THE COMPETITIVENESS AND EFFICIENCY OF RICE-FARMING SYSTEMS IN NORTH BENGKULU DISTRICT, BENGKULU PROVINCE

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Summary

Rice is the staple food in Indonesia. In recent years, Indonesia has been a large net importer of rice. The government would like to reduce rice imports and re-gain rice self-sufficiency. Currently, the government imposes a rice tariff of about 30 percent (Rp 430/kg) and a rice seed subsidy of Rp400/kg to encourage rice production.

The objectives of this study are to analyze whether the rice-farming systems in Bengkulu are profitable (socially and privately) and whether they would be privately profitable if protection policy were reduced (as it should be in the future to accord with AFTA commitments).

According to the PAM analyses carried out in the study, the rice farming systems in North Bengkulu, in both the wet and dry seasons, were highly competitive. They earned private profits (inclusive of land costs) of Rp 2.7 million per hectare and 3.3 million per hectare, respectively. Those systems were also very efficient. They earned social profits (inclusive of land costs) of Rp 1.8 million per hectare and 2.2 million per hectare, respectively. This competitiveness would be reduced in the future (by 2010) if Indonesia complies with its AFTA commitments and eliminates protection on rice.

Private profits from rice production in North Bengkulu were nearly half again as great as they would have been in the absence of policies and market failures. The positive net transfer was caused almost entirely by the 25 percent rate of protection afforded by the tariff on rice output. If that tariff were removed, the net transfer would turn negative and rice-farming systems in Bengkulu would be taxed somewhat by policies and corruption affecting tradable inputs. But social profits would remain at nearly half of social rice revenue, before land costs. Bengkulu rice farmers thus will be able to compete effectively against imported rice unless the future opportunity costs of land become very high. Since rice is the most profitable crop in the region, there is no reason to anticipate that land costs will rise substantially, eroding the area’s comparative advantage in growing rice.
Introduction

Background

Rice is the staple food in Indonesia. In recent years, Indonesia has been a large net importer of rice. The government would like to reduce rice imports and re-gain rice self-sufficiency. Currently, the government imposes a rice tariff of about 30 percent (Rp 430/kg) and a rice seed subsidy of Rp400/kg to encourage rice production.

In 2001, the total production of rice in Bengkulu Province under wet and dry land was 342,014 tons and 34,959 tons, respectively. Most rice (20,954 hectares) was produced in North Bengkulu under sawah with technical irrigation. The 1.6 million people in Bengkulu consumed about 117 kg of rice/capita/year, and thus rice consumption approached 1.9 million tons, creating a large net deficit.

Research Objectives

The objectives of this study are to analyze whether the rice-farming systems in Bengkulu are profitable (socially and privately) and whether they would be privately profitable if protection policy were reduced (as it should be in the future to accord with AFTA commitments).

Research Methodology

Site Selection and Research Procedures

The Policy Analysis Matrix (PAM) approach was used to examine competitiveness, efficiency, and policy transfers. The main aim of the method was to measure the social and private profitability of rice-farming systems in Bengkulu.

The data were divided into primary and secondary data. The primary data consisted of costs of production and valuations of output at the farm-gate level, collected through surveys of farmer households. Sixty farm households, chosen at random in each of two areas, were interviewed. Secondary data were collected from government statistical records and from other relevant institutions. Additional technical information about rice farming systems came from interviews with local experts.

The research was conducted in Kemumu village, sub-district Arga Makmur, North Bengkulu District, Bengkulu Province. The two farming systems studied used the common water technology (irrigated water) in both wet and dry seasons. Survey data were gathered through application of structured questionnaires. Complementary information was obtained through a qualitative approach that used in-depth interviews for gathering information not covered in the farm household surveys.
Assumptions and Inputs

Macro-economic Assumptions

Macro-economic variables influenced farm-level profits in North Bengkulu. The principal macro-economic assumptions used in this research are shown in Table 1.

<table>
<thead>
<tr>
<th>Macro-economic Assumptions</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Exchange Rate (Rp/$)</td>
<td>8500</td>
</tr>
<tr>
<td>Inflation rate (annual %)</td>
<td>6</td>
</tr>
<tr>
<td>Nominal Interest Rate (annual %)</td>
<td>18</td>
</tr>
<tr>
<td>Social Interest Rate (% per season)</td>
<td>8</td>
</tr>
<tr>
<td>Social Interest Rate (annual %)</td>
<td>24</td>
</tr>
</tbody>
</table>

Input-Output Relationships

The input-output data were collected through farm household surveys, focus group discussions, and in-depth interviews with experts. The physical input-output data were divided into tradable inputs and domestic factors. Tradable inputs were those traded on international markets. The most important tradable inputs were fertilizers (Urea, SP-36, and KCl), seed (the variety used by most rice-farmers at Kemumu was IR-64), and chemicals. Domestic factors were labor, capital, and land. These inputs were nontradable because there were no international markets for them. Both hired and family labor was mostly non-skilled. Hired laborers came from areas close to Kemumu village, and none were from outside the province.

Rice yields, in terms of tons of wet rice (Gabah Kering Panen or GKP) per hectare, were 4.3 tons/ha in the wet season and 5.1 tons/ha in the dry season. Yields were about 18 percent higher in the dry season because the variety planted, IR-64, was sensitive to blast attack during the wet season but not during the dry season.

Private Prices

Private prices were the actual observed prices of all inputs and output at the farm-gate. These data were derived from focus group discussions, in-depth interviews, and farm surveys. Private prices of all tradable inputs were the same in both the wet and dry seasons. Most rice farmers interviewed planted their own seeds, rather than the high-yielding seeds available from PT Pertani.

The private wage rate for land preparation (for a hired laborer operating a hand-tractor) was Rp 12,000 per man-day per hectare. Most other activities, such as seedbed preparation (including planting), crop care (weeding, fertilizer, and chemical applications), and drying, were usually done with family labor. The wage rate for seed-preparation (including planting) was Rp1,125/hour, for crop care was Rp1,395/hour, and for drying was Rp 938/hour. The wage rates for harvesting and threshing were Rp 1200/hour and Rp1250/hours, respectively.
There were four potential sources of finance for rice farming in Kemumu – self-finance, kiosks and traders, government credit programs, and commercial banks. Commercial banks set the nominal savings rate at 12% per year, and this rate was the private opportunity cost of self-finance. The kiosks offered credit for fertilizers and chemicals while traders extended credit for land preparation. The cost of that credit was about 2-2.5 percent/month or 8 percent/season. Government credit programs, such as the KKP, set a subsidized interest rate for food commodities of 12% per year. The commercial banks charged at least twice that level. Most of the rice farmers interviewed were self-financed.

The land rental rate was about Rp1,050,000 per hectare in the wet season and Rp1,200,000 per hectare in the dry season. The price of output, in terms of wet rice (GKP) received by farmers right after harvest, was Rp1100 per kilogram in both the wet and dry seasons.

Private Budgets

Private profitability is defined as the difference between the value of rice produced and the costs of all inputs used in production, all valued in actual market prices. Private profits thus combine the underlying economic costs and valuations plus the effects of all policies and market failures (Monke and Pearson, 1989). The private budgets were constructed by multiplying the quantities in the Input-Output table by their related prices in the Private Prices table.

Social Prices

Outputs

The social price of rice output was based on comparable import prices for Thai rice. The Free on Board (FOB) price of the rice was US$170 per ton (35% broken) in Bangkok. Freight and insurance costs to Jakarta of US$17.50 per ton led to a CIF Indonesia price of US$187.5 per ton. The exchange rate was Rp 8500 per US$. The CIF price of rice in Indonesian currency was thus Rp1,593,750 per ton (CIF price times the exchange rate). Transportation, marketing, and distribution costs per kilogram of rice were Rp50, Rp 45 and Rp50, respectively. The import parity value of wet paddy (GKP) at local wholesale markets, therefore, was Rp 879/kg.

 Tradable Inputs

Import parity prices were used to find the social valuations of importable tradable inputs, such as pesticides, rice seed, SP-36, and KCl, whereas the export parity prices was used for urea, an exportable commodity.

Domestic Factors

The social value of labor was set equal to its private wage rate in both in the wet and dry seasons. Careful observation showed that no distorting policies or market failures significantly influenced the market for unskilled labor. It was not possible to estimate a social opportunity cost for land planted to rice, because none of the farmers interviewed planted anything other than rice. Therefore, the cost of land was eliminated from the valuation of the rice farming systems and both private and social profits were defined as the returns to management and land.
Social Budgets

Social profitability is defined as the difference between the value of rice produced and the costs of all inputs used in production, all valued in social (efficiency) prices. Social profits thus reflect only the underlying economic costs and valuations and are free of the effects of all policies and market failures (Monke and Pearson, 1989). The social budgets were constructed by multiplying the quantities in the Input-Output table by their related prices in the Social Prices table.

Policy Analysis Matrix (PAM) Results

The competitiveness and efficiency of rice-farming systems can be measured through the construction of PAMs. The analysis begins with the calculation of existing levels of private (actual market) and social (efficiency) revenues, costs, and profits. The results of the PAM analyses for wet and dry season rice farming are shown in Tables 2 and 3.

Table 2. Wet Season Paddy PAM

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Tradable Inputs</th>
<th>Total</th>
<th>Domestic Factors</th>
<th>Profits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seed</td>
<td>Fertilizer</td>
<td>Chemicals</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>4.730.000</td>
<td>55.200</td>
<td>420.000</td>
<td>28.700</td>
</tr>
<tr>
<td>Social</td>
<td>3.778.894</td>
<td>55.200</td>
<td>328.680</td>
<td>23.345</td>
</tr>
<tr>
<td>Divergence</td>
<td>951.106</td>
<td>0</td>
<td>91.320</td>
<td>5.355</td>
</tr>
<tr>
<td>Percentage</td>
<td>25</td>
<td>-</td>
<td>28</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 3. Dry Season Paddy PAM

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Tradable Inputs</th>
<th>Total</th>
<th>Domestic Factors</th>
<th>Profits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seed</td>
<td>Fertilizer</td>
<td>Chemicals</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>5.610.000</td>
<td>55.200</td>
<td>437.000</td>
<td>41.000</td>
</tr>
<tr>
<td>Social</td>
<td>4.481.944</td>
<td>55.200</td>
<td>339.908</td>
<td>33.351</td>
</tr>
<tr>
<td>Divergence</td>
<td>1.128.056</td>
<td>0</td>
<td>97.093</td>
<td>7.650</td>
</tr>
<tr>
<td>Percentage</td>
<td>25</td>
<td>-</td>
<td>29</td>
<td>23</td>
</tr>
</tbody>
</table>

Output Transfers

The divergence between private and social revenues is positive – Rp 951,106/ha in the wet season and Rp1,128,056/ha in the dry season. Rice farmers in Kemumu thus received higher revenue than they would have done in the absence of policies. The specific tariff of Rp 430/kg of milled rice (or Rp236.5 per kilogram of GKP) raised rice prices in Bengkulu by about 25 percent. The price rise did not reflect the full 30 percent protection of the tariff because of some rice smuggling into the province.

 Tradable Input Transfers

The tradable input transfer is the difference between the cost of the tradable input valued in private prices and the cost of the same input measured in social prices. In total, the
divergence was 24 percent in both the wet and dry seasons. Rice farmers paid nearly one fourth more than the social costs of their tradable inputs. Tradable inputs were taxed as a whole, but not all individual tradable inputs were taxed.

**Seed**

Rice seed experienced no divergence. Farmers mostly planted their own seeds. Although the government subsidized rice seeds provided by PT Pertani, almost no one bought those seeds.

**Fertilizers**

Fertilizers were taxed, by 28 percent in the wet season and by 29 percent in the dry season. The higher costs came from unofficial taxes (forced bribes taken by corrupt policemen) along the road from the wholesale market (in Bengkulu city) to the kiosks in Kemumu.

**Chemicals**

The divergence on pesticides was 23 percent in both the wet and dry seasons. This divergence arises from a combination of official taxes and unofficial bribes taken on the road from Bengkulu city to Kemumu.

**Domestic Factor Transfers**

The private costs of working capital were only 75 percent of their full social value in both seasons. These figures reflected the assumptions that the social opportunity cost of capital was estimated to be 24 percent per year whereas the private opportunity cost of capital was found to be only 18 percent per year. The private interest rate was low because most farmers self-financed their working capital costs. Since banks paid only about 12 percent annual interest, the opportunity costs of self-financing were low.

**Net Transfers.**

The net transfer is the sum of all divergences that cause private profits to differ from social profits (Monke and Pearson, 1989). In the Kemumu rice-farming systems, all of the transfers except the transfer from capital, were the result of distorting policies, not of market failures. The profit divergences (net transfer) of rice-farming systems were highly positive – about 49 percent in both seasons.

**Conclusion**

The rice farming systems in North Bengkulu, in both the wet and dry seasons, were highly competitive. They earned private profits (inclusive of land costs) of Rp 2.7 million per hectare and 3.3 million per hectare, respectively. Those systems were also very efficient. They earned social profits (inclusive of land costs) of Rp 1.8 million per hectare and 2.2 million per hectare, respectively. This competitiveness would be reduced in the future (by 2010) if Indonesia complies with its AFTA commitments and eliminates protection on rice.

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