

The Effect Of Oil Palm Farming On Income Distribution And Poverty Alleviation in Swampland Area

Tuti Heiriyani dan Luthfi Fatah
Dosen Fakultas Pertanian Unlam

ABSTRACT

In Indonesia, almost a quarter of its area is swampland therefore swampland development is important. This research is purposed to understand whether or not the cultivation of oil palm in swampland area contribute to the improvement of farmer welfare, and to understand the effect of oil palm cultivation in swampland area on income distribution and poverty alleviation in the area. This research will combine two approaches: macro and micro levels. At macro level a Social Accounting Matrix (SAM) will be utilized to investigate the impacts of oil palm cultivation on income distribution. At micro level, analyses will focus on farmers, firm owners, and traders (brokers) of oil palm plantation. The research results reveal that the cultivation of oil palm in swampland area will benefit more the agriculture entrepreneur households and high level households both urban and rural. Oil palm commodity is important for labor income improvement and will benefit poor farmer households compared to other sectors or commodities in the economy. Policy implications are that support should be given to production side. The provision of input at reasonable and affordable price, extension, guidance, and research to support oil palm cultivation are some example of appropriate policy for development of oil palm. The government needs to support farmer to be an entrepreneur. This can be triggered through training and farmer capacity building, following by adequate support of rural micro finance that suitable and has strong commitment to support farmer initiating and running their business in oil palm industry.

KEY WORDS: Oil-palm, income distribution, poverty alleviation, SAM, swamp-land

Background

Oil palm has an increasing contribution for Indonesia. Global market demand to CPO is increasing while supply of the

commodity is still limited. Development of oil palm plantation is one of government policy in order to enhance the base of Indonesian economy through managing resource endowment efficiently. Oil palm becoming more important as it serves as the

new source of energy in the middle increasing scarcity of fossil fuel.

The change in global climate and the increase in temperature force people to move to alternative source of energy that is pro environment and one of the energy source is the oil produced from oil palm. Oil palm has become a strategic agricultural commodity. Besides bio-fuel, oil palm has thousands of use. Its utilization ranges from food, cosmetics, and up to be used as medicine as well.

Considering the fact that tropical forest in Indonesia is wide, and that the value of oil produced from oil palm is high, oil palm plantation seems to be a profitable choice economically. However, it has to be noticed as well that in oil palm development there will be many other aspects or parties will be lost.

The expanding potentials of oil palm plantation and the fact that many farmers involved in the plantation, either as laborers or as owners, raise concerns about its impacts on income distribution and on improving farmers' welfare. As mostly oil palm farmers are poor, the development of oil palm plantations will help to reduce poverty if oil palm farmers are benefited largely from the cultivation. The policy relevance of this study lies in its objectives to investigate the influence of oil palm plantation on income distribution and its effects on farmer welfare. This knowledge will help decision makers in anticipating the growing tendency of oil palm expansion and deciding whether or not to develop

oil palm plantation in order to alleviate poverty.

Research Questions and Objectives

This research is purposed to clarify those concerns by addressing these research questions:

1. What are the effects of oil palm plantation in swampland area on income distribution?
2. Among farmers, firms (industries) or traders (brokers), who do receive the highest additional income from oil palm development in swampland area?
3. How does oil palm farming in swampland area contribute to improving farmer income and by how much?

Significance of the Research

In Indonesia swampland consists of 33 million hectares or about 18% of total area. This land is distributed in rural areas of Sumatera, Kalimantan, Irian and Sulawesi islands. Only about 4.5 million hectares of swamp land that has been utilized for various agricultural activities and many of these activities are subsistence, small-scale or inefficient. As the result, majority farmers of swamp area are still in poverty.

Meanwhile, farming is the main source of income for most of the

people living nearby the swamp area. Therefore, to reduce poverty for these people, agriculture needs to be improved. However, it is not easy to find agricultural commodity or agribusiness type to be developed, since swamp area is one of marginal lands, which needs special treatment in order to grow plant profitably.

One commodity that financially profitable to grow in swamp area is oil palm (*Elaeis guineensis* Jacq). This commodity has been cultivated quite largely in some parts of Sumatera and Sulawesi, and it has a clear tendency to expand in the near future. Although financial analysis shows that this commodity is profitable, the contribution of cultivating this commodity toward improving farmer welfare is unclear. Who gets benefit the most is still need to be investigated. The other concern is to understand which party among farmers, firms (industries) or traders (brokers) receiving the highest benefit.

Literature Review

Swampland ecosystems are important and have dominant roles on earth. Besides their functions as to provide numerous products for human use and consumption, including fossil fuels and food, they also function invaluablely as the "kidneys of the landscape" for their ability to purify polluted rivers, prevent and minimize flooding, protect shorelines, and replenish groundwater sources. Furthermore, swamplands also provide valuable

habitat to numerous species of waterfowl and wildlife (McCreedy and Miller 1997)

Swamplands are some areas "including swamp, marsh, bog, prairie pothole, or similar area, having a predominance of hydric soils that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, the growth and regeneration of hydrophytic vegetation." Simply stated, Swamplands contain (1) water or saturated soils for at least part of the year, (2) plants that have adapted to life in wet environments (hydrophytic vegetation), and (3) special soils that develop under depleted oxygen conditions (hydric soils) (Anderson, 1995).

In Indonesia, almost a quarter of its area is swampland. The swampland is found in rural areas of all major islands of Indonesia, including Sumatera, Kalimantan, Sulawesi and Irian. The size of swampland area in Indonesia reaches 33.4 millions hectares, including 20.11 million hectares of swamp-tidal and 13,280 million hectares of swamp (Balittra, 2004). The swampland in Indonesia has the potentials to substitute the farmlands that have been converted into housings and industries. The development of swampland is important for Indonesia and could significantly contribute to the provision of food for its growing population, with the growth rate stands at three millions people a year. The failure in

handling and utilizing swampland could result in a serious food security problem for Indonesia in the near future (Saragih, 2003). Swampland cultivation with appropriate commodities can accelerate economic growth in the region through its backward and forward linkages. It also contributes to agribusiness development and in turn employment (Luthfi et al., 2003).

The government of Indonesia has been utilizing swampland as one of the national food sources since PELITA I through the project of "Farming Development in Swamp-tidal Area", which was carried out in Sumatera and Kalimantan. In these two islands about 3.6 million hectares of swamplands have been cultivated by rural community with the help of Department of Public Facility in the land preparation process.

Besides that, the government has also facilitated the generation and distribution of swampland management technology, including water management and land management. For water management, utilization of swampland needs to manage water systems both macro and micro. For land management, the type, mineral and structure of swampland has to be given adequate attention and appropriate handling. Swampland management needs to carefully consider characteristic of the area (AARD, 2001).

Various agricultural crops can be cultivated in swampland areas. In

Indonesia mostly food crops are cultivated. Generally, food crop's productivity and crop intensity are still very low, and land utilization intensity is also very limited. For instance, from 9.53 million hectares swamplands that are potentials for agriculture, 4.19 has been reclaimed and prepared by the government. However, only about 1.5 million hectares have been planted with food crops (Balittra, 2004).

In some parts of Indonesia, swamplands have also been utilized for the cultivation of perennial commodities. Oil palm is one of the perennial crops that has been cultivating largely, mainly in swampland areas of Sumatera and some parts of Kalimantan. Financial analyses suggest that oil palm cultivation is feasible (Luthfi et al. 2003, Syukur 2003, Prasetyo 2002).

However, mainly the oil palm farming in swampland area is operated by large firms, and farmers are only workers for the firms. Although the oil palm cultivation financial analyses suggest that the farming is profitable, it is still unclear what the effect of the farming on income distribution in the area is. It is also lack of knowledge whether or not farmer welfare is improving through the promotion of oil palm cultivation in swampland area.

The main contribution of this research is to provide good knowledge about the potentials of developing oil palm farming in swampland area for reducing

poverty and improving income distribution in the area, and also to provide some empirical data about income generation and income distribution of cultivating oil palm in swampland areas among farmers, plantation owners and traders (brokers).

Two provinces are chosen to be investigated more in details in this project. One province is South Sumatera as to represent the well establish oil palm plantation. The

other province is South Kalimantan where the utilization of swampland, has just been started. By using these two different characteristics of oil palm plantation areas, the information that will be investigated will be more representative for the activity of Indonesian oil palm plantation in general.

Below is presented some descriptive data of these two areas where the research project will take place.

Table 1. Characteristics of Research Areas

Characteristics	South Sumatera	South Kalimantan
Provincial Capital	Palembang	Banjarmasin
Provincial Area (sqkm)	103,688	37,66
Percentage to total area of Indonesia	5.40	1.96
Male (in thousands)	3,444.12	1,491.9
Female (in thousands)	3,413.26	1,483.8
Total Male+Female (in thousands)	6,857.38	2,975.7
Population Density per sqkm	78	70
Sex Ratio	101.0	100.5
Growth Rate of Population (1990-2000)	2.39	1.45
Labor Force Participation Rate	57.46	65.46
Open Unemployment Rate	4.11	2.89
Gross Regional Domestic Product at current market prices (million rupiahs)	19,944,999	8,040,646
GRDP at constant 1993 market prices (million rupiahs)	14,072,706	6,293,905

Source : Statistic of Indonesia 2004.

The variables that will be investigated from the areas through this research are variables for micro data, including oil palm income of farmers, firms (industries) and traders (brokers).

This data will be combined with macro data at national level which will be organized in a Social Accounting Matrix (SAM) framework.

Methodology

This research combines two approaches: macro and micro levels. At macro level a Social Accounting Matrix (SAM) is utilized. The SAM is used mainly to analyze the distributive effects of oil palm development in swampland area on income using SAM based analyses.

To complement the macro analyses (SAM based analyses), the research will apply micro analysis as well. This will focus on farmers, firm owners, and traders (brokers) of oil palm plantation. This approach is used to gather information on how income generated from oil palm plantation is distributed among household types.

This also investigates how oil palm cultivation in swampland area contribute to improving farmer income, including the process of product transactions, price determination, farmer bargaining position and transaction cost, which all influence the proportion of the income generated from oil palm plantation received by farmers.

For the macro approach, data requirement includes the most recent SAM Indonesia, Indonesian Economic Indicators 2008 as the current data on Indonesian

economy and recent data about oil palm production including its input and output structures. The recent SAM of Indonesia is the 2005 Indonesia's SAM. This is used as the base matrix of SAM, which is then modified and combined with the Indonesian Economic Indicators April 2009 to develop an up to date SAM for the economy of Indonesia. The best up to date SAM that can be developed given the most recent data available is the SAM Indonesia 2008. To utilize the SAM Indonesia 2008 for analyses in this study, its' agricultural sector were disaggregated to represent the oil palm activities in the model.

Results and Discussions

The Indonesian SAM 2008 is developed based on Indonesian SAM 2005 released by Bureau of Statistical Centre. This base year of 2005 is then upgraded to 2008 using 2009 Indonesian Economic Indicators. Based on the 2005 SAM, GDP of Indonesia is IDR 2,896,945.16 million. In 2008, the recent data shows that GDP increase to IDR 4,954,028.90 million. The 2008 Indonesian SAM has been consistent with this figure. Based on the 2008 SAM, general description of Indonesian economy is as the following Table 2.

Table 2. General Description of Indonesian Economy

Account	Value (IDR millions)	Percentage
Labor	2,575,262.39	6.78
Capital	2,273,921.84	5.99
Household	3,751,725.54	9.88
Company	1,722,508.64	4.54
Government	1,117,304.73	2.94
Production Sectors	9,624,191.27	25.34
Trade and Transportation	1,061,663.76	2.80
Domestic Commodity	10,603,939.14	27.92
Imported Commodity	1,665,485.78	4.39
Capital Account	1,329,618.70	3.50
Indirect Tax	295,151.34	0.78
Subsidy	184,872.82	0.49
Overseas	1,768,498.92	4.66
TOTAL	37,974,144.87	100.00

Table 2 shows revenue value (in IDR million) of all accounts in the 2008 SAM. If outputs or inputs of all account in Indonesian economy are added together, their total value is almost IDR 38 trillion. Return to factors (labor and capital) produce income about 12% of the total output of the economy. Labor contribution is a little bit higher than the contribution of capital. Total income value produced by factors is IDR 4,849,184.23 million.

Different categories of households receive some of the income produced by factors. The households also receive transfers from various sources including other household categories and transfer from overseas. If these amounts are summed, the value stands at IDR 3,751,725.54 million. This comprises about 10% of total output of Indonesian economy. If we look at the total output value of commodity, the number stands at IDR12,269,424.92 million or

about 32% of Indonesian Output in total. From this amount IDR 10,603,939.14 million is output of domestic commodities, and IDR 1,665,485.78 million. This structure indicates that domestic commodity is more strategic for Indonesia compared to imported commodity. If we use total Indonesian output as denominator, we can see that domestic commodity contribute about 28% while the imported commodity only shares about 4%.

If we look at the importance of overseas account in Indonesian economy based on the 2008 SAM, we can see from the Table 2 above that contribution of overseas account in Indonesia's total output is less than 5% or IDR 1,768,498.92 million. This account structure implies that Indonesian economy has only little dependency on overseas. From IDR 37,974,144.87 million output of all accounts in Indonesian

economy, overseas account only share less than 5%. If the management of production and other economic transactions is appropriate, Indonesia can promote the improvement of its economy without strong needs to overseas intervention.

Income Effects of Oil Palm Plantation in Swamp Land Area

In the constructed 2008 SAM, production sectors and their commodities are grouped into six big categories as follows:

1. Food Crop, Livestock, Fishery, and Food Processor
4. Other Agriculture, Forestry, and Hunting
5. Oil Palm
6. Mining, Processor non food, Electricity, Gas, and Drinking Water
7. Trade, Restaurant and Hotel, Transportation and Communication, Individual Service
8. Finance, Real Estate, Government, Social and Cultural Service, and Entertainment

In the SAM income is generated by factors of production which are labor and capital. These labor and capital income will then flow to households of different categories. The source of income is the value of commodity produced production sectors.

To analyze the effects of oil palm plantation in swamp land area a mixed multiplier matrix calculated and constructed based on the 2008

SAM. The complete mixed multiplier is provided in Appendix 2.

Based on the mixed multiplier income effects of production sectors are as in Table 3 below. The Table captures the effects of shocks given to particular account in production sectors categories. Shock to production sectors means that intervention to the category is given in its production process.

As can be seen from Table 3 shock to production sectors has different effects, depend on which category the shock is given. If we observe the effect on labor income, among the categories 'oil palm' and 'other agriculture, forestry, and hunting' have the highest multiplier effects on labor. These two categories have the multiplier 0.7529. This means that if these categories are given additional one unit of shock, they will produce additional 0.7529 unit of income for labor.

Based on this fact we can understand that if government focus on increasing labor income, then the government could direct the shock to 'oil palm' or to 'other agriculture, forestry, and hunting'. The description above infers that oil palm commodity is important for labor income improvement.

The effects of production shock on capital is dominated by 'Mining, Processor non food, Electricity, Gas, and Drinking Water' category. Based on mixed multiplier analysis this category has the highest capital multiplier. It stands at 0.5395. 'Finance, Real Estate, Government, Social and Cultural

Service, and Entertainment' category stands at the second place with multiplier of 0.5382. 'Oil palm', 'Other agriculture, forestry, and hunting', and 'Trade, Restaurant and Hotel, Transportation and Communication, Individual Service' follow. The first two have the same multiplier (0.4143), followed by the third one with 0.4142 of multiplier

value. Although oil palm only stands at the third place for capital income effect of the shock, considering the multiplier value, we can understand that its effect is quite significant. It is much higher if we compare it with 'Food Crop, Livestock, Fishery, and Food Processor' category.

Table 3. Income Effects of 'Shocks on Production Sectors' on Labor and Capital Income

Account	Labor	Capital
Production Sectors		
Food Crop, Livestock, Fishery, and Food Processor	0.4710	0.2810
Other Agriculture, Forestry, and Hunting	0.7529	0.4143
Oil Palm	0.7529	0.4143
Mining, Processor non food, Electricity, Gas, and Drinking Water	0.4003	0.5395
Trade, Restaurant and Hotel, Transportation and Communication, Individual Service	0.6592	0.4142
Finance, Real Estate, Government, Social and Cultural Service, and Entertainment	0.6222	0.5382

Multiplier analysis of shock on production sectors of the six categories reveals that oil palm is dominant for labor income generation, but less dominant for capital income generation. This may be related to the facts that in oil palm plantation, labor shares significant contribution to the farm daily operation compared to other resources, both in terms of cost required and also in terms of quantity of activities. Therefore if the production is supported through the shock, the labor will be benefited more compared to the capital.

Income effects will be slightly different if the shock is directed to

the commodity. The shock to commodity means that intervention to the category is given in order to add value to the commodity. Table 4 illustrates that if the shock is given to domestic commodities category that generates the highest labor income is 'Trade, Restaurant and Hotel, Transportation and Communication, Individual Service'. This is then followed by 'Finance, Real Estate, Government, Social and Cultural Service, and Entertainment'. At the third high multiplier 'Mining, Processor non food, Electricity, Gas, and Drinking Water' takes the place. Oil palm has the smallest labor income multiplier.

There is an interesting figure here. 'Food Crop, Livestock, Fishery, and Food Processor' situates at the fourth place better than oil palm and other agriculture. These figures could be caused by the facts that the category is labor intensive. Many of the activities in this category are small-scale but they are numerous, so that as a sum their number is quite significant.

Meanwhile, if we look at the effect of commodity shock on capital income generation, the best

multiplier effect is provided by 'Finance, Real Estate, Government, Social and Cultural Service, and Entertainment', followed respectively by 'Mining, Processor non food, Electricity, Gas, and Drinking Water' and 'Trade, Restaurant and Hotel, Transportation and Communication, Individual Service'. Oil palm has the smallest multiplier. It seems clear for this situation that the more capital investment the higher multiplier effect for capital income generation.

Table 4. Income Effects of 'Shocks on Domestic Commodities' on Labor and Capital Income

Account	Labor	Capital
Domestic Commodities		
Food Crop, Livestock, Fishery, and Food Processor	0.1211	0.0761
Other Agriculture, Forestry, and Hunting	0.0689	0.0433
Oil Palm	0.0619	0.0389
Mining, Processor non food, Electricity, Gas, and Drinking Water	0.4196	0.5181
Trade, Restaurant and Hotel, Transportation and Communication, Individual Service	0.6475	0.4068
Finance, Real Estate, Government, Social and Cultural Service, and Entertainment	0.6161	0.5329

Table 4 reveals that based on multiplier analyses of domestic commodity shocks, oil palm is less important both in labor and capital income generation. Multiplier effects of oil palm for commodity shocks are relatively smaller than other categories. Even more, if capital income generation becomes our concern, among other categories oil palm has the smallest capital income multiplier.

These facts indicate that shocks for oil palm are better when directed to production than directed to commodities.

Income in the concerned economy is produced by production factors which are labor and capital. Capital income will mostly flow to company while labor income will flow to different category of households depending on the category of labor. Table 5 above describes how labor income

generated from oil palm is being distributed to different type of labor. It will have different multiplier effects depending on where was the shock directed to, production sectors or domestic commodity.

It can be seen on Table 5 that if the shock was given to production sectors then the most of labor income generated by multiplier effect will be received by 'Unpaid Agricultural Labor'. On the other hand, if the shock was directed to

domestic commodity, then the 'Paid Administration, Selling, and Service' will benefit most from the labor income flow. This will receive the highest income. Agricultural labor both paid and unpaid will receive no income. It is apparent from Table 5 that if the shock is on production the agricultural labor will benefit, while if the shock is on commodity seller and service will benefit more. Inclusive in this category is trader, agent, broker and dealer of various levels.

Table 5. The Distribution of Labor Income

Labor		Production	Commodity
Agriculture	Paid	0.1830	0.0000
	Un paid	0.2942	0.0000
Production, Operator of transportation, and Low income labor	Paid	0.0648	0.0097
	Un paid	0.0261	0.0054
Administration, Selling, and Service	Paid	0.0829	0.0209
	Un paid	0.0497	0.0190
Leadership, Army, Professional, and Technician	Paid	0.0437	0.0058
	Un paid	0.0084	0.0010

Flow of Oil Palm Income to Households

To understand who does acquire the most benefit of oil palm cultivation in swamp land area this income flows to households as multiplier effects of shock on production or commodity can describe the situation. If in particular we want to investigate the highest recipient of additional income from oil palm development in swamp land area among farmers, firms (industries) or traders (brokers), we need first to understand in which category of

households these parties belong to.

Majorities of farmers are in low labor agriculture and some of them are in rural low level households. Traders and brokers are mainly in the category of agriculture entrepreneur and rural high level households. Capital owners investing in oil palm will fall in the category of high level households both in urban area and rural areas. Firms or industries in this model are included in the category of company. Income generated from oil palm will flow to different households. Multiplier analysis

produces results as presented in Table 6.

If the shock is directed to oil palm's production process, the most benefit household is 'Agriculture Entrepreneur'. It has 0.2878 of multiplier effect. At the second place is 'Rural Low Level' and then followed by 'Rural High Level'. 'Agriculture Low Labor' has the lowest multiplier effect. The multiplier in Table 6 implies that with production shock rural community will benefit more. In particular households of

agricultural entrepreneur will benefit the most. This household category includes traders, brokers, and households that managing the cultivation oil palm and other plantation although with the small-scale farming. Low labor is less benefited compared to the other. Although the shock is directed to production process, the low labor agriculture households are lacking of ability to capture the benefit. They only receive wage in doing agriculture activities of oil palm. The owner of oil palm will receive benefit from the shock.

Table 6. Income Flow of 'Shock on Production and Commodity' on Different Households

Households		Production	Commodity
Agriculture	Low labor	0.0928	0.0025
	Entrepreneur	0.2878	0.0096
Rural	Low level	0.1590	0.0081
	High level	0.1248	0.0132
Urban	Low level	0.1244	0.0005
	High level	0.1234	0.0228
Company		0.3001	0.0277

Meanwhile company's share of income multiplier produced by the shock on production process is in fact higher than agriculture entrepreneur. The multiplier effect stands at 0.3001. This is caused by the fact that shock on production will make productivity is better and in turn will generate more return to capitals. This return is then flow to company. This makes company multiplier effect is higher than agriculture entrepreneur multiplier effect.

On the other hand, if the shock is given to commodity, the most benefit household is in the category of 'Urban High Level'. This is followed by 'Urban Low Level' at the second place and 'Rural High Level' at the third place.

This indicates with commodity shock the urban community and high level household will benefit more. Agricultural labor has less benefit if the shock is on commodity. Income flow of multiplier effect is not captured by

low level household and agricultural labor.

If we take the figure for company, the multiplier effect is slightly lower than the urban high level household, but still exceeding the multiplier of other household category. This is caused by the fact that for commodity the roles of agricultural company are reduced. Traders and brokers, and other commodity transaction or processing will have higher multiplier effect values if the shock is given to commodity.

From the description above we can infer that the cultivation of oil palm in swampland area based on this multiplier analysis will benefit more the agriculture entrepreneur households and the firms or companies if the shock is given to

production process. On the other hand, if the shock is directed to commodity then the most benefit is high level households both urban and rural. The companies are also benefit with this shock.

Contribution of Oil Palm to Farmer Welfare

Multiplier analysis reveals that oil palm development is a suitable choice of policy for poverty alleviation. Compared to other category of economic activities as represented in the SAM accounts, shock to oil palm production will produce the highest multiplier effects. The details of multiplier effects of shock on production of various categories in the economy of Indonesia are presented on Table 7 below.

Table 7. Multiplier effects of Production of Various Categories on Households

Households		1	2	3	4	5	6
Agriculture	Low labor	0.0415	0.0928	0.0928	0.0200	0.0266	0.0278
	Entrepreneur	0.1747	0.2878	0.2878	0.0879	0.1026	0.1223
Rural	Low level	0.1019	0.1590	0.1590	0.1095	0.1402	0.1079
	High level	0.0807	0.1248	0.1248	0.0677	0.0863	0.1016
Urban	Low level	0.0978	0.1244	0.1244	0.1817	0.2185	0.1943
	High level	0.0821	0.1234	0.1234	0.1371	0.2428	0.2710
Note:							
1	Food Crop, Livestock, Fishery, and Food Processor						
2	Other Agriculture, Forestry, and Hunting						
3	Oil Palm						
4	Mining, Processor non food, Electricity, Gas, and Drinking Water						
5	Trade, Restaurant and Hotel, Transportation and Communication, Individual Service						
6	Finance, Real Estate, Government, Social and Cultural Service, and Entertainment						

From Table 7 we can see that multiplier effects of shock on production of oil palm will produce multiplier effect 0.0928 to 'Low Labor Agriculture' household and 0.1590 to 'Low Level Rural' household. These two values of multiplier effects are the highest if we compared with other categories for the same household levels in the economy. 'Other Agriculture, Forestry, and Hunting' has the same multiplier effect value with oil palm.

The cause of this is that in the production structure 'oil palm' and 'other agriculture, forestry, hunting' are the same. In the SAM account agriculture basically is divided only into two big categories: (1) Food Crop, Livestock, Fishery, and Food Processor and (2) Food Crop,

Livestock, Fishery, and Food Processor. Oil palm was excluded from 'Other Agriculture, Forestry, and Hunting' for the purposes of analyses, therefore their values in production structure has very little difference which are not reflected in the multiplier effect for shock on production aspect.

Poor farmer households mainly fall in the category of 'Low Labor Agriculture' and 'Low Level Rural' households. To help improving these poor farmers' welfare the target of income multiplier effects should be directed toward these two households. Table 7 shows that shock directed to oil palm production is suitable for the purpose. This shock will produce multiplier effects that will benefit these two categories of household,

and the multiplier of this shock produce higher values than the value produced by shocks on other categories.

Shock to food crop produces less multiplier effect for 'Low Labor Agriculture' household than shock on oil palm. Its multiplier only stands at 0.4105. Actually many poor farmer households grow food crop. This is basically based on the concern of food security for the family and also based on the facts that this food crop has been cultivated years since their parents and parents of parents. They get used to this crop cultivation, and movement to other crop will require significant efforts, not only internally by them-selves but also for some degree requires external help.

Although the analysis shows that oil palm is better in terms of multiplier effect produced, it is a challenge to introduce this crop replacing food crop. Food security and skill concern will be significant constraints for majority of farmers. Some possible easy to adopt option for farmer is if oil palm can be introduced in-line with the cultivation of food crop category which in this SAM model includes food crop, livestock, fishery, and food processor.

As previously explained, in the model shocks could be directed to production side or to commodity side, and based on the analysis these two directions will have quite significant differences. In shock policy it is very important to maintain that the shock on oil palm

is directed to production side, not to commodity side, because if the shock is directed to commodity side the shock on oil palm is no

longer pro poor farmer households. For detail please see Table 8 below.

Table 8. Multiplier effects of Commodity of Various Categories on Households

Households		1	2	3	4	5	6
Agriculture	Low labor	0.0049	0.0028	0.0025	0.0203	0.0261	0.0275
	Entrepreneur	0.0189	0.0107	0.0096	0.0880	0.1008	0.1211
Rural	Low level	0.0258	0.0147	0.0132	0.1108	0.1377	0.1069
	High level	0.0159	0.0090	0.0081	0.0684	0.0847	0.1006
Urban	Low level	0.0401	0.0229	0.0205	0.1824	0.2146	0.1924
	High level	0.0446	0.0254	0.0228	0.1454	0.2385	0.2684
Note:							
1	Food Crop, Livestock, Fishery, and Food Processor						
2	Other Agriculture, Forestry, and Hunting						
3	Oil Palm						
4	Mining, Processor non food, Electricity, Gas, and Drinking Water						
5	Trade, Restaurant and Hotel, Transportation and Communication, Individual Service						
6	Finance, Real Estate, Government, Social and Cultural Service, and Entertainment						

Table 8 shows that if the shock is given to oil palm on commodity side the multiplier effect for 'Low Labor Agriculture' household is only 0.0025. This is actually the smallest if compared to other categories' multiplier effects. The highest multiplier effect will be produced by 'Finance, Real Estate, Government, Social and Cultural Service, and Entertainment' category of commodity. Shock on oil palm on commodity side will mostly benefit 'High Level Urban' household. The multiplier effect for this category is the highest that is 0.0228 compared to the multiplier effects received by other household categories. In this shock

capital owners gain more. Urban high level household are mainly capital owner who invest their capital in oil palm.

If we observe 'Rural Low Level' households, multiplier effect of oil palm from the shock on commodity is also the smallest, it stands only at 0.0132. The highest multiplier for this household category is from 'Food Crop, Livestock, Fishery, and Food Processor'. Its multiplier effect received by 'Rural Low Level' household is 0.0258. Rural low level households consist of farmers who have small land and small farming. Small-scale oil palm farmers are also included in this

category although their numbers are very limited. Majority of these farmers are growing food crops, livestock and fishery. Therefore, shock on oil palm commodity does not benefit this category very much. The multiplier effect will be more benefited for them if the shock is directed to 'Food Crop, Livestock, Fishery, and Food Processor'.

It is apparent from the Table above that shock on commodity of oil palm does not benefit the poor farmers. Instead it will benefit the capital owners.

Policy Implication

Based on multiplier analyses it is obvious that oil palm development is more suitable to help improving poor farmer welfare compared to other production sectors and commodities, however it will bring more benefit for 'Agriculture Entrepreneur' and 'Rural Low Level' households. Therefore, a policy of oil palm development for poverty alleviation needs a careful attention.

Some policy implications based on the research results are that in promoting oil palm development, it is very important that support should be given to production side not to commodity side. Production side is part of the oil palm industry which operates in production process. This includes land preparation, seeds provision, activities of cultivation, and harvesting. Commodity side is all efforts to add value to oil palm

products. This includes post harvest handling, transporting, processing, and other downstream process to generate value added to the products. Support to production side will benefit labor and to commodity side will benefit capital owner more.

The provision of input at reasonable and affordable price, extension, guidance, and research to support oil palm cultivation are some example of appropriate policy for development of oil palm. Price supports, infrastructure for transportation, processing factories and the likes will be not appropriate. These activity will not benefit poor farmers, instead it will benefit capital owner from the households of high level urban and rural.

Another important policy implication is that the government needs to facilitate and to encourage farmer to be an entrepreneur, not labor. The multiplier effect of shock to oil palm on production aspect will mostly benefit agriculture entrepreneur. This can be triggered through training and farmer capacity building, following by adequate support of rural micro finance that suitable and has strong commitment to support farmer initiating and running their business in oil palm industry.

References

- AARD, 2001, "The potentials of swamplands for agriculture", *Bulletin of Agricultural Research and Development*, Vol. 23 No. 6, p 3-7.
- Anderson, Julie, 1995, *Wetland incentives programs for landowner*, Austin-Texas: Texas Parks and Wildlife Department.
- Balittra, 2004, *Characteristics and prospect of swampland development*, Banjarbaru: Swampland Research Centre.
- Luthfi et al., 2003, "Regional development through land utilization to improve welfare and the performance of regional economy", Research report, Banjarbaru: Collaboration between Faculty of Agriculture Lambung Mangkurat University and Regional Development Planning Agency of Hulu Sungai Selatan Distric.
- McCreedy, Clark D. and Brian K. Miller, 1997, "Farm income through conservation: the wetlands reserve program" *Hoosier Farmland Wildlife Notes Fostering Wildlife in Agriculture Vol. 3 No. 2 p.130*.
- Prasetyo, Sigit, 2002, "The evaluation of oil palm plantation with partnerships system in Kalumpang District of South Kalimantan Province", Thesis for Graduate Degree, Banjarbaru: Faculty of Agriculture Lambung Mangkurat University.
- Saragih, Bungaran, 2003, "Swampland (33 million hectares) replaces farming in Java". National expose of Swampland farming, Karang Buah South Kalimantan Wednesday, July 30th.
- Syukur, Suheimi, 2003, *Oil palm in brief*, Pematang Siantar: Marihat Research Centre