

Assessment of Plantation Sector Contribution to the Economic Growth in North Sumatra, Indonesia: Social Accounting Matrix Multiplayer Analysis

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Abstract: *Plantation sector as the most important sector of the Indonesian economy which holds a lot of potentials for the future economic and income development of the nation. This research aimed at finding the contribution of plantation sector toward economic growth in North Sumatra using Social Accounting Matrix (SAM) analysis. A SAM can be used as a basis for an economy-wide model with several appealing features. It represents a very general accounting model, which subsumes all possible 'real-life' national accounting systems. Based on the SAM analysis it was found that plantation sector gives a significant influence on economic growth in North Sumatra, Indonesia. The biggest contribution comes from palm oil and its manufacturing such as CPO, vegetable oil and other similar product. Moreover, Plantation sector also give a significant influence to the household income. This can be showed from HIM of palm oil which reached IDR 1,4348 billion, followed by CPO, vegetable oil and similar product that reached IDR 1,3668 billion. In addition, Rubber oil reached IDR 1, 3628 billion that also categorized high.*

Key words: *plantation sector, economic growth, Social Accounting Matrix (SAM) analysis*

I. INTRODUCTION

North Sumatra is one of the provinces in Indonesia. In 2014 regional domestic income of North Sumatra contributes around 5.4% to the National income in which it was placed as the fifth top ten national income contributors. The economic growth of North Sumatra from 2010 to 2014 was 6.61% a year. The rate was higher than the rate of National economic growth in which the number only reaches 5.84 % annually. This rate indicated that North Sumatra is one of the leading provinces in Indonesia

One of the economic sectors that contribute much on economic growth in North Sumatra is from plantation sector. As stated by Hartono (2015) plantation sector is still a major sector in North Sumatra, Indonesia. Basically it provides employment opportunities for eradicates poverty and contributes to the growth of the economy. The pervasive influence of plantation on economic growth, especially in rural area. Kilkeny (1993) has also been articulated that plantation sector has built the economic center in some rural areas in Indonesia. Obidzinski (2012) said that strong and efficient plantation sector would enable a country to feed its growing population, generate employment, earn foreign exchange and provide raw materials for industries. The plantation sector has a multiplier effect on any nation's socio-economic and industrial fabric because of the multifunctional nature of agriculture

Hill (1998) also stated that stagnation in agriculture is the principal explanation for poor economic performance, while rising plantation productivity has been the most important concomitant of successful industrialization. This research aimed at finding the contribution of plantation plantation sector toward economic growth in North Sumatra using Social Accounting Matrix (SAM) analysis.

II. LITERATUR REVIEW

Sadono (2013) described plantation sector as the most important sector of the Indonesian economy which holds a lot of potentials for the future economic and income development of the nation as it had done in the past. Generally, the plantation sector contributes to the development of an economy in four major ways-product contribution, factor contribution, market contribution and income contribution (World Bank, 2007).

Noorsalim (2009) defines plantation as the science of making use of the land to raise plants. It is the simplification of natures food webs and the rechanneling of energy for human planting.

Bautista (2000) has descibe that agriculture is the profession of majority of humans. The United Nations Organization (2008) estimated that the world as a whole, over 50% of the world population is engaged in agriculture or dependent of it for a living, this is a general description of the sector. On the other hand, it includes farming, fishing, animal husbandry and forestry.

III. RESEARCH METHODS

The number of studies that analyze the linkages between agriculture and the rest of the economy using a SAM framework has noticeably increased over the recent years. A SAM can be used as a basis for an economy-wide model with several appealing features. It represents a very general accounting model, which subsumes all possible ‘real-life’ national accounting systems (Rocchi et al, 2005). However the application of SAM in North Sumatra hasn’t been done yet to measure plantation sector contribution to the economic growth in north sumatra, indonesia.

The main data of SAM analysis was taken from of Statistical Bureau of North Sumatra in 2013. And the additional data including the national economic and social survey, plantation census in 2013, the north government financial statistic, the census of small, medium and large industry was used to complete the data.

The multiplier matrix was developed using the following equation:

$$Y = M_a X \dots\dots\dots (1)$$

where M_a is multiplier matrix. The equation describes than in every change of endogenous output balance eksogen j as one unit will influence to the endogen balance i as amount as $M_a X$, where M_a is double matrix. Total diferential of Y is:

$$dY = M_a dX \dots\dots\dots (2)$$

so the transformation equation will be $dY/dX_j = M_{ij}$, in this case dY_i showed the cange of endogen balance $-i$ (for example household change), dX_j is the change of excogen j (for example is the output of investation that is allocated to one sector like plantation), and M_{ij} is addition of balance i to j .

The equation model described that in every output of endogen j as 1 unit will give influence to endogen balance i as 1 unit and balance i will also change as M_{ij} unit.

Some impact analysis of exogen balance that is used in the data analysis were : *Value Added Multiplier (VAM)*, *Household induced income multiplier (HIM)*, *Firm Income Multiplier (FIM)*, *Other Sector Income Multiplier (OTSM)*, *Owner income multiplier (OWM)*, *Production Multiplier (PM)*, *Gross Output Multiplier (GM)* dan *Government Income Multiplier (GIM)*.

IV. RESULT AND DISCUSSION

The result of North Sumatra Multipliers analysis in 2013 can be seen in the following table:

Tabel 1. North Sumatra Multipliers analysis of Plantation in 2013

SEKTOR	VAM	HIM	FIM	GIM	OTSM	OWM	PM	GM
A. Plantation sector								
1. Rubber	1.5646	1.3628	0.3742	0.1101	2.0461	1.1009	3.1470	6.5587
2. Chocolate	1.2232	1.0780	0.2790	0.0836	1.5287	1.0745	2.6032	5.2670
3. Coconut	1.4575	1.2448	0.3744	0.1072	1.9547	1.1398	3.0944	6.2784
4. Palm Oil	1.6230	1.4348	0.3670	0.1103	2.0403	1.0534	3.0937	6.6288
5. Coffe	1.4898	1.3231	0.3288	0.0999	1.8926	1.1266	3.0192	6.2608
6. Other plantation	1.3277	1.1536	0.3206	0.0940	1.6742	1.1327	2.8068	5.7027
7. CPO, vegetable oil and similar product	1.6015	1.3668	0.4148	0.1184	2.4360	1.1144	3.5504	7.0518
8. Tobacco industry	0.4478	0.3379	0.1628	0.0416	0.7307	1.1409	1.8717	2.8618
9. Rubber industry	1.1128	0.8866	0.3546	0.0943	1.7274	1.0915	2.8189	5.2672
B. Others sector								
10. Rice	1.3596	1.2115	0.2956	0.0903	1.5378	1.1925	2.7303	5.6873
11. Poultry	1.3596	1.1229	0.3911	0.1076	2.0964	1.0641	3.1605	6.1417
12. Forestry	0.9585	0.8167	0.2491	0.0710	1.1868	1.0297	2.2165	4.3118
13. Fishing	1.3121	1.0047	0.4620	0.1191	1.5119	1.0703	2.5822	5.4802
14. Mining	1.0980	0.7509	0.4811	0.1168	1.1764	1.0258	2.2022	4.6491
15. Food and beverage industry	1.1701	0.9561	0.3474	0.0946	1.8027	1.3844	3.1871	5.7552
16. textile industry	0.0626	0.0469	0.0232	0.0059	0.0760	1.0748	1.1508	1.2894
17. carpentry	0.3417	0.2607	0.1213	0.0312	0.5101	1.0482	1.5583	2.3132
18. Paper industry	0.5173	0.3639	0.2164	0.0532	0.5985	1.1599	1.7584	2.9092

19. Chemical Industry	0.2416	0.1818	0.0885	0.0226	0.3034	1.0461	1.3495	1.8840
20. Metal Industry	0.7759	0.6125	0.2539	0.0669	1.1376	1.2614	2.3990	4.1083
21. Other Industry	0.2058	0.1367	0.0945	0.0227	0.2155	1.0319	1.2474	1.7071
22. Electric and water	1.2520	0.8979	0.5056	0.1254	1.5636	1.0777	2.6413	5.4222
23. Building	1.2930	1.0342	0.4082	0.1088	2.1153	1.1225	3.2378	6.0820
24. Trading	1.6498	1.4054	0.4293	0.1224	1.9251	1.1833	3.1084	6.7153
25. Restaurant	1.3786	1.1220	0.4143	0.1123	2.5619	1.0398	3.6016	6.6288
26. Hotel	1.3856	1.0563	0.4925	0.1267	2.2600	1.0092	3.2692	6.3304
27. Transportation	1.3304	1.0546	0.4302	0.1138	1.7654	1.2698	3.0352	5.9643
28. Financial services	1.5499	1.2530	0.4766	0.1282	1.7671	1.4563	3.2233	6.6309
29. Individual and public services	1.4816	1.2711	0.3778	0.1084	2.1059	1.0488	3.1547	6.3936

Keterangan :

VAM =value added multiplier

HIM =household induced income multiplier

FIM =firm income multiplie

OTSM = other Sector Income Multiplier

OWM= owner income multiplier

PM =production income multiplie

GIM =government income multiplier

GM=Gross Output Multiplier

Table 1 above showed that trade sector has the highest VAM Sektor, in which it reached 1,6498, it is then followed by oil palm tree with the amount 1,6230. The VAM value of oil palm industry showed us that in every IDR 1 billion endogen injection will give the income capital as IDR 1,6230 billion. Capital and labor impact is one of the significant element of regional income rate, it means that oil palm industry can give a significant impact of North Sumatra regional income as IDR 1,6230 billion.

The highest amount of palm oil industry also give significant impact of its manufacturing such as is crude palm oil (CPO) industry, vegetable oil and others production, in which it is placed at the third highest VAM value as 1.6015. This calculation indicated that palm oil industry and its manufacture give a significant impact to the North Sumatra economic growth.

VAM calculation of rubber reached 1.5646 and it is placed at the fourth rank. However, this value were not followed by its manufacturing, in which it was placed in rank 20 with the amount of VAM 1,1128. This condition are influenced by the supporting industry of rubber manufacturing such as transportation and trading. Another highest VAM was the coffee and coconut.

In addition, the calculation in table 1 was supported by the impact of plantation sector to the economic growth in North Sumatra as can be seen in figure 1. Figure 1 showed that trading on the plantation product give the highest contribution on North Sumatra economic growth with 14.79%. while the plantation sector that give a biggest contribution on North Sumatra economic growth is CPO, vegetable oil and other similar product.

The rubber farming in which it has the high VAM only give 2,08% contribution to the economic growth. Meanwhile the rubber industry in which it was placed at rank 20 of VAM give a significant contribution to the North Sumatra economic growth with 2.58%

Plantation sector also give a significant influence to the household income. This can be showed from HIM of palm oil which reached 1,4348, followed by CPO industry, vegetable oil and similar product that reached IDR 1,3668 billion. Rubber oil reached IDR 1, 3628 billion that also categorized high. This HIM calculation indicated that palm oil give injection to IDR 1 billion for IDR 1,4348 for household income.

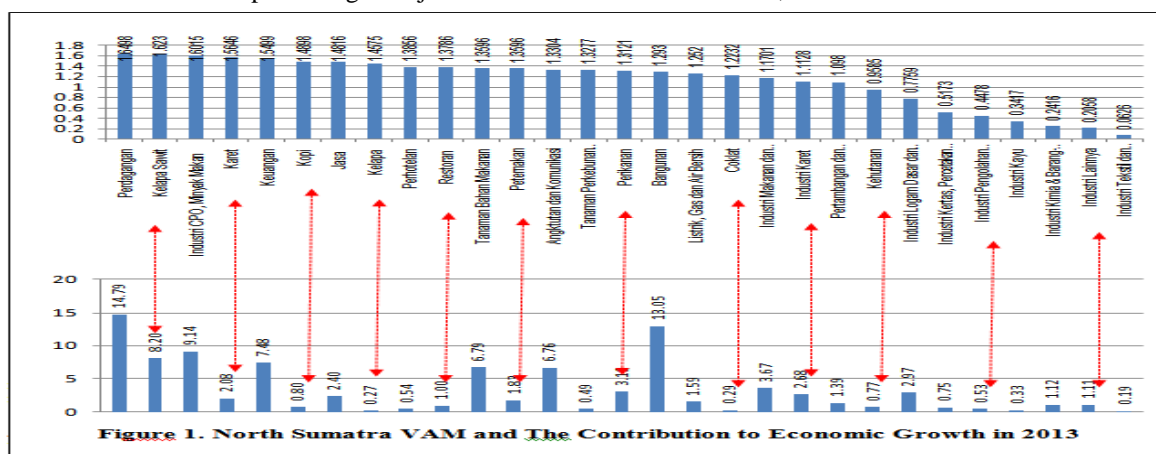


Figure 1. North Sumatra VAM and The Contribution to Economic Growth in 2013

Based on the result of Plantation census in 2013, the rate of household income from plantation sector reached IDR 7.90 billion rupiah. As a comparison, the rate of household income from rice farming is IDR 2.47 million, horticulture is IDR 1.47 million and fishing is IDR 1.54 million

In addition to this, others sector that has the highest HIM is trading sector, in which the amount reach 1,4556, social and individual service sector with 1,3960. Other sectors that give a high economic growth in North Sumatra is financial sector, renting and company services, poultry and food sector.

The highest gross output multiplier (GM) was in CPO, vegetable oil and similar product which reached

7.0518. This GM spread to regional income incensement with amount of IDR 1,6015 billion, household income (IDR 1,3668 billion), institution income(IDR 0.4148 billion) and government income (IDR 0.1184 billion), with total regional product of IDR 3,5504 billion. Thus the CPO, vegetable oil and similar industry give a significant contribution to the domestic economic growth in North Sumatra.

V. CONCLUSION

Based on the calculation of VA, VAM dan HI it was found that plantation sector gives a significant influence on economic growth in North Sumatra, Indonesia. The biggest contribution comes from pallm oil and its manufacturing such as CPO, vegetable oil and other similar product.

Plantation sector also give a significant influence to the household income. This can be showed from HIM of palm oil which reached IDR 1,4348 billion, followed by CPO, vegetable oil and similar product that reached IDR 1,3668 billion. In addition, Rubber oil reached IDR 1, 3628 billion that also categorized high.

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