Comparative Advantage of Siamese Orange (*Citrus Nobilis*) Farming in District of 50 City, West Sumatera

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ABSTRACT : *Citrus Nobilis*, known as Siamese Orange, is one of the strategic fruits commodities for West Sumatera because of its high productivity, approximately 6 - 9 tons per hectare. However, this commodity faces a fluctuated demand both in domestic and international markets. This is a serious problem due to its impact on farm income as well as in its comparative advantage. The aim of this study was to analyze the comparative advantage level of siamese orange farming. Eighty four Siamese Orange farmers are selected using simple random sampling to get orange farming data. The comparative advantage level is measured with Policy Analysis Matrix (PAM) approach. The results show that siamaese orange farming has a high comparative advantage, indicating by more than zero value of social profitability and less than one domestic resource cost ratio. This comparative advantage could be sustained if domestic resources are efficiently utilized through the improvement of labor skills and the use of Siamaese Orange farming modern technology.

Keywords: Comparative advantage, siamese orange farming, PAM

INTRODUCTION

Siamese Orange is the main local commodity of Lima Puluh Kota District, with productivity range from 6 to 9 tons/ha and total land area of 570.89 ha in Gunung Omeh Sub district (Dinas Pertanian Sumbar, 2015). Siamese Orange production in this area is marketed to Sumatra, Java and abroad such as Malaysia. The current transportation infrastructure has facilitated the flow of Siamese Orange to Padang City through Teluk Bayur Port and Minangkabau International Airport. However, in 2006–2015, the export of Siamese Orange decreased due to the unstable economic condition. Meanwhile, the competition in the global horticultural commodity market is getting tighter, which in turn affects the competitiveness of Siamese orange produced in Gunung Omeh sub district. Those Impact on small niche market occupation and farm income

Farming competitiveness is defined as the ability of producers to produce a commodity with a relatively low cost so that prices in the international market is profitable (Novianti, 2003). The commodity competitiveness can be measured with the comparative advantage indicators, such as the labor and land productivity. According to the Asian Development Bank (1992 in Aprizal, 2013), the comparative advantage is the ability of a region to produce with a relatively low cost. Comparative advantage can also be measured with the social value of cost of production by using the shadow price of input and output. Dewanata (2011) shows that exchange rate changes have greater effect on the Siamese Oranges with modern technology than that with traditional technology in Garut

Regency. In addition exchange rate, output price, and price of subsidized fertilizer also significantly influence impact farm profit. The results of Wiji (2007) indicate that the Siamese farming system in Pontianak is highly competitive so that it's commodity produce can compete in the international market and be able to finance its domestic cost. Sayekti (2011) and Husaini (2012) also concluded that Siamese Orange farming has both competitive and comparative advantages.

This study focuses on the comparative advantage of Siamese orange farming in the highlands compared to previous researchs which analyzed the comparative competitiveness of Siam Orange Farming in lowland and Agroclimate Differences (Husaini, 2010), Differences in Production Technology (Dewanata, 2011), and Feasibility and Competitiveness business. This study aims to analyze the comparative competitiveness of Siamese Orange Farming in Kanagarian Koto Tinggi District of Gunung Omeh Disctrict of 50 Kota West Sumatera. The results of this study are expected to provide an overview of Siamese Orange farming competitiveness for decision makig in order to design policies for Siamese orange agribusiness development in Kanagarian Koto Tinggi District of Gunung Omeh District of 50 Kota West Barat.

RESEARCH METHODS

This research was conducted in Kanagarian Koto Tinggi of Gunung Omeh Sub-district, Lima Puluh City, West Sumatera Province, which is the largest production center of Siamese Orange. 84 Siamese Orange farmers are selected using Simple Random Sampling to collect data on farm cost, production quantity and selling price, fertilizer distribution cost, export, the shadow price of input and output. Assumptions used in the analysis include: (a) Rp 13.450 of USD-IDR, (b) 6.28% of inflation rate, and (c) 12.5% of interest rate. Input and output are set at two types of

price, namely private price and shadow price. The private price is determined at the output market price or the price of the paid production inputs. The shadow price, according to Gitingger (1986), is the inputs' and outputs' prices that occur in the perfectly competitive market and equilibrium condition. The price is determined on the basis of prevailing market prices. The shadow price of the tradable production inputs equals the shadow output price, i.e., the FOB (Free On Board) price and for the imported commodities using the CIF (Cost Insurance Freight) price. The shadow price of non-tradable production inputs using the prevailing domestic price in the research area.

Data analysis method used is Policy Analysis Matrix (PAM) (Monke and Pearson, 1989; 2003). The PAM model has also been applied to analyse the profitability and competitiveness of Bengkulu Lobster, by Sukiyono (2011). The comparative competitiveness from private profits and the ratio of private costs with PAM Model can be calculated as follows:

Table 1. Comparative advantage calculation with PAM Model

Decription	Revenue	Costs		Profits
		Tradable	Non-tradable	
Private Price	A	B	C	D
Social Price	E	F	G	H
Divergence	I = A-E	J=B-F	K=C-G	L=I-J-K

Sumber : Monke and Pearson, 1989

where is: (A) farm revenue based on private price, (E) revenue based on social price, (I) output transfers, (B) tradable input cost based on private price, (F) tradable input cost based on social price, (J) input transfers, (C) domestic input cost based on market price, (G) domestic input cost based on social price, (K) factor transfers, (D) private profits, (H) social profits, (L) net transfers.

The criteria of comparative advantage of Siam Gunung Omeh citrus farming are:

1. Social Profit (SP) i.e., H = E - (F + G). Social profit is an indicator of comparative advantage. If H> 0 then the farm is worth

developing. Conversely, if H ≤ 0, it means that commodities cannot compete without or intervene by the government.

2. Domestic Resource Cost Ratio (DRCR). If DRCR <1, then the commodity system has a comparative advantage, which means the commodity exploitation has an efficient. Conversely, if DRCR ≥1, the commodity system does not have a comparative advantage, meaning that commodity exploitation does not have efficiency

RESULTS AND DISCUSSION

The results show that tradable input costs are greater than those of non-tradable. Tradable input costs are dominated by the cost of importing fertilizers, pesticides, and fuels, while non-tradable inputs are dominated by labor, land and local fertilizers. Labor inputs are low mobility due to its local skills. The study also indicates that the input market of Siamese orange production in research area connects to output and input international market as an example pesticide is an importing inputs from multinational company. Their market covers all agricultural countries all over the world, and the product price is also dollars standards. Since, the price of product when It was imported to Indonesia based on the CIF (Cost Insurance Freight) price as presented in Appendix 1.

The comparative competitiveness of orange farming system in the global market or not can be examined from the structure of tradable and non-tradable input costs. The PAM results indicated that orange farming in Kanagarian Koto Tinggi, has a comparative advantage characterized by Domestic Resource Cost Ratio (DRCR) and Social Profits (PS) as presented in Table 1.

The DRCR value of Siamese Orange Farm in Kanagarian Koto Tinggi is 0.11. The value indicates that to profit US$100, farmers must spend the cost for domestic resource approxemately US $ 11. In terms of trade in the international market, the 0.11 value of DRCR indicates the high comparative advantage (0 to ≤ 1) of Siamese orange farming. The lower the DRCR value, the higher the comparative advantage of the Siamese orange farm in Kanagarian Koto Tinggi. This result also informs that this farming is able to survive even without government intervention. The reason is that this farming has the necessary domestic resources (i.e. land) for its development. The high comparative advantage is supported by suitable land and climate conditions for orange farming and the abundance of labour for a more efficient utilization of domestic resources. This value also indicates that efficiency of domestic resources used (i.e. labour and fertilizers) will have a comparative advantage. This conclusion is also supported by the value of PS, i.e., Rp 439,166,360/Ha/Year. The social profits (PS) are gained in perfectly competitive markets, when there is no government policy intervention and market failures in the form of subsidies on production inputs, particularly production of tradable inputs.

The comparative advantage of Siamese Orange in Kanagarian Koto Tinggi is higher than the Garut Orange (Dewanata,2011), the Pontianak Siamese Orange (Wiji, 2007), and Sambas Siamese Orange with DRCR 0.70, 0.17 and 0.15, respectively.

Tabel 2. Comparative advantage of siamese orange

Decription	Farm revenue (Rp)	Input Costs (Rp)		Profits (Rp)
		Tradable	Non Tradable	
Private Price	279,747,024	87,810,597	38,272,566	153,663,861
Social Price	591,479,722	100,084,882	52,228,480	439,166,360
Policy Impacts	(311,732,698)	(12,274,285)	(13,955,914)	(285,502,499)
PS				439,166,360
DRCR				0,11

However, the Siamese orange comparative advantage in Kanagarian Koto Tinggi is lower than those in Jember Regency , in which DRCR only 0.05. Orange farmers in Jember District allocate and utilize domestic resources more efficiently.

In general, the comparative advantage of Siamese orange farming in Kanagarian Koto Tinggi is higher, as also found in a number of orange centres in Indonesia. This high comparative advantage is due to the abundance of domestic resources, particularly non-tradable inputs such as labour, land, and suitable agro-climate. However, the efficiency of domestic resources such as labour and land needs to be improved. This is to anticipate the increase of labor cost and land rent in Kanagarian Koto Tinggi due to competition of labour and land use with other commodity farming (Romdhon, 2004). Efforts can be done by improving management skills of Koto Tinggi's Siamese orange farmers. The introduction of modern technology in Siamese orange farming in Jember District could improve competitiveness of Siamese orange. The support of farming infrastructure (farm road) can also optimize efficiency of domestic resource utilization so the cost of input and output transport can be minimized. Farmers can directly deliver their products to large collectors or exporters, so they can gain a maximum of twice the profit gained today. This effort will increase Siamese orange export, as the competitiveness of Indonesian orange exports compared to three ASEAN countries (Malaysia, Philippines, and Thailand), is lower in the international market (Hanani, 2009).

POLICY IMPLICATIONS

Siamese Orange farming system in Kanagarian Koto Tinggi has a high comparative advantage and efficiency in domestic resources utilization as indicated by the private profits and social benefits. The policy should be implemented for sustaining the comparative advantage was the improvement of labor skills, and the use of postharvest modern technology.

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Appendix 1. Private and economic analyses of Citrus Nobilis Farming at Kanagarian Koto Tinggi-West Sumatera

Description	unit	Volume	Mean per ha	Private (Rp)		Social (Rp)	
				Price	cost	price	cost
Output	Kg	1,563,333	18,611	15,030	79,747,024	31,781	591,479,722
Input Tradable							
Urea	Kg	50,070	596	5,000	9,075,902	5,386	9,784,239
TSP	Kg	40,404	481	7,500	10,789,637	10,623	15,450,724
KCl	Kg	48,811	581	15,000	25,714,107	16,727	29,043,433
Za	Kg	42,529	506	5,000	7,392,798	6,265	9,440,341
Ponska	Kg	36,993	440	2,952	4,613,226	6,265	7,029,100
NPK Mutiara	Kg	28,209	336	2,500	5,323,274	7,260	3,831,243
Pesticide							
Alika	Litre	36	0	519,881	5,258,520	519,881	5,258,520
Score	Litre	19	0	667,679	3,927,752	667,679	3,927,752
Marshal	Litre	6	0	47,560	279,629	47,560	279,629
Atonik	Litre	3	0	26,190	78,952	26,190	78,952
Agrimax	Kg	4	0	496,429	1,813,810	496,429	1,813,810
Lanate	Kg	131	2	177,321	8,780,886	177,321	8,780,886
Sinon 45	Kg	76	1	109,268	3,170,867	109,268	3,170,867
gasoline	Litre	633	8	8,000	1,591,238	10,800	2,195,387
Total Tradable cost		247,925	2,951	2,090,280	87,810,597	2,107,653	100,084,882
Input Non Tradable							
Seed	stem	21,300	254	-	-	12,000	4,800,000
Organ.Fertilizer	Kg	2,085,333	24,825	249	6,349,206	249	6,349,206
Family labour							
Fertilization	day	902	11	50,357	2,589,747	50,357	2,589,747
Weeding	day	977	12	58,215	4,032,889	58,215	4,032,889
Spraying	day	413	5	50,238	9,445,595	50,238	9,445,595
Harvest	day	186	2	50,000	3,636,190	50,000	3,636,190
Maintenance	day	123	1	31,548	1,827,560	31,548	1,827,560
Non-family labour							
Fertilization	day	269	3	50,357	936,146	50,357	936,146
Weeding	day	233	3	54,583	1,159,457	54,583	1,159,457
Spraying	day	100	1	50,357	3,244,357	50,357	3,244,357
Harvest	day	90	1	50,119	1,858,937	50,119	1,858,937
Maintenance	day	79	1	46,548	1,284,381	46,548	1,284,381
Hoe	Unit	133	2	47,798	59,482	47,798	59,482
Cleaver	Unit	85	1	38,690	36,780	38,690	36,780
Handsprayer	Unit	88	1	319,464	210,617	319,464	210,617
Scissor	Unit	267	3	51,429	166,090	51,429	166,090
Basket	Unit	262	3	106,071	137,500	106,071	137,500
Kibang	Unit	288	3	54,167	57,442	54,167	57,442
Drum	Unit	106	1	140,952	112,880	140,952	112,880
Grass-cutting machine	Unit	54	1	683,333	287,411	683,333	287,411
Sancin	Unit	41	0	2,283,333	697,161	2,283,333	697,161
fruit basket	Unit	287	3	102,738	35,465	102,738	35,465
Scoop	Unit	77	1	11,268	9,212	11,268	9,212
Land	Hectare	1	2			14,687,500	9,255,319
Tax	year	53	1	5,031	99,405	-	
Total Non-tradable cost		2,111,748	25,142	4,336,845	38,272,566	19,031,314	52,228,480
Total cost					126,083,163		52,313,362
Profit					153,663,861		439,166,360