease are exactly matched by losses to rice farmers and traders. Thus no "efficiency gains" are included in these calculations to reflect the benefits from although individual quintiles have large gains and losses when rice prices change, the net direct gain or loss for society as a whole is always zero.
10. An argument is made, however, that increases or decreases in incomes also have multiplier effects, and these vary by income class. Additional income in the hands of the poor has more impact than spending by the rich because the poor tend to consume more goods with a high "labor content," and also because their consumption bundle is less import-intensive. An expenditure multiplier of 2.0 is assumed for income changes in the lowest quintile. The multiplier declines smoothly by income class, until it is just 1.2 in the top quintile. Adding up the net multiplier impact by income class to a total for the economy produces the results in the right hand column of the table. The totals are small in relation to the entire economy (less than one percent of per capita income), but reach their maximum benefit when the rice tariff is set at 10 percent. A tariff that raises prices above their current levels will reduce social welfare, according to these calculations.

	1996 Data from BPS			1999 Data (25% protection)			1999 Data (10 % protection)		
	Quantities	Prices	Values	Quantities	Prices	Values	Quantities	Prices	Values
Output	4,424	439	1,942,136	4,296	1,400	6,014,400	4,296	1,190	5,112,240
Inputs									
Seed			28,035			56,827			56,827
Pesticide			18,718			63,342			63,342
Fertilizer									
Urea	170	376	63,920	181	1,045	189,145	181	1,045	189,145
TSP	81	492	39,852	77	1,708	131,516	77	1,708	131,516
Other			9,552			19,362			19,362
Misc			109,402			221,758			221,758
Labor			301,689			511,966			511,966
Return to Family Labor, Land, and Management			1,370,968			4,820,484			3,918,324
Nominal Percentage Increase						252			186
Real Percentage Increase						73			41

	1999 Data (0 % protection)			1999 Data (40 % protection)		
	Quantities	Prices	Values	Quantities	Prices	Values
Output	4,296	1,050	4,510,800	4,296	1,610	6,916,560
Inputs						
Seed			56,827			56,827
Pesticide			63,342			63,342
Fertilizer						
Urea	181	1,045	189,145	181	1,045	189,145
TSP	77	1,708	131,516	77	1,708	131,516
Other			19,362			19,362
Misc			221,758			221,758
Labor			511,966			511,966
Return to Family Labor, Land, and Management			3,316,884			5,722,644
Nominal Percentage Increase			141.937376			317.416307
Real Percentage Increase			19.357363			105.928124

Rice Price Relationship between Jakarta wholesale price for rice (in USD, US \$/mt minus \$10/mt) and Thai rice CIF (FOB Bangkok plus \$40/mt)

