THE COMPETITIVENESS OF RED ONION PRODUCTION IN BREBES, CENTRAL JAVA

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INTISARI

Tujuan dari penelitian ini adalah untuk mengetahui dampak penggunaan bibit bawang merah impor terhadap produktivitas, keuntungan dan daya saing bawang merah di Kabupaten Brebes. Metode analisis yang digunakan adalah Matriks Analisis Kebijakan (*Policy Analysis Matrix/PAM*). Metode ini dapat untuk mengetahui efisiensi ekonomi, daya saing dan dampak kebijakan pemerintah terhadap sistem usahatani bawang merah. Data yang digunakan adalah data primer (hasil wawancara dengan petani) dan sekunder dari instansi terkait (BPS, Deperindag, Deptan, FAO, Bank Indonesia dan World Bank). Dari hasil analisis diketahui usahatani bawang merah pada dasarnya masih menguntungkan. Petani yang menggunakan bibit bawang merah impor menghasilkan produksi dan keuntungan (privat dan sosial) lebih tinggi dibanding yang menggunakan varietas lokal. Disamping itu juga diketahui adanya kebijakan pemerintah di pasar input telah menyebabkan petani membeli input dengan harga yang lebih tinggi dibanding harga sesungguhnya.

Kata kunci : benih impor, local, produktivitas, keuntungan, daya saing

INTRODUCTION

Indonesian production of red onions increased markedly during the 1990s. Red onion production in Indonesia was 495,183 tons in 1990 and rose to 977,349 tons in 2000. The Province of Central Java contributed 21.7 % of Indonesia's total red onion output in 2000. At the district level, Brebes was the highest red onion producer, accounting for about 90 % of total red onion production in Central Java. But the productivity of red onion production in Central Java decreased from 9.27 ton/ha in 1997 to 7.70 ton/ha in 2002 (Table 1).

The decreasing productivity was caused by the overuse of soil nutrients through continual planting of red onions and the farmers' use of own production for seeds rather than of selected seeds. To increase their onion production, a small number of farmers used imported seeds, either from Thailand or the Philippines. Since the price of the imported seeds was higher than that of local seeds, most farmers chose not to use the imported seeds. This research examines the impact of the use of imported seeds on red onion production in Brebes.

The objective of the study is to determine the impact of the use of imported seeds on the productivity, profitability, and competitiveness of red onion in Brebes, Central Java.

RESEARCH METHOD

The method used in this research was the Policy Analysis Matrix (PAM). This method can be used to examine the economic efficiency and the competitiveness of red onion farming systems and the impact of government policies. The data used in to construct the red onion PAMs were costs and revenues at the farm level, measured in both private and social prices. This information was obtained through face-to-face interviews with farmers.

The sample of farmers to interview was drawn from two sub-districts of Brebes District.

Complete budget data were obtained from a sample of 40 farmers. The sample included 20 farmers who planted local red onion seeds and another 20 farmers who used imported seeds.

The inputs used in red onion production were divided into tradable and nontradable categories. Supporting data included the import price of red onions, the regional inflation rate, and the national exchange rate. That secondary information was obtained from official publications of government and donor agencies, including the BPS (Central Bureau of Statistics), FAO, World Bank, and the Bank of Indonesia.

With inputs from primary and secondary data, the full PAMs for red onion production were derived. To facilitate the compilation of the PAMs, the data were arranged into a nested series of tables: (1) Assumptions, (2) Input-output, (3) Private prices, (4) Private budget, (4) Import parity prices, (5) Social prices, (6) Social budget, (7) PAMs and, (8) Ratios that indicate policy distortions and degrees of efficiency.

RESEARCH RESULTS AND ANALYSIS

Description of Research Sites

The district of Brebes lies in the northern part of the western side of Central Java Province, between 108°41'37,7" – 109°11'28,92" Eastern Longitude and 6°44'56,5" – 7°20'51,48" Southern Latitude. To the north is the Java Sea, to the east lie the District of Tegal and Tegal City, to the south is the sub-province of Banyumas, and to the west is the sub-province of Cirebon.

Based on the Schimdt-Fergusson classification, the climate of Brebes District is categorized as a wet (or C) climate. This type of climate is suitable for red onion farming, because red onions require little moisture during the planting season but a lot of water during the growing period. The average temperature in Brebes District is 26,22 °C, an ideal temperature for red onion production.

The total area of Brebes District is 166,117 hectares. Land allocation includes 63,353 hectares of lowland rice (paddy area),

18,492 hectares of gardens/buildings, 17,757 hectares of dry land/plantation, 7,984 hectares of fish-pond/swampy area, 4,400 hectares of community forest/woody plants, 49,050 hectares of national forest, 774 hectares of state/private estate, and 4,307 hectares of others. Red onions are cultivated in the lowland (paddy) area. The typical seasonal cropping patterns during one year are paddy–red onion–red onion, paddy–red onion–vegetables, and red onion–red onion–red onion. For this research, observations were taken only in one planting season, the second planting season, because imported seeds could be planted only during that period.

In recent years, the production of red onions in Brebes fluctuated because of wide swings in harvested area. But the productivity of red onion has steadily declined. The productivity decreased from 97.91 quintals/hectare (9.791 tons/hectare) in 1998 to 82.42 quintals/hectare in 2002. The production, harvested area, and productivity of red onions in Brebes between 1998 and 2002 are shown in Table 2.

Most of the red onion seeds planted by farmers in Brebes are local varieties. Only a small number of farmers planted imported seeds. The farmers interviewed had an average productivity of 13.37 tons/hectare if they planted imported red onion seeds, 57 percent above the average yield of farmers planting local seeds (8.51 tons/hectare). But the imported seeds can be cultivated only in fertile land and planted only in the dry season (around July). Attempts to plant imported red onion seeds in the first or third seasons generally fail because of excessive rainfall.

The Policy Analysis Matrix

Assumptions

The real private interest rate per annum was 20%, the nominal interest rate observed in the villages adjusted for inflation. Working capital for many farmers was obtained from the People's Credit Bank (Bank Perkreditan Rakyat/BPR) or the Ministry of Cooperatives (Koperasi) in the villages. The nominal interest rate of loans was 30 % per year, and the inflation

rate was 10 % per year. Hence, the real private interest rate was 20 % per year or 6.7 % per season. The real social interest rate per annum was estimated to be 13 % (adjusted for inflation), so that the real social interest rate per season was 4.3 %. The official exchange rate was observed to be Rp 9,000/US$. An average tax rate of 10% was observed to exist on pesticide inputs.

Input-Output Relationships

Input-output data were gathered from interviews with red onion farmers in Brebes. Separate budgets were constructed for farming systems that used local and imported seeds. Input costs included the full range of activities from land preparation through post-harvest processing. Hired laborers did most of the work on red onion farms.

On-farm activities included land preparation, planting, fertilizing, controlling pest and disease, watering and weed control, harvesting, and post-harvest processing (Table 3).

Most farmers used inorganic fertilizers, such as TSP, Urea, KCl, ZA, NPK, SP-36, Sondawa Putih, and Kamas. A few farmers applied organic fertilizer in relatively small doses.

Red onion farmers are highly dependent on pesticide applications. Usually, farmers sprayed their onion plants once every two days. During the rainy season, the frequency of spraying was increased. In pesticide applications, farmers mixed three or more kinds of pesticides. According to a study done by the Team of Agriculture Faculty UNS (2003), there was no residue of active material of pesticides found in fresh red onions harvested in Brebes.

Private Prices and Budget

Private prices were obtained from interviews with farmers and retail traders. The typical wage rate for hired unskilled labor was Rp 15,000/day. That wage rate was used also to assess the private costs of family labor. The prices of imported and local seeds were Rp 5,250/kg and Rp 4,976/kg, respectively (Table 4).

Kind of Input / Output	Item	Imported	Domestic
Tradable Inputs	1. Seeds (kg/ha)	1,154	1,186
	2. Fertilizers		
	a. Chemical Fertilizers (kg/ha)	1,687	1,210
	b. Compost (package)	1	1
	3. Pesticide (Package)	1	1

Table 1. Production and Productivity of Red Onion in Central Java, 1997 – 2001

Year	Area (Ha)	Production (ton)	Productivity (ton/ha)
1997	17,724	164,218	9.27
1998	21,279	192,063	9.03
1999	38,546	325,587	8.45
2000	25,830	212,312	8.22
2001	29,745	229,715	7.72
2002	27,323	210,407	7.70

Source : Agriculture Extension Service Central Java, 2002

Table 2. Harvested Area, Production, and Productivity of Red Onions in Brebes District, 1998 – 2001

Year	Harvested Area (hectare)	Production (quintal)	Productivity (quintal/hectare)
1998	15,242	1,492,410	97.91
1999	26,578	2,444,562	91.98
2000	16,993	1,529,241	89.99
2001	21,333	1,729,246	81.06
2002	18,681	1,539,638	82.42

Source : Central Statistic Bureau District of Brebes, 2002

Because it was not possible to estimate the social profits of the next best alternative crop that could be planted on land used for red onion production, the opportunity costs of land had to be omitted. Profit then was defined to include the returns to land and management. The output price for red onions varied quite widely over time. During the interview period, the price for red onions produced with imported seeds was Rp 2800/kg, somewhat less than the price for red onions produced with local seed, Rp 3000/kg.

The private budget provides the entries for the first row of the PAM. In PAM research, the private budget is calculated by multiplying the physical input-output relationships (Table 3) by the counterpart private prices.

Parity Prices for Outputs and Inputs

Import (or export) parity prices for tradable inputs and outputs are required to calculate social prices and thus the social budget for red onion systems

Table 3. Input-Output Relationship for Red Onion Production in Brebes, per Hectare, for Farming Systems using Local and Imported Seeds

Kind of Input / Output	Item	Imported	Domestic
Tradable Inputs	1. Seeds (kg/ha)	1,154	1,186
	2. Fertilizers		
	a. Chemical Fertilizers (kg/ha)	1,057	1,210
	b. Compost (package)	1	1
	3. Pesticide (Package)	1	1

Domestic factors	1. Labor (Md/ha)		
	- Family labor	3	69,5
	- Hired labor	812	428
	2. Others		
	a. Irrigation (package)	1	1
	b. Water pump (package)	1	1
	c. Others (package)	1	1
	3. Working capital (Rp/ha)	22,558,839	16,746,174
Output	Production (kg/ha)	13,369	8,509

Source : Interviews with the red onion farmers in Brebes District

The calculation of the import parity price for red onions began with the fob price at the Philippines port and ended with the social price at the farmers' level in Brebes District. The fob price in the Philippines, US$ 310/ton, was used as the base price because most red onion imports into Indonesia originated in the Philippines. The cost of freight and insurance from the Philippines to the Indonesian (Tandjung Priok) was US$ 17.5/ton, and the exchange rate was Rp 9,000/US$1. With these parameters, the cif price at Tandjung Priok harbor was calculated as Rp 2,947.5/kg. The

addition of transportation and handling charges costs from Tandjung Priok to Brebes gave a cif red onion price at Brebes of Rp 3,303.8/kg. Red onions were imported in a dry condition, so it was necessary to adjust for moisture content. Dry red onions weighed 15 percent less than wet red onions. The import parity price of wet red onions at the farm gate was Rp 2,788/kg.

The calculation of the export parity price for urea fertilizer followed the same logic as that for the import parity price of red onions (Table 7). The export parity price for urea was Rp 1,068.3/kg.

Table 4. Private Budget for Red Onion Production in Brebes, for Farming Systems using Local and Imported Seeds (Rp per Hectare)

Kind of Input / Output	Item	Imported	Domestic
Tradable Inputs	1. Seed	6,057,813	5,903,227
	2. Fertilizers		
	a. Chemical Fertilizers	2,041,120	2,003,451
	b. Compost	177,579	464,853
	3. Pesticide	1,578,680	1,796,387
Domestic factors	1. Labor		
	- Family labor	54,644	1,041,292
	- Hired labor	11,737,729	6,432,139
	2. Others		
	a. Irrigation (Rp/package)	934,524	48,798
	b. Water pump (Rp/package)	8,929	38,816

	c. Others (Rp/package)	22,464	58,503
	3. Working capital	1,503,923	1,116,412
Output	Revenue	37,433,333	25,527,342

Source : Interviews with the red onion farmers in Brebes District

Table 5. Import Parity Price for Red Onions for Red Onion Production in Brebes, for Farming Systems using Local and Imported Seeds

No	I t e m	Red Onion
1	FOB Price (US$/ton) in the Philippines, September 2002	310.0
2	Freight and Insurance (US$/ton)	17.5
3	CIF Price (US$/ton)	327.5
4	Exchange Rate (Rp/US$)	9,000.0
5	CIF Price (Rp/kg)	2,947.5
6	Transportation and handling (Rp/kg) :	
	a. Jakarta to Brebes	125.0
	b. Handling	25.0
	c. Importers' profit 7 %	206.3
7	Value before processing (Rp/kg)	3,303.8
8	Processing conversion factor (%)	85 %
9	Import parity at wholesale (Rp/kg) [1]	2,808.3
10	Distribution cost to farm (Rp/kg)	20.0
11	Import parity value at farm (Rp/kg)	2,788.3

[1] Wet red onion

Table 6. Export Parity Price for Urea for Red Onion Production in Brebes, for Farming Systems using Local and Imported Seeds

No	I t e m	Urea
1	FOB Price (US$/ton)	108.7
2	Exchange Rate (Rp/US$)	9,000.0
3	FOB Price (Rp/kg)	978.3
4	Transportation and handling (Rp/kg) :	
	a. Jakarta to Brebes	50.0
	b. Handling	20.0
5	Value before processing (Rp/kg)	1,048.3
6	Processing conversion factor (%)	100%
7	Export parity at wholesale (Rp/kg)	1,048.3
8	Distribution cost to farm (Rp/kg)	20.0
9	Export parity value at farm (Rp/kg)	1,068.3

Table 7. Import Parity Prices for Inputs for Red Onion Production in Brebes, for Farming Systems using Local and Imported Seeds

No	I t e m	ZA MH	SP-36 MH	KCl MH	NPK MH
1	CIF Price (US$/ton)	97.6	149.0	135.0	167.0
2	Exchange Rate (Rp/US$)	9,000.0	9,000.0	9,000.0	9,000.0
3	CIF Price (Rp/kg)	878.4	1,341.0	1,215.0	1,503.0
4	Transportation and handling (Rp/kg)				
	a. Jakarta - Brebes	50.0	50.0	50.0	50.0
	b. Handling	20.0	20.0	20.0	20.0
5	Value before processing (Rp/kg)	948.4	1,411.0	1,285.0	1,573.0
6	Processing conversion factor (%)	100%	100%	100%	100%
7	Export parity at wholesale (Rp/kg)	948.4	1,411.0	1,285.0	1,573.0
8	Distribution cost to farm (Rp/kg)	20.0	20.0	20.0	20.0
9	Import parity value at farm (Rp/kg)	968.4	1,431.0	1,305.0	1,593.0

The import parity prices for ZA, SP-36, KCl, and NPK per kilogram were Rp 968.4, Rp 1,431, Rp 1,305 and Rp 1,593, respectively (Table 8).

Social Prices and Budget

The social prices of tradable inputs (seed and fertilizers) are their import (or export) parity prices. The social prices of Sondawa Putih, Kamas, and organic fertilizer are assumed to be the same as their private prices. For pesticides, the social price is calculated by adjusting the private price for an assumed tax of 10 percent.

The social budget is calculated by multiplying tradable inputs, domestic factors, and outputs in the input-output table (Table 3) by their social prices.

Because of the much higher yields, the total social revenue of farming with imported seeds, Rp 37,276,264, was 57 percent higher than that of the system with local seeds, Rp 23,725,548. In contrast, the total social costs of producing red onions with imported seeds, Rp. 20,107,890, were only 31 percent higher than the social costs of farming with local seeds, Rp. 15,418,283. Hence, the social profits were much greater in the red onion system with imported seeds.

Table 8. Social Budget for Red Onion Production in Brebes, for Farming Systems using Local and Imported Seeds (Rp per Hectare)

Kind of Input / Output	Item	Imported	Domestic
Tradable Inputs	1. Seed	6,057,813	5,903,227
	2. Fertilizers		
	a. Chemical Fertilizers	1,556,382	1,683,777
	b. Compost	177,579	464,853
	3. Pesticide	1,420,812	1,616,749
Domestic factors	1. Labor		
	- Family labor	54, 644	1,041,292
	- Hired labor	11,737,729	6,432,139
	2. Others		
	a. Irrigation	934,524	48,798
	b. Water pump	8,929	38,816
	c. Others	22,464	58,503
	3. Working capital	977,550	725,668
Output	Revenue	37,276,264	23,725,548

PAM Results

The PAMs for both red onion systems are based on the data from the private and social budgets (Table 9). The private row in the PAM table uses values from the private budget, while the social row in the PAM is taken from the social budget. The third row of PAM, measuring the effects of divergences, is found by subtracting the second row from the first row.

The divergences on red onion output were small and insignificant. No policy distortions or market failures were observed in the output market. The measured divergences were caused by small errors in the data. The divergences on tradable inputs were quite small (5-7 percent) and positive, indicating that producers were taxed.. This transfer resulted mainly from an import tariff on pesticides of 10 percent. The divergence in the capital market arose from imperfections that caused the private interest rate to exceed the social interest rate.

Because it was not possible to obtain data on the next best alternative use of land devoted to red onion production, the opportunity cost of land was omitted. Consequently, profit was defined as the returns to management and land. The private profit for red onion farming system using imported seeds was Rp 13,315,929/ha, more than double the private profit from the system using local seeds. The social profit from planting imported seeds, Rp 14,327,839/ha, was two and one-half times the social profit from planting local seeds. The yields attainable with imported seeds were 50 percent higher than those with local seeds. These results point to large potential gains in farm incomes and efficiency if red onion farmers switch from local to imported seeds. The constraints limiting adoption of imported seeds in the second season require further study. The cost of imported seeds was only slightly higher than that of local seeds. Some farmers reported a difficulty in obtaining imported seeds, but the reason was not clear.

Table 9. PAMs for Red Onion Production in Brebes, for Farming Systems using Local and Imported Seeds (Rp per Hectare)

| | Revenue | Tradable Inputs | Domestic Factors | | | | | Profit |
			Labor	Capital	Land	Others	Total	
Imported								
Private	37,433,333	9,677,613	11,792,372	1,503,923	0	1,143,496	14,439,791	13,315,929
Social	37,276,264	9,035,007	11,792,372	977,550	0	1,143,496	13,913,418	14,327,839
Divergences	157,070	642,606	0	526,373	0	0	526,373	- 1,011,909
Local								
Private	25,527,342	9,703,066	7,473,431	1,116,412	0	610,970	9,200,813	6,623,464
Social	23,725,548	9,203,754	7,473,431	725,668	0	610,970	8,810,069	5,711,725
Divergences	1,801,794	499,312	0	390,744	0	0	390,744	911,738

CONCLUSION AND POLICY IMPLICATIONS

Conclusion

Farms using imported seeds for red onion production earned much higher private and social profits compared with those using local seeds. The profits from planting local seeds were high. But the private profits from imported seeds were double those from local seeds, and the social profits of the system using improved seeds were two and one-half times those from the system using local seeds. It was not clear what limitations prevented more farmers from adopting the improved technology.

Policy Implications

It would be desirable if the government could carry out the following measures:
1. Increase the availability of imported seeds for red onion farmers in Brebes District.
2. Raise the yield of both imported and local seed by improving red onion farming practices and seed selection

3. Improve rural financial intermediation so that affordable loans would be readily available to allow red onion farmers to buy imported seeds and cover the costs of other inputs.

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