THE EFFECT OF THE RICE TARIFF POLICY IN MINAHASA REGENCY

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Summary

As the staple food in Indonesia, rice is important in the lives of both rice producers and consumers. Effective January 2000, the government imposed a rice tariff of Rp 430/kg, about 30 percent, to assist rice producers. The rationale for the protection policy was to increase rice farmers' income and to improve national food security.

The PAM methodology was used to compute private and social profits to rice production, as well as the impact of government policy. The computations showed that private profits were positive for all three farming systems, thanks largely to the effect of the government's import duty. Social profits were negative when land was included as a cost because the profits of the next best alternative, peanuts, were greater than rice. Minahasa Regency clearly has a comparative advantage in producing peanuts and the current policy-induced incentives to grow rice are distorting resources away from their most efficient use.

Although the production of peanuts is socially more profitable than rice production, farmers prefer to plant rice because of household security concerns, lower perceived risk, and easier marketing arrangements. Farming interests (and some politicians) want to increase rice prices even more to transfer incomes to rice surplus households. But the downside of rice protection is that it harms poor consumers, worsens poverty, reduces human nutrition, raises labor costs, and wastes scarce resources.

1. Introduction

As the staple food in Indonesia, rice plays important roles for rice producers and consumers. Effective January 2000, the government imposed a rice tariff of Rp 430/kg, about 30 percent, to assist rice producers. The rationale for the protection policy was to increase rice farmers' income and to improve national food security.

The productivity of rice farming is influenced by the degree of irrigation, altitude, topography, geography, social economy, soil, land size, technology, and farmer status. This research focuses on semi-technical irrigation and the difference of rice farm sizes to evaluate the rice tariff policy. The objective of the study is to examine the impact of the rice tariff on rice farming in Minahasa Regency according to farm size – small (<0.5 ha), medium (0.5-1 ha), and large (>0.1 ha).

2. Research Method

2.1. Methodology

The Policy Analysis Matrix is used to evaluate the effect of the rice tariff policy on rice farming systems. This method has been used widely to analyze the transfer effects of price policy on agricultural commodities.

2.2. Sampling Method

The sampling method was multi-stage and purposive. In the first stage, the production of rice in Minahasa Regency with semi-technical irrigation was divided into northern, middle, and southern locations. In the second stage, the kecamatans with the most rice production were selected in each location. In the third stage, the villages that had the highest levels of rice production within each selected kecamatan were identified. Purposive sampling was used within each category of land size (<0.5, 0.5-1.0 and >1.0 ha). In 2001, two-thirds of the rice area in Minahasa Regency was under semi-technical irrigation. The sampling method and number of respondents are shown in Table 1.

Table 1. Sample kecamatans, villages and numbers of respondents

Minahasa Regency	Kecamatan	Village	Land Size	Respondents
Northern	Dimembe	Talawaan	< 0.5 ha; 0.5-1 ha;>1 ha	9
Middle	Toulimambot	Koya	< 0.5 ha; 0.5-1 ha;>1 ha	9
				18
Southern	Tombatu	Tombatu	< 0.5 ha; 0.5-1 ha;>1 ha	
	Tompaso			18
	Baru	Tumani	< 0.5 ha; 0.5-1 ha;>1 ha	
Total	4	4		54

Data were collected between November 2002 and January 2003. Primary data were collected through in-depth interviews with farmers, and secondary data were obtained from published records and unpublished government documents

2.3. Empirical Information

Five types of information were collected: (i) physical input-output data; (ii) private prices of inputs and outputs; (iii) social prices of nontradable inputs and outputs; (iv) export and import parity prices of tradable inputs and outputs; and (v) policies regulating rice.

2.4. Assumptions

- Market and world prices were averages of prices in October-December 2002.
- The exchange rate was Rp9000 per US$ in October 2002.
- The tariff on rice was 30 %.
- The conversion factor from dry paddy (GKG) to rice was 65%.
- The conversion factor from wet paddy (GKP) to GKG was 85 %.

3. Research Results and Analysis

3.1. Description of Research Sites in Minahasa Regency

3.1.1. Geographical Condition, Topography, and Climate

Minahasa Regency in North Sulawesi Province has a total area of 4,168 square km and consists of 30 kecamatans and 457 villages. The regency is located at 0 30 – 1 0 North Latitude and 125 – 127 East Longitude. The altitude of Minahasa Regency varies between 0 – 1,500 m, and about 40 percent of the land is at least 500 m above sea level. Temperature varies between 20-30 C, humidity ranges from 53 – 98 percent, and rainfall is between 85 mm/month – 560 mm/month.

3.1.2. Population, Labor Force, and Land

In 2001, the population of the regency was 778,739. Over half worked in the agricultural sector. Most farmers planted between 0.25 and 1.25 hectares.

3.1.3. Rice Production and Consumption

The average production and consumption of rice in Minahasa Regency between 1977 and 2001 follows:

- Area harvested 27.8 ha
- Yield 51 qw/hectare
- Production 96.9 ton
- Consumption 103.5 ton

Average rice consumption in 2001 was estimated at 106 tons or 136/kg/capita/year. Nearly a third of total rice consumed was imported. The main centers of rice development in Minahasa Regency are located in Kecamatans Tompaso Baru, Tombatu, Langowan, Kakas, Tondano, and Dimembe. The contributions to total farm household income in 1996 in

Talawaan Atas Irrigation Scheme were 32 percent from rice farming, 44 percent from fishponds, 3 percent from soybean farming, and 21 percent from non-agriculture.

3.1.4. Rice Price

The rice price in Minahasa Regency is influenced by the tariff on rice and the variety of rice. The prices of local varieties are somewhat higher than the import prices because of taste and quality. The average prices of rice at Tondano market 1997-2001 (Rp/kg) were: KS/Local, 2,346; selected rice, 2,239; and Dolog rice, 1,821 (Minahasa in Figures, 2001).

3.2. The Policy Analysis Matrix

3.2.1. Physical Input-Output (I-O)

The physical input-output coefficients for paddy production in the semi-technical irrigation system during the wet season are shown in Appendix Table 1.

a. Fertilizers and chemicals

The kinds of fertilizers applied by farmers are urea and TSP. Farmers apply less than the national recommendations for fertilizer – urea 250 kg/ha and TSP 150 kg/ha. The actual applications as a percentage of these recommendations, differentiated by land size, were: < 0.5 ha (urea 52%, TSP 43%); >0.5-1 ha (urea 65%, TSP 39%); and >1 ha (urea 78%, TSP 43%).

b. Pesticide

Farmers used pesticide in both dry and wet seasons. The amount of pesticide was the same in both seasons, although the pest population increases in the dry season. Few farmers controlled pests by applying Integrated Pest Management (IPM) principles.

c. Seed

Farmers use seed without label and exceed the recommended levels, probably because the farmers did not know well the quality or growing capacity of seed.

d. Labor

Labor in rice field activities consists of men, women and oxen, both family and hired labor. Most farmers used oxen in cultivation activities, particularly for the land size > 0.5 ha. Farmers also used oxen for transportation in the harvesting season.

e. Capital

Farmers used a few capital inputs including plows, sprayers, threshers, and rented hullers.

f. Land and Cropping Pattern

The cropping pattern of rice with the semi-technical system of irrigation is paddy – paddy – paddy. This cropping pattern increased the risk of diseases and pest attack. Therefore, farmers often did not grow rice if they had no opportunity to buy pesticide.

Pesticides were important in controlling pests, whereas fungicides were used to control diseases.

g. Output

The average yield of dry paddy in Minahasa Regency was 5.1 kg/ha, and the range of yields was 3.0 – 6.4 (Annual Report of Agricultural Service, Minahasa Regency, 2001). Other research reports dry paddy yields between 4.4 kg/ha (3.9 – 5.5 kg) (Kolinug, 1994; Rumengan, 2000; Sendow, 2000; Susanto, 2000; and Walangitan 2000). Therefore, the yield reported in Appendix Table 1 lies in the range of experience of rice productivity in Minahasa Regency. According to Taslim and Fagi (1988), the potential productivity of paddy land with technical irrigation is 5-8 ton/ha of dry paddy.

3.2.2. Private Prices

The private prices of inputs and outputs at the farm gate are shown in Appendix Table 2.

a. Fertilizer, Pesticides, and Chemicals

The average price of urea was Rp 1,500/kg and of TSP was Rp 2,800/kg. The pesticide price was Rp 150,000/unit for Akodan, and the hormone price was Rp 200,000/unit for Decamon. The prices of fertilizer in Manado central province were Urea Rp 1,300/kg and TSP Rp 2,500/kg, so the price at farm gate increased about 12 – 15 percent as a marketing margin.

b. Seed

The price of rice seed was more than that of rice, because farmers prepared seed with a special treatment. Although the productivity of local seed was lower than that of labeled seed, many farmers chose to use local seed because the price of local rice was higher than that of rice produced with the recommended seed. Government provided a subsidy of Rp 400/kg for labeled seed. The local seed varieties were called Pilihan (PL) and Superwin (SW).

c. Labor

The wage rate for male labor was Rp 30,000/day (including meal) and that for female labor was Rp 25,000/day (including meal). The fee for rental of oxen was Rp 50,000/day (including meal). The oxen fee included an operator and a plow. The cost of harvesting was determined by negotiation between the land owner and the laborers. The average ratio was 5:1 in favor of the land owner. Based on this ratio, the cost of harvesting per ton of wet paddy (GKP) was 167 kg or Rp 245,323/ton (167 kg times the price of GKP of Rp 1,469/kg).

d. Capital

The private interest rate, based on informal institutions (social groups established by the farmers), ranged between 5-15 percent/month and was 10 percent on average. Some farmers self-financed their working capital. Therefore, the blended working capital interest rate was determined at 6 percent.

e. Land

The land rental rate varied between Rp 2-3 million per year according to land productivity.

f. Output

The average price reported in Appendix Table 2 differs among the land sizes. The farmers usually sell their paddy during harvest time or a month after harvest.

3.2.3. Private Budget

The revenues, costs, and profits for the private budgets for each land size are shown in Appendix Table 3.

a. Revenue

Revenues increased slightly according to land size, although the differences are not very significant.

b. Cost

The costs (**percentage**) by farm size are summarized in Table 2 below. The high labor costs reflect large labor inputs and high wages.

Table 2. Costs by Farm Size

		Farm size	
Input Factor	< 0.5 ha	0.5-1 ha	> 1 ha
Input tradable	11,79	11,55	12,68
Labor	63,14	62,68	61,53
Capital	3,37	3,30	3,64
Land	21,70	22,47	22,15

c. Profit

Profit as a share of revenue, including land rents and excluding land rents, varied little across the three farm size categories.

Table 3. Profit as a Share of Revenue

Land size (ha)	Including Land (%)	Excluding Land (%)
< 0.5	23.45	40.06
0.5 – 1.0	26.84	43.29
> 1.0	26.15	42.60
Average	25.48	41.98

3.2.4. Social Price

The social prices for inputs and outputs are shown in Appendix Table 4.

a. Fertilizer, Pesticide and Chemicals

Indonesia is a net importer of TSP and a net exporter of urea fertilizer. Therefore, the social prices of TSP (and rice) are based on import parity prices, whereas the social price of urea is based on the export parity price, as shown in Appendix Tables 8, 9 and 10. The social prices of pesticide, growing hormone, and garden tools rental are assumed to be the same as the private prices.

b. Seed

The social price of labeled seeds was lower than the private price, because government subsidized labeled seeds by Rp 400/kg.

c. Labor

The social price of labor is well approximated by the private wage rate, because neither policy distortions nor market failures were observed in the rural labor market.

d. Capital

The social interest rate is assumed to be about 15 percent annually or 5 percent per 4 months. This assumption is based on the historical experience of other Southeast Asian countries when they were at levels of development similar to that of Indonesia today.

e. Land

The social opportunity cost of land, Rp 2,062,250 per hectare, was approximated by calculating the social profit (excluding land rent) of the best alternative crop, peanuts. Growing peanuts also was more privately profitable than producing rice, but many farmers preferred to plant rice. Several reasons were given for this behavior – household food security, rice production being less risky than peanut production, and higher costs in marketing peanuts relative to marketing rice.

f. Output

The world price of paddy at the farm gate, based on import parity price October-December 2002, was Rp 1,245/kg (Appendix Table).

3.2.5. Social Budget

The social revenues, costs, and profits for each land size are shown in Appendix Table 5. When the social opportunity cost of land is included, social profits are negative. The production of peanuts is more efficient than rice production.

Table 4. Social Profits of Rice

Land size (ha)	Including Land (%)	Excluding Land (%)
< 0.5	-16.15	23.01
0.5 – 1.0	-12.54	26.56
> 1.0	-20.90	26.04
Average	-16.53	25.20

3.2. Paddy PAMs

Table 5 a. Wet Season Paddy PAM – Semi-Technical Irrigation System Land size < 0.5 ha (Rp. 000/ha)

Item	Tradable		Domestic Factors				
	Output	Inputs	Labor	Capital	Land	Profits*	Profits **
Private	7.259	655	3.508	187	1.206	2.908	1.702
Social	5.266	539	3.508	158	2.062	1.060	-1.002
Divergence	1.993	116	0	29	-856	1.848	2.704

*)Returns to land and management **) Returns to management (excluding land costs)

Table 5 b. Wet Season Paddy PAM – Semi-Technical Irrigation System Land size 0.5 – 1 ha (Rp. 000/ha)

Item	Tradable		Domestic Factors				
	Output	Inputs	Labor	Capital	Land	Profits*	Profits**
Private	7.339	620	3.364	177	1.206	3.178	1.971
Social	5.272	503	3.364	149	2.062	1.255	-807
Divergence	2.067	117	0	28	-856	1.922	2.778

*)Returns to land and management **) Returns to management (excluding land costs

Table 5 c. Wet Season Paddy PAM – Semi-Technical Irrigation System Land size > 1 ha (Rp. 000/ha)

Item	Tradable		Domestic Factors				
	Output	Inputs	Labor	Capital	Land	Profits*	Profits**
Private	7.381	690	3.349	198	1.206	3.144	1.938
Social	5.296	565	3.349	166	2.062	1.216	-846
Divergence	2.085	126	0	32	-856	1.928	2.784

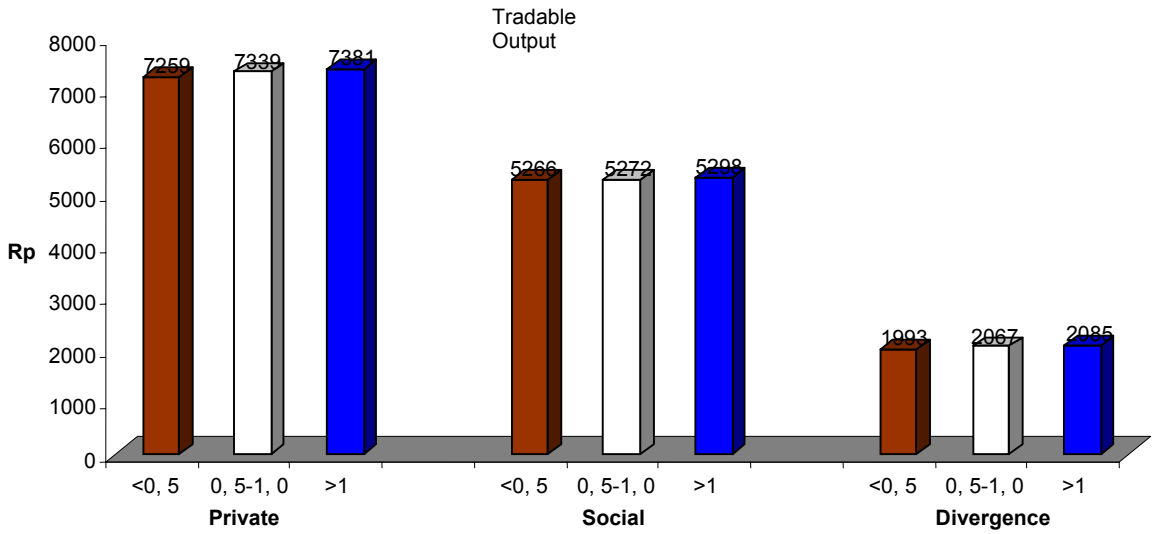
Table 5 c. Wet Season Paddy PAM – Semi-Technical Irrigation System
Land size > 1 ha (Rp. 000/ha)

Item	Tradable		Domestic Factors			Profits*	Profits**
	Output	Inputs	Labor	Capital	Land		

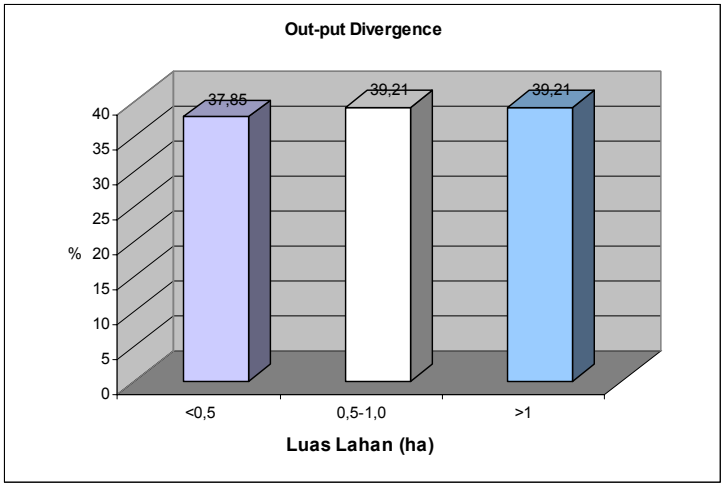
*)Returns to land and management **) Returns to management (excluding land costs)

3.2.1. Tradable Output

The tradable output divergences for each of the three rice farming systems are shown in the following graph, based on the Tables 7.1a-1c.

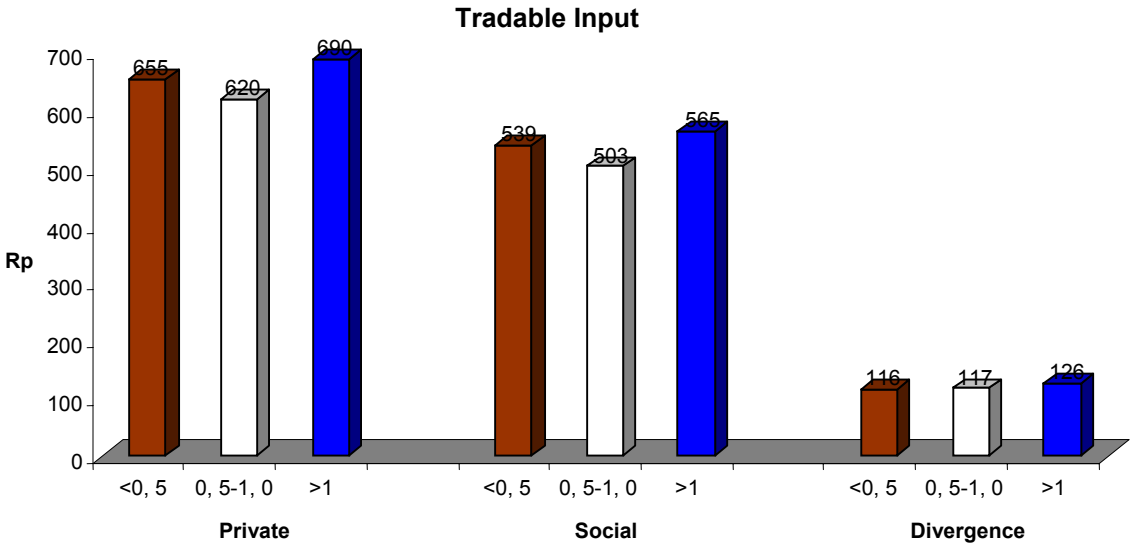


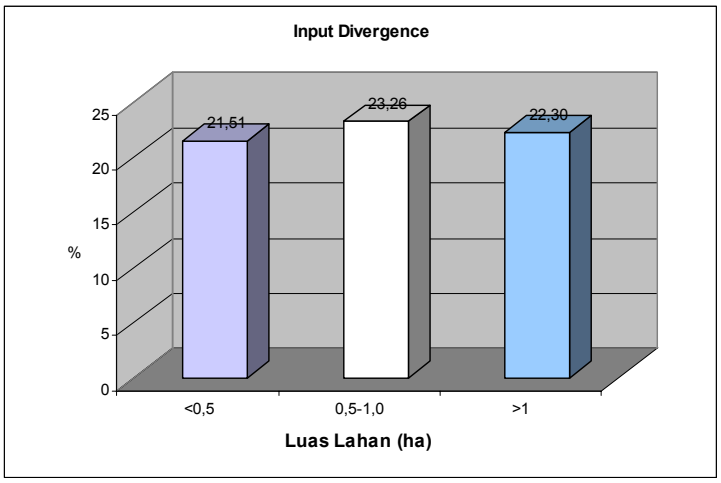
The average output divergence is 39 percent of the comparable rice import price. The tariff on rice of Rp 430/kg resulted in about 30 percent protection. The remaining 9 percent output divergence is probably explained by a risk premium that rice importers faced following the Asian financial crisis. Traders were forced to pay higher banking charges, and they faced additional risks of exchange rate and policy change. The output divergences for the three farming systems are diagrammed as percentages in the graph below.



3.2.2. Tradable Inputs

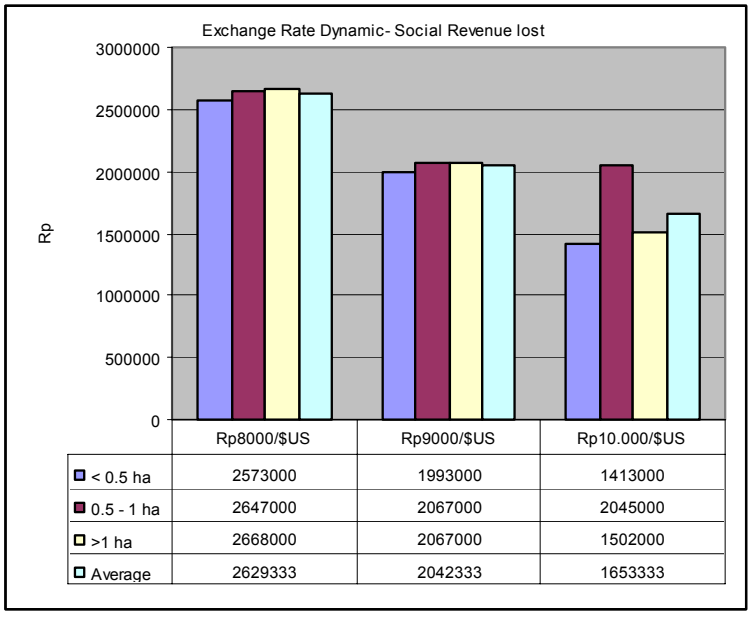
The private costs of tradable inputs were about 22 percent higher than the social costs of those inputs, so the divergence was positive. The cause of this divergence was local taxes on tradable inputs and fertilizer shortages. Retail ceiling prices for fertilizers were not enforceable. The private and social costs of tradable inputs and the resulting tradable input divergences for all three systems are shown in the following two graphs.



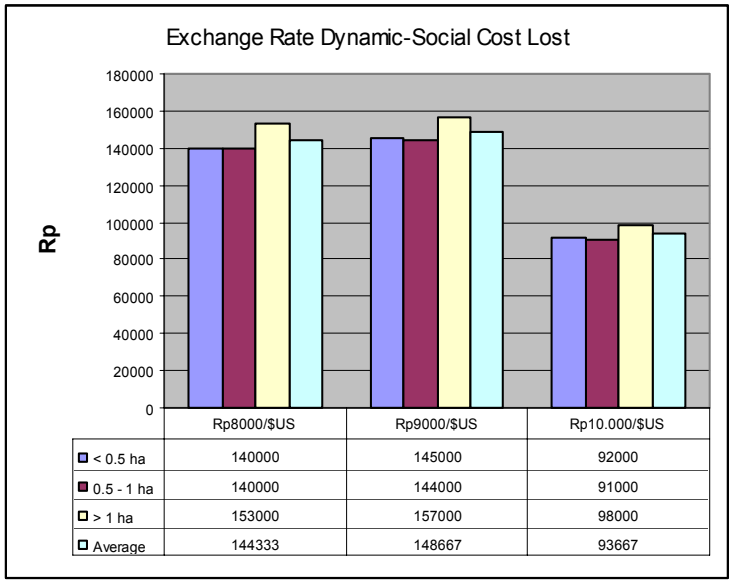


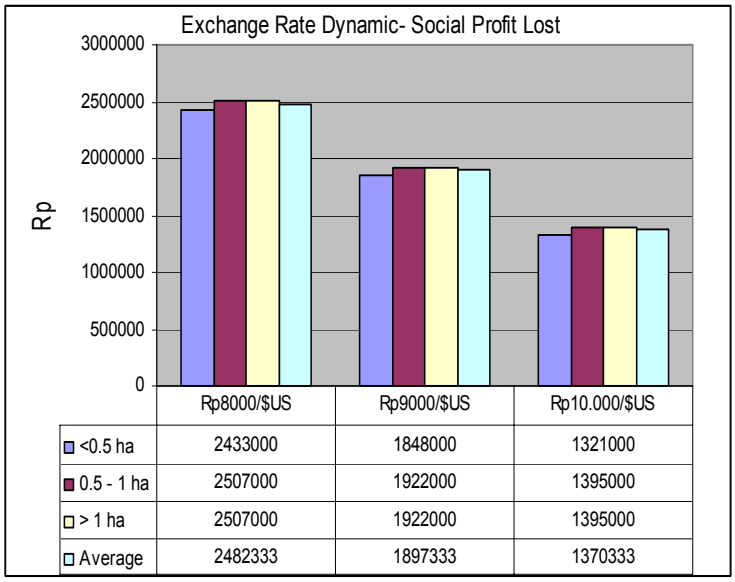
3.2.3. Sensitivity Analysis

To test the sensitivity of the results to alternative assumptions about the exchange rate, three such assumptions were made. In the base case, the exchange rate was assumed to be Rp 9,000/US$1. The sensitivity analysis tested the effect on social profits of using two alternative exchange rate assumptions – a more heavily depreciated exchange rate of Rp 10,000/US$1 and an appreciated exchange rate of Rp 8,000/US$1. The results are strongly sensitive to the choice of exchange rate. Social profits increase a great deal with the depreciated exchange rate, whereas they fall proportionately with the appreciated exchange rate. The results for the three rice systems are shown in the following three graphs.



	Rp8000/$US	Rp9000/$US	Rp10.000/$US
< 0.5 ha	2573000	1993000	1413000
0.5 - 1 ha	2647000	2067000	2045000
>1 ha	2668000	2067000	1502000
Average	2629333	2042333	1653333





3.2.4. Break Even Analysis

The three rice-farming systems in Minahasa Regency would break even, i.e., earn zero private profits, at the dry paddy prices (RP/kg) shown in the following tabulation.

Item	< 0.5 ha	0.5 -1 ha	>1 ha
Including Land	1,314	1,268	1,281
Excluding land	1,029	983	996

The actual rice prices received by farmers (land size <0.5 ha, Rp 1,716; 0.5-1 ha, Rp 1,733; and > 1 ha, Rp 1,735), reflecting the rice tariff and importer risk premiums, were far above the above the break-even points and demonstrated high private profits. The world rice price during October-December 2002, Rp 1,245/kg, was lower than the break even prices including land costs but higher than those prices excluding land costs

4. Implications

4.1. National Interest Groups

None of the three rice-farming systems in Minahasa Regency would be privately profitable without protection. If the output divergences were to be reduced to zero, the private profits for all systems would be negative. These inefficient systems remain in business because of the rice tariff. However, the tariff on rice, a staple food, hurts poor consumers, causes poverty, harms human nutrition, raises labor costs, and wastes resources. Nevertheless, the rice producers remain poor because the farmers need to diversify into higher income activities, on- and off-farm. The tariffs protecting agriculture are popular only because they are politically expedient (both in poor and rich countries).

4.2. International Ramifications of Results

Some rice farmers in Minahasa Regency might continue to produce rice to guarantee household food security. But many would shift to more profitable activities if the protection of rice were to be reduced in the future. Indonesia is a founding member of ASEAN and an active signatory of the AFTA agreement within ASEAN to create a free trade area in Southeast Asia. If Indonesia were to have to reduce its protection on rice substantially, much of the rice production in Minahasa would become privately unprofitable. All of the systems are socially unprofitable, because peanuts can be grown more efficiently.

5. Conclusions and Recommendations

1. Rice production in Minahasa Regency is privately profitable in all three systems, distinguished by land size. There is not much difference in the private profits of the three systems, except that the smallest farms have somewhat lower private profits. Although private profits are positive, rice-farming households remain poor because they have very small land sizes. These households need to diversify into higher income activities, on- and off-farm.

2. The rice tariff and the trader risk premium strongly protected the rice-farming systems in all farm sizes. The average output divergence was 39 percent of which about 30 percent was due to the tariff policy. Without this protection, private profits would be negative.

3. The rice tariff policy caused a waste of resources by encouraging farmers to continue to produce rice. Rice production is inefficient, because social profits are negative. The production of peanuts is much more socially profitable than is rice production. However, farmers prefer to plant rice because of household food security concerns, lower perceived risk, and easier marketing arrangements.

4. The level of the equilibrium exchange rate strongly influences social profitability. Social profits of tradable commodities like rice increase as the exchange rate depreciates and decrease as the exchange rate appreciates.

5. The government has to decide whether to increase or decrease the level of protection of rice production. Farming interests (and some politicians) want to increase rice protection to transfer incomes to rice surplus households. But protection of rice harms poor consumers, worsens poverty, reduces human nutrition, raises labor costs, and wastes scarce resources.

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Appendices

Table 1. Physical Input-Output Data for Paddy - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
Tradables	Fertilizer (kg/ha)			
	Urea	129	163	194
	TSP	68	58	65
	Pesticides (l/ha)			
	Akodan	0.8	0.5	1
	Decis	0	0	0
	Chemical for growing stimulation (l/ha):			
	Decamon	0.1	0.1	0.1
	Seed (kg/ha)	75	63	49
Factors	Labor (manday/ha)			
	Seedbed Prep	3	2	2
	Planting	15	15	18
	Crop care of pest and disease	3	1	1
	Fertilizing	4	3	2
	Weed clearing	9	8	7
	Care from birds	15	14	14
	Harvesting	55	55	56
	Drying	3	6	7
	Oxen Labor (unit/ha):			
	Cultivation	12	11	10
	Transportation	3	2	2
	Capital			
	Working Capital (Rp)	3,017	2,901	3,247
	Sprayer rent (hr/ha)	18	9	8
	Thresher rent (hr/ha)	19	19	19
	Land (ha)	1	1	1
Output	(kg before milling/ha)	4,230	4,235	4,254

Table 2. Private Prices - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
Tradable	Fertilizer (Rp/kg)			
	Urea	1.500	1.500	1.500
	TSP	2.800	2.800	2.800
	Pesticides (Rp/l)			
	Akodan	150.000	150.000	150.000
	Decis	0	0	0

Table 2. Private Prices - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
	Chemical for growing stimulation (Rp/l):			
	Decamon	200.000	200.000	200.000
	Seed (kg/ha)	1.800	1.779	1.764
Factors	Labor (Rp/man-day)			
	Seedbed Prep	25.000	29.993	30.004
	Planting	26.923	25.467	25.034
	Crop care of pest and disease	30.000	30.000	30.000
	Fertilizing	26.670	27.195	26.477
	Weed clearing	25.000	25.321	26.218
	Care from birds	30.000	30.000	30.000
	Harvesting*	25.000	25.000	25.000
	Drying	20.000	19.999	19.999
	Oxen Labor (Rp/unit):			
	Cultivation	50.000	50.000	50.021
	Transportation	50.000	50.000	50.021
	Capital			
	Working Capital	6%	6%	6%
	Sprayer rent (Rp/hr)	357	357	357
	Thresher rent (Rp/hr)	3.571	3.571	3.571
	Land (Rp/ha)	1.206.250	1.207.686	1.213.181
Output	Rp/kg	1.716	1.733	1.735

Table 3. Private Budgets (Rp. 000/ha) - Wet Season

I-O	**Quantities**	**Semi-technical**		
		< 0.5 ha	**0.5-1,0 ha**	**> 1.0 ha**
Tradable	Fertilizer			
	Urea	194	245	291
	TSP	189	163	181
	Pesticides			
	Akodan	113	78	108
	Decis	0	0	0
	Chemical for growing stimulation (Rp/l):			
	Decamon	25	22	24
	Seed	134	113	87
Factors	Labor			
	Seedbed Prep	63	49	47
	Planting	412	392	462
	Crop care of pest and disease	75	39	36
	Fertilizing	94	89	58
	Weed clearing	229	214	183
	Care from birds	450	420	420

Table 3. Private Budgets (Rp. 000/ha) - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
	Harvesting	1.382	1.383	1.389
	Drying	60	110	135
	Oxen Labor			
	Cultivation	600	550	500
	Transportation	145	118	119
	Capital			
	Working Capital	181	174	195
	Sprayer rent	6	3	3
	Thresher rent	0	0	0
	Land	1.206	1.208	1.213
Output	Total Revenue	7.259	7.339	7.381
	Total Costs (including land)	5.557	5.369	5.451
	Profit (including land cost)	1.702	1.970	1.931
	Total Costs (excluding land cost)	4.351	4.162	4.237
	Profit (excluding land cost)	2.908	3.178	3.144

Table 4. Social Prices - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
Tradable	Fertilizer (Rp/kg)			
	Urea	1.161	1.161	1.161
	TSP	2.179	2.179	2.179
	Pesticides (Rp/l)			
	Akodan	150.000	150.000	150.000
	Decis	0	0	0
	Chemical for growing stimulation (Rp/l):			
	Decamon	200.000	200.000	200.000
	Seed (kg/ha) *	1.400	1.379	1.364
Factors	Labor (Rp/man-day) **			
	Seedbed Prep	25.000	29.993	30.004
	Planting	26.923	25.467	25.034
	Crop care of pest and disease	30.000	30.000	30.000
	Fertilizing	26.670	27.195	26.477
	Weed clearing	25.000	25.321	26.218
	Care from birds	30.000	30.000	30.000
	Harvesting	25.000	25.000	25.000
	Drying	20.000	19.999	19.999
	Oxen Labor (Rp/unit):			
	Cultivation	50.000	50.000	50.021
	Transportation	50.000	50.000	50.021
	Capital			

Table 4. Social Prices - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
	Working Capital ***	5,0%	5,0%	5,0%
	Sprayer rent (Rp/hr)	357	357	357
	Thresher rent (Rp/hr)	3.571	3.571	3.571
	Land (Rp/ha)	2.062.250	2.062.250	2.062.250
Output	Rp/kg	1.245	1.245	1.245

Table 5. Social Budgets (Rp. 000/ha) - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	0.5-1,0 ha	> 1.0 ha
Tradable	Fertilizer			
	Urea	150	189	225
	TSP	147	127	141
	Pesticides			
	Akodan	113	78	108
	Decis	0	0	0
	Chemical for growing stimulation :	0	0	0
	Decamon	25	22	24
	Seed	105	87	67
Factors	Labor			
	Seedbed Prep	63	49	47
	Planting	412	392	462
	Crop care of pest and disease	75	39	36
	Fertilizing	94	89	58
	Weed clearing	229	214	183
	Care from birds	450	420	420
	Harvesting	1.382	1.383	1.389
	Drying	60	110	135
	Oxen Labor			
	Cultivation	600	550	500
	Transportation	145	118	119
	Capital			
	Working Capita	151	145	162
	Sprayer rent	6	3	3
	Capital rent	0,181	0,187	0,201
	Land	2.062	2.062	2.062
Output	Total Revenue	5.266	5.272	5.296
	Total Costs (including land)	6.267	6.078	6.142
	Profit (including land cost)	-1.001	-806	-846
	Total Costs (excluding land cost)	4.205	4.016	4.080

Table 5. Social Budgets (Rp. 000/ha) - Wet Season

I-O	Quantities	Semi-technical		
		< 0.5 ha	**0.5-1,0 ha**	**> 1.0 ha**
	Profit (excluding land cost)	1.061	1.256	1.217

Table 6. Wet Season Paddy PAMs
Semi-Technical Irrigation System (Rp. 000/ha)

	Tradable		Domestic Factors				
Levels	Output	Inputs	Labor	Capital	Land	Profits*	Profits
Private							
< 0.5 ha	7.259	655	3.508	187	1.206	2.908	1.702
0.5 - 1.0 ha	7.339	620	3.364	177	1.206	3.178	1.971
> 1.0 ha	7.381	690	3.349	198	1.206	3.144	1.938
Social							
< 0.5 ha	5.266	539	3.508	157	2.062	1.061	-1.001
0.5 - 1.0 ha	5.272	503	3.364	148	2.062	1.256	-806
> 1.0 ha	5.296	565	3.349	166	2.062	1.217	-846
Divergences							
< 0.5 ha	1.993	116	0	30	-856	1.847	2.703
0.5 - 1.0 ha	2.067	117	0	29	-856	1.921	2.777
> 1.0 ha	2.085	126	0	32	-856	1.927	2.783

Table 7. The Influence of Exchange Rate Assumptions on Profitability

Exchange Rate/Land Size	Private			Social		
	Revenue	Cost	Profit	Revenue	Cost	Profit
Rp 8000/$US						
< 0.5 ha	7259000	4351000	2908000	4686000	4211000	475000
				-2573000	**-140000**	**-2433000**
0.5 – 1 ha	7339000	4161000	3178000	4692000	4021000	671000
				-2647000	**-140000**	**-2507000**
> 1 ha	7381000	4237000	3144000	4713000	4084000	629000
				-2668000	**-153000**	**-2515000**
Average						
				-2629333	-144333	-2482333
Rp 9000/$US						
< 0.5 ha	7259000	4351000	2908000	5266000	4206000	1060000
				-1993000	**-154000**	**-1848000**
0.5 – 1 ha	7339000	4161000	3178000	5272000	4017000	1255000
				-2067000	**-144000**	**-1922000**
> 1 ha	7381000	4237000	3144000	5296000	4080000	1216000
				-2067000	**-157000**	**-1928000**
Average						

Table 7. The Influence of Exchange Rate Assumptions on Profitability

Exchange Rate/Land Size	Private			Social		
				-2042333	-148667	-1897333
Rp 10.000/$US						
< 0.5 ha	7259000	4351000	2908000	5846000	4259000	1587000
				-1413000	**-92000**	**-1321000**
0.5 – 1 ha	7339000	4161000	3178000	5853000	4070000	1783000
				-2045000	**-91000**	**-1395000**
> 1 ha	7381000	4237000	3144000	5879000	4139000	1740000
				-1502000	**-98000**	**-1404000**
Average						
				-1653333	-93667	-1370333

Table 8. Output-Import Parity

Computational Steps	**Paddy**
(1) F.o.b. Thai 5% broken ($/ton) *	186,5
(2) Freight & Insurance ($/ton)	17,5
(3) C.I.f. Bitung ($/ton)	204,0
(4) Exchange rate (Rp/$)	9.000
(5) Exchange rate premium (%)	0%
(6) Equilibrium exchange rate (Rp/$)	9.000,0
(7) C.I.f. in domestic currency (Rp/ton)	1.836.000
(8) Weight conversion factor (kg/ton)	1.000
(9) C.I.f. in domestic Currency (Rp/kg)	1.836,0
(10) Port handling, storage & losses	5%
(11) Transportation costs (Rp/kg)	13
(12) Marketing costs (Rp/kg rice)	20
(13) Value before processing (Rp/kg)	1.960,8
(14) Processing conversion factor, dry Paddy (GKG) to rice (%)	64,0%
(15) Import parity value at wholesale (Rp/kg)	1.254,9
(16) Distribution costs to farm (Rp/kg)	10
(17) Import parity value at farm gate (Rp/kg)	1.244,9

Source: *) World Bank, http://www.worldbank.org/prospects *** Commodity Price Data Pinksheet - December 2003

Table 9. Input-Import Parity

Computational Steps	TSP
(1) F.o.b. ($/ton) *	132,2
(2) Freight & Insurance ($/ton)	93,0
(3) C.I.f. Bitung ($/ton)	225,2
(4) Exchange rate (Rp/$)	9.000
(5) Exchange rate premium (%)	0%
(6) Equilibrium exchange rate (Rp/$)	9.000,0
(7) C.I.f. in domestic currency (Rp/ton)	2.026.800
(8) Weight conversion factor (Kg/ton)	1.000
(9) C.I.f. in domestic Currency (Rp/kg)	2.026,8
(10) Port handling and Storage	91,0
(11) Transportation costs (Rp/kg)	26
(12) Marketing costs (Rp/kg rice)	15
(13) Value before processing (Rp/kg)	2.158,8
(14) Processing conversion factor (%)	100,0%
(15) Import parity value at wholesale (Rp/kg)	2.158,8
(16) Distribution costs to farm (Rp/kg)	20
(17) Import parity value at farm gate (Rp/kg)	2.178,8

Table 10. Export-Parity

Computational Steps	Urea
(1) C.I.F Europe ($/ton) *	97,1
(2) Freight & Insurance ($/ton)	28,6
(3) F.O.B Pale bang ($/ton)	68,5
(4) Exchange rate (Rp/$)	9.000
(5) Exchange rate premium (%)	0%
(6) Equilibrium exchange rate (Rp/$)	9.000,0
(7) F.O.B in domestic currency (Rp/ton)	616.500
(8) Weight conversion factor (Kg/ton)	1.000
(9) F.O.B. in domestic Currency (Rp/kg)	616,5
(10) Bagging and Shipping to Bitung Port (Rp/kg)	300,0
(10) Port handling and Storage	91,0
(11) Handling and distribution (Rp/kg)	83
(11) Marketing costs (Rp/kg)	20
(12) Value before processing (Rp/kg)	1.110,7
(13) Processing conversion factor (%)	100,0%
(14) Export parity value at wholesale (Rp/kg)	1.110,7
(15) Distribution costs to farm (Rp/kg)	50

Table 10. Export-Parity

Computational Steps	Urea
(16) Export parity value at farm gate (Rp/kg paddy)	1.160,7

Source: *) World Bank, http://www.worldbank.org/prospects *** Commodity Price Data Pinksheet - December 2003

Table 11. Import Parity for Peanut 2002

Output-Import-Parity	Peanut
(1) F.o.b. Vietnam ($/ton) *	485
(2) Freight & Insurance ($/ton)	15
(3) C.I.f. Bitung ($/ton)	500
(4) Exchange rate (Rp/$)	9.000
(5) Exchange rate premium (%)	0%
(6) Equilibrium exchange rate (Rp/$)	9.000,00
(7) C.I.f. in domestic currency (Rp/ton)	4.500.000
(8) Weight conversion factor (kg/ton)	1.000
(9) C.I.f. in domestic Currency (Rp/kg)	4.500,00
(10) Port handling, storage & losses	5%
(11) Transportation costs (Rp/kg)	10
(12) Marketing costs (Rp/kg)	15
(13) Value before processing (Rp/kg)	4.750,00
(14) Processing conversion factor/losses	95,00%
(15) Import parity value at wholesale (Rp/kg)	4.512,50
(16) Distribution costs to farm (Rp/kg)	10
(17) Import parity value at farm gate (Rp/kg)	4.502,50

Source:
*)http://www.fas.usda.gov/gainfiles/200312/146085359.pdf