

THE COMPETITIVENESS AND COMPARATIVE ADVANTAGES OF SoE KEPROK CITRUS FARMING IN TIMOR TENGAH SELATAN

(Keunggulan Komparatif dan Kompetitif Usahatani Jeruk Keprok SoE di Timor Tengah Selatan)

M. Robinson Pellokila, Wiendiyati dan Umbu R. Raya

Faculty of Agriculture Nusa Cendana University, Kupang

ABSTRAK

Penelitian ini bertujuan untuk mengetahui keunggulan kompetitif dari usahatani jeruk Keprok SoE dan dampak perubahan kebijakan yang disebabkan adanya beban pajak lokal sebesar 3%, pengurangan subsidi bahan bakar minyak hingga 22% dan proteksi impor sebesar 12% terhadap keunggulan kompetitif dari usahatani jeruk Keprok SoE. Kesimpulan dari hasil penelitian ini adalah usahatani jeruk Keprok SoE masih menguntungkan untuk diusahakan di bawah kebijakan yang berlaku (tarif impor 16%, subsidi bahan bakar minyak 33% dan pajak lokal 0%). Perubahan kebijakan menyebabkan penurunan keuntungan produsen sebesar 16% tetapi usahatani masih dapat dikelola karena adanya keunggulan kompetitif.

Kata kunci: keunggulan kompetitif, keunggulan komparatif.

I. INTRODUCTION

Citrus reticulata SoE or SoE Keprok Citrus from Timor Tengah Selatan in West Timor is well known for its taste and has had good consumer acceptances in Kupang,

Denpasar and Surabaya. This crop has been cultivated by local farmers in the most area of TTS because of climatic fitness and has become target of government assistances to increase farmers' income (Dinas Pertanian Tanaman Pangan dan Hortikultura, NTT, 2002).

Most of the farmers in TTS cultivate SoE Keprok in traditional ways; hence, the optimal production level has not been reached yet. Since decentralization, the local government of TTS placed Keprok as an important commodity to be developed, because of its potential to drive regional income. Recently the government works extensively on distributing Keprok seedlings to the farmers in order to expand the area of Keprok cultivation.

At least there are three policy issues concerning with the development of SoE Keprok citrus. First, the local government plans to impose retribution on marketed outside TTS. This may put SoE Keprok to higher price level and lessen the competitiveness of the commodity. The proposed tax for Keprok is 3% of its selling price.

Second, there is plan from central government to reduce fuel subsidy from 33% to 22%. The reduction of fuel subsidy will bring about the increasing of transportation cost up to 11%. Since the main markets of SoE Keprok is Kupang, Bali and Surabaya where ground and sea transportation play

important role, the increasing of transportation cost will affect the retail price of SoE Keprok which is in turn will affect its competitiveness.

Third, being one of the members of WTO, Indonesia could not avoid free trade arrangement easily, including in Keprok marketing from other countries that make the competition between SoE Keprok and imported Keprok become heavier. According to WTO file about Agreement on Agriculture (AoA), the maximum protection level for fruit (including Keprok) is as much as 19%. The current condition, government puts 16% import tariff for imported Keprok.

The study has two objectives:

1. To determine the competitiveness of SoE Keprok Citrus farming under current policy i.e.: 0% local taxes, 33% fuel price-subsidy and 16% import tariff.
2. To determine the impact of policy changes because of imposition of 3% local taxes (retribution), reduction of fuel subsidy up to 22% (or 11% transportation cost increase) and the 12% import protection toward the competitiveness of SoE Keprok Citrus farming.

II. RESEARCH METHODOLOGY

The method used to evaluate and measure the effect of government policy on SoE Keprok Citrus farming in TTS is the Policy Analysis Matrix (PAM) (Monke et al, 1989 and Pearson, ell, 2003). The methodology is based on the formulation of budget for representative activities such as farming, processing and marketing that can compete on agriculture commodity system. The principle strength of the method is its

ability to measure economic efficiency and its divergences caused by distorting policies and/or market failure.

The PAM method has been widely used to analyze many agricultural commodities, and in Nusa Tenggara Timur had been used for soybean valuation (Wiendiyati, et al, 2003). It is, however, that the method is first used to analyze SoE *Kepron* Citrus production, here in TTS regency in Nusa Tenggara Timur. The main differences in formulating soybean PAM and SoE *Kepron* Citrus PAM occurs is the application of Net Present Value on computing budget for SoE *Kepron* Citrus farming because soybean is a perennial crop while SoE *Kepron* Citrus is an annual crop. This means that SoE could yield fruit for several years and because it produces in multiyear system, the time value of money needs to be put into consideration.

There were three villages were chosen from North Molo sub-district as study sites in Timor Tengah Selatan considering SoE *Kepron* Citrus production, namely, Tobu, Netpala, and Ajaobaki. Disproportional sampling method was applied to choose 30 farmers for each village. All SoE *Kepron* Citrus farming was chosen in monoculture system, since government has launched SoE *Kepron* Citrus development project that encourage farmers to run monoculture system.

Computing social price for land, SoE Sweet Oranges was chosen as the second best plant next to SoE *Kepron* Citrus to utilize the land. Because of SoE *Kepron* Citrus and SoE sweet-oranges are annual crops, its yields vary between years where it follows a production function curve; there are years of no yields, years of slow yield, years of increasing yield, years of maximum yield and year declining yield. Data was grouped regarding the planting year or age of the plant in order to cover yield development from year to year so that its development can be understood.

Data collection incorporates field interviews and literature studies. There are several types of data that were collected in order to construct the PAM. Below are some descriptions:

1. Macroeconomic assumptions on exchange rate and inflation rate were explored using secondary data review.
2. Macroeconomic assumption on nominal and social interest rate were explored using face-to-face interview with farmers and validated with officers that work on SoE *Kepron* project.
3. Input-output were derived from farming survey toward the farmer samples in Tobu, Netpala and Ajaobaki.

4. Parity of tradable input and output (fertilizer, pesticide, fruit of *Kepron*) were derived from trading data starting from the farmer's gate to the export/import location. International prices on F.O.B and C.I.F. were collected from www.worldbank.org/prospects and www.fao.org.
5. Social prices for domestic factors were derived from interview and literature study on labor movement and access of farmers to credit institution.

Data exploration were carried out using semi-structured questionnaires where the input-output and prices from farming activities will be determined. Three PAMs were developed, one for each area considering that each area has had its unique productivity pattern that may reflects differences in soil fertility, climatic condition and farming behavior in each village.

All data then were used for PAM development. A 30-year analytical framework was used considering the production years of SoE *Kepron* Citrus. Aside from that, the 30-year framework is viewed as a limit in present valuing the cash flow in farming because if it exceeds 30 years, the discounted value is certainly small.

To overcome some production data of SoE *Kepron* citrus that were not available during the data gathering, exponential production function was used to predict those data using the existing data. Exponential production function was formulated as follows,

$$Y = \exp(a + bX + cX^2)$$

$$\ln Y = a + bX + cX^2$$

where:

Y = production ;

X = age of the plant.

The input-output then multiplied by the private prices for respective items to produce private budgets; and multiplied by the social prices for respective items to produce social budgets, except for social cost of land that were constructed from alternative crops namely SoE sweet-oranges. The value from each cell of budgets were discounted using real private discount rate to produce a present value or cash-today equivalent amount of money.

The NPV were counted using the equation below:

$$NPV = \sum_{i=1}^n \frac{CF_i}{(1+r)^t}$$

where :

NPV : net present value, the value today for expected cash flow in the future;

CF_i : cash flow of each period (year), where i stretched from 1 to maximum 30.
 r : real interest rate, per annum
 t : period of cash flow, equal to age of plant.

The discounted value for all inputs and output was placed into PAM table as follows.

Table 1. NPV PAM of SoE *Kepron*

	Revenue	Tradable	Domestic Factors			Profit	
			Capital	Labor	Land		
Private	A	B	C	D	E	F	G=A-(B+F)
Social	H	I	J	K	L	M	N=H-(I+M)
Divergences	A-H	B-I	C-J	D-K	E-L	F-M	G-N

Source : Monke, et all, 1989.

The first row presented the private value of revenue, tradable inputs, domestic factors and profit; while the second row presented the social value of revenue, tradable inputs, domestic factors and profit accordingly. The third row is the divergences between private minus social value of each item, where this divergences need to be investigated more whether there were market failure, policy distortion or data failure.

After the current condition had been accommodated on the PAM and the competitiveness of current farming were determined, scenarios on government policy regarding the imposition of 3% local taxes (retribution), reduction of fuel subsidy up to 22% (or 11% transportation cost increase) and 12% import protection were evaluated to understand the level of changing that may happened toward the competitiveness of SoE *Kepron*.

III. RESULT AND ANALYSIS

A. Input-Output Analysis

1. Output Analysis

SoE *Kepron* Citrus yield was recorded at farm's level for each year group. Those yields represent technical level of SoE *Kepron* Citrus cultivation, climate and soil fertility condition for each village. Since those data were not complete for each production year to meet the need of analysis, the existing data was used to be analyzed to estimate SoE *Kepron* Citrus yield for each year using exponential production function.

The estimated exponential production function for each village, as follows :

Tobu:

$$\ln Y = -0.6498 + 0.5807 X - 0.0209 X^2, \text{ with } R^2 \text{ 0.97}$$

Netpala: $\ln Y = -1.6673 + 0.7717 X - 0.0271 X^2, \text{ with } R^2 \text{ 0.89}$

Ajaobaki: $\ln Y = -0.4492 + 0.3464 X - 0.0101 X^2, \text{ with } R^2 \text{ 0.95}$

Using those equations, the yield of SoE *Kepron* in each village can be estimated in every year starting from year 3 to year 30. Then per ha yield is the product of per plat yield and number of plat per ha in each village.

Based on the estimated data shows that in Tobu and Netpala, the maximum yield is reached at 14th years, while in Ajaobaki in 17th years. Estimation result also showed that SoE *Kepron* productivity in Ajaobaki is lower than *Kepron* productivity in two other villages, but its yielding period is longer.

2. Input Analysis

The cost of running *Kepron* farming in Tobu, Netpala and Fatumnasi can be divided into two categories: investments and operational expenditure. In all villages investment takes place in form of land, seedling and cost of care before year 3 when three started to produce yield. In Netpala and Ajaobaki all cost are paid by farmers, meanwhile in Tobu where government run the OECF project, the cost for seedling, composite fertilizer and pesticide are paid by the project. Beside composite fertilizer provided by OECF project, farmers also use organic fertilizer

B. Macroeconomic Assumptions

Macroeconomic assumption covers private and social interest rate as well as exchange rate. Interest rate used are real rate interest rate to accommodate the inflation rate (6%pa). Meanwhile the exchange rate used is the mode of year 2003 and the middle of prediction rate for 2004. The values of the parameters are presented in Table 2.

C. Price Analysis

The social price of SoE *Kepron* was derived using C.I.F. Paris for Mediterranean Mandarin orange. This data was provided by The World Bank through its website. The fruits go all the way until it reached the farmers' gate in Tobu, Netpala and Ajaobaki where the competitiveness of SoE *Kepron* is analyzed. Meanwhile, the private price was derived from actual selling price at farmers' gate and added up with policy on import tariff and local tax. The chronology of social price and private price for each village is presented at Table 3.

Table 2. Macroeconomic assumption for citrus farming in TTS

Assumption Table	Rate
Macro-Economic Ass.:	
Nominal private rate (%p.a)=	30
Inflation rate (%p.a)=	6
Real private rate (%p.a) =	22,6
Real social rate (%p.a.)=	16,0
Exchange rate (IDR/USD)=	8500

Source: Farmers' interview and literature

Table 3 informs that the social price differences among villages are caused by differences in distribution cost to farm that are affected by its distance from Kupang and the quality of the road and public transportation. The social price is the highest in Ajaobaki and is the lowest in Netpala, where this price pattern is conform to its private prices though the private price is lower than its social prices. The price divergences ranged from Rp45/kg (Tobu and Ajaobaki) to Rp434/kg (Netpala).

Table 3. Social price and private price of SoE *Kepron*

	Tobu	Netpala	Ajaobaki
SOCIAL PRICE			
CIF Price (US\$/kg)			
Mediterranean Mandarin Oranges, Paris	668.6	668.6	668.6
Freight and Insurance (US\$/ton), to Surabaya	20.0	20.0	20.0
FOB Price (US\$/ton)	648.6	648.6	648.6
Exchange Rate (Rp/US\$)	8,500.0	8,500.0	8,500.0
CIF Price, at Surabaya port (Rp/kg)	5,513.2	5,513.2	5,513.2
Transportation and handling (Rp/kg): Surabaya port - Kupang port	225.0	225.0	225.0
Parity price at wholesale (Rp/kg)	5,288.2	5,288.2	5,288.2
Distribution cost to farm (Rp/kg)	500.0	835.0	350.0
Social price at farm-gate (Rp/kg)	4,788.2	4,453.2	4,938.2
PRIVATE PRICE			
Selling Price (Rp/kg)	3861.0	3137.0	4011.0
Import Tariff 16% of CIF (Rp/kg)	882.1	882.1	882.1
Local tax 0% of selling price (Rp/kg)	0.0	0.0	0.0
Private Price (Rp/kg)	4743.1	4019.1	4893.1
DIVERGENCES IN PRICES: PRIVATE MINUS SOCIAL PRICE			
	-45.1	-434.1	-45.1

Source: Data analysis from www.worldbank.org, farmers' interview and literature study

D. Policy Analysis for SoE *Kepron* Citrus Farming in Tobu

Items that appear on PAM are revenue, domestic factors and profit. After careful investigation we found out that all inputs such as seedlings, fertilizer and pesticide are not the kind of tradable input for international market; those only produce and sold for domestic market. The California pulp and sulphur are not branded items but a "borrowed name", both mixed up to make pesticide solution to be applied on the skin of the tree. So there is not any item that fit the category for tradable input, making this category left behind on analysis. The PAM for *Kepron* citrus farming in Tobu is presented in Table 4. The table informs that there is exist divergences in revenue, domestic input, land, capital, total of domestic factor and profit. Avoiding tradable input, labor is the only item that shows no divergence

Table 4. Present valued PAM for SoE *Kepron* citrus farming in Tobu

	Revenue	Tradable Input	Domestic Factor	
			Input	Labor
Private	55.265.832	0	1.373.411	8.060.337
Social	55.790.212	0	4.100.557	8.060.337
Divergence	(524.380)	0	(2.727.146)	-
Profit				
	Domestic Factor			Profit
	Land	Capital	Total	
Private	15.000.000	2.135.943	26.569.690	28.696.142
Social	22.540.427	1.509.400	36.210.720	19.579.492
Divergence	(7.540.427)	626.543	(9.641.030)	9.116.650

Source : Primary data

The selling price of output on farmers' gate is Rp 3,861 /kg, while the international parity at the farmer's gate is Rp 4,788.1/kg. With 16% import tariff (Rp.882.1/kg) and 0% local tax, the private price became Rp4,743.1/kg (from Rp3,861.0/kg + Rp882.1/kg). So, there does exist Rp45.1/kg divergences between private price and social price. We could not find out any form of policy distortion or market failure that can explain this divergence. So, we view this divergence as additional profit gained by wholesalers that attract them to stay in the business considering some business risk involves in the citrus trading.

As mentioned before, input receives "treatment" from the government through the OECF project that covers seedling, composite

fertilizer and pesticide. This subsidy creates social burden which present valued at Rp2,825,635 per ha of cultivation area. With 500 ha development area in Tobu and surrounding areas, the total social burden became Rp 1,412,817,500

Labor have not any divergence between private and social budget because even there is no restriction on labor movement, the farmers have had no opportunity to work outside the farming on non-harvest time such as being a factory workers or so on. One or two farmers have had secondary-job as village or *kampong* heads but this is not a general case. Moreover this kind of side job seems to be tightly related to cultural aspect of the farmers as members of the clans where each member maintain almost a permanent status as long as he/she lives. One cannot move into head position easily, so we perceive that there is no alternative of doing other jobs among the farmers. This situation put the farmers into a total dependency toward farming activities. Lack of access and interaction with outsiders has potential on making industrialization difficult to be adopted though there had been many government initiative projects on agro-industrial improvement.

In Timor Tengah Selatan (SoE), pricing land for private value is complicated because there is exist a social agreement on not letting any outsiders to own land except if the outsider married to someone belong to the clan. We construct the land price for 30 years as investment cost after having some "insider" information that the price of land is about Rp15,000,000/ha for the member of the clan. This means that in our analysis we still view Tobu as a "closed area", farmers are clan-members only. The social price of land was constructed from the social profit without land of SoE sweet-orange farming since this plant is the closest substitute or alternative toward the SoE *Kepron* citrus. For a 30-year analysis, the social profit without land for SoE sweet-orange farming is Rp. 22,540,427 /ha (See Appendix 2 for details). With social cost of land at Rp. 22,540,427 /ha, the private budget becomes Rp. 7,540,427/ha lower than its social budget. This divergence partly may ignite by of the traditional law that prohibits land market to exist freely. Also, this could be viewed as management fee or incentive on running the sweet-orange farming.

There has not any lending institution existing in Tobu Village yet. There is exist two farmer-workgroups under the OECF Project but the group manages labor sharing among its members only and have not yet move into financial aspect such as providing

low-rate capital. Sometimes farmers receives down payment for prospective buyers namely "ijon" upon the agreement that the farmer owe the buyer for certain trees of *Kepron*. Farmers we interviewed could not give any cue of his/her return expectation, so we use data from "informal" lending to approach the private rate. According to some information, the rate for private lending in villages in Timor Tengah Selatan is usually around 30%pa and sometimes may jump up to 42%pa; so we use nominal private rate 30% pa, meanwhile for social rate we use 23% pa which is the average bank rate in NTT. With an annual inflation 12%, the real private rate became 16.1% pa, while the real social rate became 9.8% pa. This 6.3%pa divergence in rate of working capital creates Rp. 626,543 /ha divergences for 30-year analysis. If there is exist a lending institution that can provide capital with 9.1%pa real rate, the whole farmers that cover the 500 ha area can save money for Rp.393,485,500. The amount of money is a big saving to the community and equals to profit of 6.24 ha of SoE *Kepron* farming for 30 years.

The performance of *Kepron* Citrus farming in term of competitiveness is measured using PCR and DRC. The PCR of the farming is 0,4808, means that to create Rp.1 equivalent foreign currency takes only Rp. 0,4808 domestic input. Because the domestic input used is lower than the foreign currency it creates, the farming is viewed as having a competitive advantage. In the absence of policy the DRC is 0,6491, means that to create Rp.1 equivalent foreign currency takes only Rp. 0,6491 domestic input. From the PCR and DRC value, we conclude that the *Kepron* citrus farming can survive without any subsidy from government provided that farmers have had enough money on starting the farming to cover up with investment and operational expenditure up to year 8th where the cumulative PV profit become positive for the first time.

The initial condition of the analysis is 16% tariff import, 33% fuel subsidy and 0% local tax or retribution. As explained in the beginning of the report, the second objective of the research is to determine the competitiveness of SoE-Citrus under changing policies where import tariff slowly decrease to 12%, fuel subsidy decrease to 22% that ignite the transportation cost to jump up 11% and a local selling tax 3% is applied. Later on, the zero import tariff condition will be used to analyze the competitiveness of the farming provided that the tendency toward tariff-less can become a global agreement.

When tariff decreases to 12%, fuel subsidy reduced to 22% and a 3% local tax is applied (Changes1), Figure 3 informs that there are small decreases in private revenue (Rp. 1,384,306 /ha) and there is an increasing in social revenue (Rp. 34,478,494/ha) but does not change private and social cost so it will automatically reduce the private profit and social profit of the farming. But, the private profit itself still has positive sign, means that the farming can still maintain its competitiveness.

E. Policy Analysis for SoE *Kepron* Citrus Farming in Netpala

Similar to Tobu case, in Netpala there is no input that fit the tradable inputs category. The PAM for *Kepron* citrus farming in Netpala is presented in Table 5. The table informs that there is exist divergences in revenue, land, capital, total of domestic factors and profit.

Table 5. Present valued PAM for SoE *Kepron* Citrus Farming in Netpala

	Revenue	Tradable Input	Domestic Factors		
			Input	Labor	Land
Private	38.042.354	0	3.773.228	7.633.579	24.000.000
Social	42.150.774	0	3.773.228	7.633.579	34.239.903
Divergence	-4.108.420	0	0	0	-10.239.903

	Domestic Factors			Profit
	Land	Capital	Total	
Private	24.000.000	2.577.939	37.984.746	57.607
Social	34.239.903	1.825.089	47.471.800	-5.321.026
Divergence	-10.239.903	752.849	-9.487.054	5.378.633

Source: Primary data

The selling price of output on farmers' gate in Netpala is Rp3,137.0/kg, while the international parity at the farmer's gate is Rp4,453.1/kg. With 16% import tariff (Rp.882.1/kg) and 0% local tax, the private price became Rp4,019.1/kg (from Rp3,137.0/kg + Rp882.1/kg). So, there does exist Rp434.1/kg divergences between private price and social price. This value is much higher than Tobu and Ajaobaki (only Rp45/kg and). There is no indication of policy distortion or market failure that can explain this divergence, but probably there is the effect of bad transportation to the farming center that cause inequality in transportation cost where from Kupang to Netpala it needs Rp835/kg, from Kupang to Tobu Rp500/kg and from Kupang to Ajaobaki Rp.350/kg.

Labor have not any divergence between private and social budget because even there is no restriction on labor movement, the farmers have had no opportunity to work outside the farming on non-harvest time such as being a factory workers or so on. This condition is similar to Tobu where access to off farm work does not exist.

As a general case in Timor Tengah Selatan (SoE), pricing land for private value is complicated because there is exist a social agreement on not letting any outsiders to own land except if the outsider married to someone belong to the clan. The private price of land is estimated Rp.24,000,000/ha The social price of land was constructed from the social profit without land of sweet-orange farming in Netpala since this plant is the closest substitute or alternative toward the SoE *Kepron* citrus. For a 30-year analysis, the social profit without land for sweet-orange farming is Rp. 34,239,903 /ha (See Appendix 4 for details). With social cost of land at Rp. 34,239,903 /ha, the private budget becomes Rp. 10,239,903/ha lower than its social budget. This divergence partly ignited by traditional law or vow or agreement that prohibited land market. Also, this could be viewed as management fee or incentive on running the sweet-orange farming. This figure is higher for Netpala compares to Tobu because intensity of sweet orange farming in Netpala is heavier than Tobu, as so far Netpala is well known as pioneer in sweet orange farming in TTS.

We assign the similar level of real interest rate between Tobu, Netpala and Ajaobaki, either private rate or social rate, considering that the financial and macro condition for neighborhood area are reasonable similar.

The performance of *Kepron* Citrus farming in term of competitiveness is measured using PCR and DRC. The PCR of the farming is 0.9985, means that to create Rp.1 equivalent foreign currency takes only Rp. 0.9985 domestic input. Because the domestic input used is lower than the foreign currency it creates, the farming is viewed as having a competitive advantage. In the absence of policy the DRC is 1,1262, means that to create Rp.1 equivalent foreign currency takes only Rp. 1,1262 domestic input. From the PCR and DRC value, we conclude that the *Kepron* citrus farming have had competitive but it does not have comparative advantages.

When tariff decreases to 12%, fuel subsidy reduced to 22% and a 3% local tax is applied, there are small decreases in private revenue (Rp. 1,196,634/ha) and social revenue (Rp. 1,104,148/ha) but does not change private

and social cost so it will automatically reduce the private profit and social profit of the farming. Meanwhile, the private profit itself still has positive sign, means that the farming can still maintain its competitiveness.

F. Policy Analysis for *Kepron* Farming in Ajaobaki

Similar to Tobu and Netpala case, in Ajaobaki also there is no input that fit the tradable inputs category. The PAM for *Kepron* citrus farming in Ajaobaki is presented in Table 6. The table informs that there is exist divergences in revenue, land, capital, total of domestic factors and profit.

The selling price of output on farmers' gate in Ajaobaki is Rp4,011.0/kg, while the international parity at the farmer's gate is Rp4,938.2/kg. With 16% import tariff (Rp.882.1/kg) and 0% local tax, the private price became Rp4,893.1/kg (from Rp4,011.0/kg + Rp882.1/kg). So, there does exist Rp45/kg divergences between private price and social price. This value is similar to Tobu, but much lower compares to Netpala. After incorporating the import tariff, we still find no indication of policy distortion or market failure that can explain this divergence between private and social revenue.

Similar to the first two villages (Tobu and Netpala), labor budget in Ajaobaki have Ajaobaki. The social price of land was constructed from the social profit without land of sweet-orange farming in Ajaobaki, which is Rp. 11,352,977 /ha (See Appendix 6 for details). This value is the lowest compares to social cost of land in Netpala (Rp 34,239,903/ha) and Tobu (Rp. 22,540,427/ha), means that so far the profit generated by sweet oranges farming in Ajaobaki is not good enough to cover up with the land cost.

Table 6. Present valued PAM for SoE *Kepron* citrus farming in Ajaobaki

Items	Revenue	Trade- ble Input	DomestikFactor	
			Input	Labor
Private	21.735.400	0	3.503.538	3.576.537
Social	33.029.162	0	5.145.800	4.705.693
Diver- gence	-11.293.762	0	-1.642.262	-1.129.156

Items	DomestikFactor			Profit
	Land	Capital	Total	
Private	16.000.000	1.603.036	24.683.110	-2.947.711
Social	11.352.977	1.576.239	22.780.708	10.248.453
Diver- gence	4.647.023	26.797	1.902.402	-13.196.164

Source: Primary data

As mentioned before, we assign the similar level of real interest rate between Tobu, Netpala and Ajaobaki, either private rate or social rate, considering that the financial and macro condition for neighborhood area are reasonable similar.

The performance of *Kepron* Citrus farming in term of competitiveness is measured using PCR and DRC. The PCR of the farming is 1.14, means that to create Rp.1 equivalent foreign currency takes Rp. 1.14 domestic input. Because the domestic input used is greater than the foreign currency it creates, the farming does not have a competitive advantage. In the absence of policy the DRC is 0.69, means that to create Rp.1 equivalent foreign currency takes only Rp. 0.69 domestic input. From the PCR and DRC value, we conclude that the *Kepron* citrus farming does not have competitive advantages but it does have comparative advantages.

When tariff decreases to 12%, fuel subsidy reduced to 22% and a 3% local tax is applied (Changes1), there are small decreases in private revenue (Rp. 445,067/ha) and social revenue (Rp. 423,056/ha) but does not change private and social cost so it will automatically reduce the private profit and social profit of the farming. Meanwhile, the private profit itself still has positive sign, means that the farming can still maintain its competitiveness.

IV. CONCLUSION

1. From profit level, PCR, DRC, PC and SRP values it is determined that SoE *Kepron* Citrus is profitable under current policy (16% import tariff, 33% fuel subsidy and 0% local tax). The current private and social profitability of SoE *Kepron* citrus means that this commodity might warrant more government research.
2. The policy changes (12% import tariff, 22% fuel subsidy and 3% local tax) will reduce the private profit for 16%, but the farming can still manage its competitiveness. If the tariff eliminated, the private profit will drop for 29% and proactive steps on better farming management should be improved before this changes occur. Though it can become encouraging factor for farmers on farming area development, the seedling gratis distribution alone is not a good solution on increasing the competitiveness of SoE *Kepron* Citrus.
3. Policy on better land and labor utilization should be explored since the working hour devoted for SoE *Kepron* Citrus farming and the productivity are relatively low.

REFERENCES

- Dinas Pertanian Tanaman Pangan dan Hortikultura Kabupaten Timor Tengah Selatan. Laporan tahunan bagian proyek pengembangan agribisnis jeruk Kabupaten Timor Tengah Selatan Tahun Anggaran 2002. SoE, Timor Tengah Selatan.
- Monke, E.A. and S.R. Pearson. 1989. The policy analysis matrix for agricultural development. Cornell University, Ithaca.
- Pearson, S., C. Gotsch and S. Bahri. 2003. Aplikasi policy analysis matrix pada pertanian Indonesia. www.macroffodpolicy.com
- Wiendiyati and U.R. Raya. 2003. Policy analysis matrix (pam) on the impact of government policy toward the competitive advantages of soybean farming in Ngada Regency, Nusa Tenggara Timur. Presented at The 5th Indonesian Regional Science Association (IRSA) International Conference. July 18 – 19, 2003, Bandung Indonesia.

Appendix

Table 1. The per plant yield of SoE *Kepron* based on the age of plant

Age (Year)	Yield per plant (kg)								
	Tobu			Netpala			Ajaobaki		
	Ave	Min	Max.	Aver	Min	Max	Ave-	Min	Max
3	3.0	0.0	4.0	3.0	0.0	3.5	1.2	0.0	2.0
4	3.0	2.0	4.5	3.0	1.5	5.0	3.1	1.5	4.0
5	n.a	n.a	n.a	4.0	2.5	6.5	n.a	n.a	n.a
10	22.0	16.0	30.0	n.a	n.a	n.a	n.a	n.a	n.a
13	n.a	n.a	n.a	n.a	n.a	n.a	18.3	14.0	20.0
20	n.a	n.a	n.a	20.3	16.5	40.0	13.8	12.5	19.0
22	8.5	6.0	11.0	12.6	8.0	13.5	n.a	n.a	n.a
25	n.a	n.a	n.a	n.a	n.a	n.a	10.9	8.0	13.5

Source: Primary data from farmers' interview (2004). n.a: data not available

Table 2. Yield estimation of SoE *Kepron* citrus plant based on their age in TTS

Age (Year)	Yield (Kg)					
	Tobu		Netpala		Ajaobaki	
	per plant	per ha eq. 300 stands	per plant	Per ha eq. 200 stands	per plant	per ha eq. 178 stands
3	2.47	740.84	1.50	299.51	2.47	434.31
4	3.81	1143.74	2.68	536.01	3.25	572.13
5	5.64	1693.40	4.54	908.67	4.20	738.59
6	8.01	2404.49	7.30	1,459.15	5.31	934.40
7	10.91	3274.30	11.10	2,219.52	6.58	1158.44
8	14.25	4276.08	15.99	3,198.04	8.00	1407.44

Table 2.

Age (Year)	Yield (kg)					
	Tobu		Netpala		Ajaobaki	
	per plant	per ha eq. 300 stands	per plant	Per ha eq. 200 stands	per plant	per ha eq. 178 stands
9	17.85	5355.54	21.82	4,364.89	9.52	1675.72
10	21.44	6432.68	28.22	5,643.25	11.11	1955.18
11	24.70	7409.90	34.56	6,911.15	12.70	2235.58
12	27.29	8185.85	40.09	8,017.45	14.23	2505.00
13	28.91	8672.53	44.05	8,810.23	15.63	2750.68
14	29.37	8811.70	45.85	9,170.73	16.82	2959.98
15	28.62	8586.27	45.21	9,042.45	17.74	3121.42
16	26.75	8023.80	42.23	8,445.65	18.33	3225.75
17	23.97	7190.97	37.36	7,472.15	18.56	3266.82
18	20.60	6180.53	31.31	6,262.15	18.42	3242.16
19	16.98	5094.42	24.86	4,971.26	17.92	3153.25
20	13.42	4027.13	18.69	3,738.30	17.08	3005.37
21	10.18	3053.00	13.31	2,662.86	15.95	2807.07
22	7.40	2219.68	8.98	1,796.75	14.60	2569.35
23	5.16	1547.69	5.74	1,148.39	13.09	2304.67
24	3.45	1034.93	3.48	695.28	11.51	2025.86
25	2.21	663.69	1.99	398.74	9.92	1745.12
26	1.36	408.18	1.08	216.62	8.37	1473.18
27	0.80	240.75	0.56	111.47	6.92	1218.72
28	0.45	136.18	0.27	54.34	5.61	988.02
29	0.25	73.88	0.13	25.09	4.46	784.95
30	0.13	38.43	0.05	10.97	3.47	611.13

Source: Analysis of primary data. Estimation use exponential equation

Table 3. PV of private budgets and social budgets of SoE *Kepron* citrus farming in Tobu for 30-year analysis using 16.1%pa real discount rate

Category	Items	When Used? Who Pays for It?	Private Budget (Rp/ha)	Social Budget (Rp/ha)
Tradable Inputs	(No item under this category)			
Domestic Factors	Seedlings	Year 1, Project	0	750,000
	Fertilizer			
	Composite Fertilizer	Year 1 to 3, Project	0	1,758,833
	Organic Fertilizer	Year 4 to 30, Farmer	1,905,056	1,905,056
	Pesticide			
	Fungicide	Year 1 to 3, Project	0	149,765
	Insecticide	Year 1 to 3, Project	0	74,880
	Herbicide	Year 1 to 3, Project	0	92,158
	California Pulp	Year 4 to 30, every 2 year, Farmer	170,993	170,993
	Sulphur	Year 4 to 30, every 2 year, Farmer	48,855	48,855
	Labor (Rp/ha)			
	Preparation	Year 1, Farmer	223,810	223,810
	Planting	Year 1, Farmer	16,000	16,000
	Crop care	Year 1 to 30, Farmer	8,342,841	8,342,841
	Pruning	Year 3 to 30, Farmer	1,190,235	1,190,235
	Harvesting & Packaging	Year 3 to 30, Farmer	693,753	693,753
	Working capital (Rp/ha)	Year 1 to 30, Farmer	2,023,641	1,236,669
	Land (Rp/ha)	Year 1, Farmer	15,000,000	23,166,628
Total Cost	Total cost (Rp/ha)		29,615,183	39,820,475
Output	Revenue (Rp)	Year 3 to 30	92,635,208	93,514,999
Profitability	Net Profit (Rp/ha)		63,020,025	53,694,524
	B/C Ratio, PV		3.13	2.35

Source: Analysis of primary data.

Table 4. PV of private budgets and social budgets of SoE *Kepron* citrus farming in Netpala for 30-year analysis using 16.1%pa real discount rate

Category	Items	When used? Who pays for it?	Private Budget (Rp/ha)	Social Budget (Rp/ha)
Tradable				
Inputs	(No item)		0	0
	Seedlings	Year 1, Farmer	695,000	695,000
Domestic Factors	Organic Fertilizer	Year 1 To 30, Farmer	2,998,647	2,998,647
	Pesticide	Year 1 To 30, Farmer	1,144,278	1,144,278
	California Pulp	Year 4 To 30 Every 2 Years, Farmer	170,993	170,993
	Sulphur	Year 4 To 40 Every 2 Years, Farmer	48,855	48,855
	Labor:			
	Preparation	Year 1, Farmer	223,810	223,810
	Planting	Year 1, Farmer	16,000	16,000
	Crop care	Year 1 to 30, Farmer	8,342,841	8,342,841
	Pruning	Year 3 to 30, Farmer	738,934	738,934
	Harvesting & packaging	Year 3 To 30, Farmer	563,763	563,763
	Working capital (Rp/ha)	Year 1 to 30, Farmer	2,401,573	1,467,628
	Land	Year 1, Farmer	24,000,000	34,802,533
Total Cost	Total Cost		41,344,693	51,213,281
Output Profitability	Revenue	Year 3 to 30	66,603,494	73,796,402
	Net Profit (Rp/ha)		25,258,801	22,583,121
	B/C Ratio, PV		1.61	1.44

Source: Analysis of primary data. See Table 3 for details