The Potentials of Agro-Industry for Growth Promotion and Equality Improvement in Indonesia

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ABSTRACT

Despite its significant roles in accumulating and sustaining growth, agriculture's contribution to GDP and employment inevitably decreases as the economy grows. One possible strategy to promote the welfare of the agricultural sectors as well attain overall economic growth is by the development of agro-industry. Earlier research findings have contended that agro-industry improves income equality while still maintaining economic growth. This article uses empirical data in a Social Accounting Matrix (SAM) framework to verify these findings. The results reveal that agro-industry is indeed an appropriate vehicle for pursuing the goals of growth promotion and income equality.

INTRODUCTION

Although the contribution of agriculture to GDP and employment inevitably decreases as the economy grows, the current beliefs seem to point towards the increasing importance of agriculture. The views toward agriculture have significantly changed. Agriculture is no longer considered as a passive sector, from which resources are squeezed and extracted to support other sectors, particularly industry. Instead, it is believed that agriculture has significant roles in economic development.

Agriculture's roles become more obvious if viewed in the context of the structural transformation process. Agriculture has critical effects on industrialization and economic growth (Lewis 2000; Ruttan and Hayami 1984). It is crucial for raising export earnings, generating employment, and attaining food security (Alexandratos 1995; Anwar 1991; Babu 2000; Bahri, Suryana, and Erwidodo 1998; Hayami and Kikuchi 1987; Paukert et al. 1981). It helps a country to raise the living standard of farmers, to create a domestic market for industrial products and to improve the terms of trade (Lewis 2000). Agriculture also has important roles in accumulating and self-sustaining growth (Johnston and Mellor 1995).

One possible strategy to improve the welfare of the agricultural sectors and attain overall economic growth is through the development of agro-industry—a rural-based industry with business characteristics, and is primarily engaged in the processing of agricultural products (Adjid 1995; Austin 1981; Hsu 1997; Manwan et al. 1998; Solahuddin 1999; Suryana et al. 1998).

This paper seeks to verify the findings of previous studies on the importance of agro-industries, by using empirical data organized in a Social Accounting Matrix (SAM) framework. Following this introduction, Section 2 presents some theoretical findings regarding the roles of agro-industry. Then, in Section 3, the data used and the methodology adopted by this paper are described briefly. Section 4 reports the results of the analysis and discusses the roles of agro-industry in economic development and growth promotion, while Section 5 focuses on its role in income equality improvement. Section 6 delves into the ways by which to develop the potentials of agro-industries. Finally, Section 6 presents the summary and conclusions of the paper.

RESEARCH FINDINGS
ON AGRO-INDUSTRIES

The decline of agriculture's share in a growing economy is inevitable, particularly its shares in the gross domestic product (GDP) and employment (Anderson 1987; Anderson and Pangestu 1995; Antle 1999; Holt and Pryor 1999; Johnson 1991; Mellor 1984). The logical consequence of this trend is that agriculture's importance in economic development will diminish. The absolute size of agriculture is nevertheless increasing. The view which sees agriculture as merely playing a supporting role to more dynamic sectors (Fei and Ranis 1961; Hirschman 1958; Johnston and Mellor 1995; Jorgenson 1961; Lewis 1954; Rosentein-Rodan 1943; Scitovsky 1954), has notably changed to the view that agriculture is important to foster industrialization. Many studies have concluded that agriculture increases export earnings, generates employment, and ensures food security (Alexandratos 1995; Anwar 1991; Babu 2000; Bahri, Suryana and Erwidodo 1998; Hayami and Kikuchi 1987; Paukert et al. 1981). Moreover, it raises the living standard of farmers, generates a domestic market for industrial products, and improves the terms of trade (Lewis 2000). Agriculture also has important roles in accumulating and self-sustaining growth (Johnston and Mellor 1995). Moreover, governments seem to focus more attention to agriculture as economic growth progresses. Anderson (1986) revealed that based on cross-sectional evidence, governments tended to shift from taxing agriculture, to supporting or protecting it as their economies grew.

Given these characteristics of agriculture, it is important to formulate the appropriate agricultural development policies. Otherwise, government would encounter obstacles in reaching the goals it has set. The Indonesian experience would prove instructive. Indonesia has been successfully shifting from the large-scale importation of rice to self-sufficiency in this crop. However, majority of farmers remain poor and rural areas are receiving less attention in development programs (Adjid 1995; Yanuar 2005).

Around the late 1980s, Indonesia started to modify its paradigm of agricultural development. While the previous thrust has been to increase productivity at a faster rate to ensure food availability and to support industrialization, the focus has turned toward increasing the income and welfare of farmers. The new paradigm harnesses the labor force available in rural areas (Suryana et al. 1998), and establishes production systems which optimally utilize the available resources in a particular region (Manwan et al. 1998). It builds agriculture's linkages with other related sub-systems including infrastructure, processing, marketing, and distribution (Solahuddin 1999). The development of efficient rural-based agribusinesses, with appropriate capital intensity and locally-specific technology is a strategy that conforms to this new paradigm (Solahuddin 1999; Suryana et al, 1998). Agribusiness, which integrates farming with business activities (Adjid 1995), consists of four main sub-systems, namely: (1) input delivery, (2) farming, (3) postharvest and processing (agro-industry), and (4) marketing and distribution (Suryana et al, 1998).

Agro-industry is one sub-system of agribusiness that has a strategic position in the new paradigm because it has several important roles that help to improve income distribution while also still maintaining growth. Agro-industry is an industry that uses or processes agricultural products as raw materials in its production process (Austin 1981; Hsu 1997). This will help to promote the growth of the agricultural sector through the increased demand for agricultural products.

Some previous studies have found that agro-industrial development is very important in order to accelerate economic development while improving income distribution as well. Holt and Pryor (1999) revealed that the mature agribusiness has positive correlation to economic growth. In relation to this, Nasution (1991) has argued that agro-industries can serve as intermediaries in the economic development process, by helping maintain a smooth flow of resources between the traditional sectors (primarily consisting of small-scale farms), and the secondary sectors (primarily composed of industries and manufactures).

In Indonesia, a large percentage of the labor force in the agricultural sector is characterized by low productivity and low income. Many are forced to stay in the agricultural sectors because they are disadvantaged economically and socially from improving their lot. They lack the capacity and the means to acquire better or more skills that

can help them earn higher incomes. Urban industry, on the other hand, could accommodate only a small proportion of the growing number of rural labor (Staatz and Eicher 1984). The poor farmer thus appears forever trapped in a vicious cycle of poverty.

Agro-industries can break this cycle by providing more productive employment for the rapidly growing rural labor force. The demand from small-scale but labor-intensive agro-industrial firms can help alleviate rural unemployment. Giovannucci (2001) suggests that given the inevitable contraction of agriculture during economic growth, agribusiness should be tapped to provide employment and contribute greater economic value. Agro-industries, particularly small-scale and medium-scale ones have effectively provided employment for unskilled labor (Hayami and Kikuchi 1987). Agro-industry serves as a catalytic factor which stimulates all levels of rural development (Giovannucci 2001; Kinsey 1987). This in turn will help to reduce the rural-urban disparity.

Agro-industry ensures food security. It has a vital role in improving the poor people's access to food or their purchasing ability, both in rural and urban areas. The ability of agro-industries to promote the low-cost preservation, processing, marketing and transportation of food will help provide the poor with cheaper food

It is an accepted fact that in order to increase the income of the rural poor, they need to be paid higher prices for the agricultural products they sell. Food prices are a major determinant of the real income of the rural poor (Staatz and Eicher 1984). However, it should be considered as well that the increase of food prices would have adverse effects. For the majority of Indonesians, the proportion of food expenditure is quite high. If food prices increase, their welfare will significantly decrease. Thus the long-term effect of the farmers' poverty would be an increased urbanization because farmers would be forced to leave their farms in rural areas to try to find jobs in the urban areas. As what has been introduced by Harris and Todaro (1970) in their "two-sector model of migration, unemployment, and development", the expected higher wage in urban areas would act like a magnet for the poor unemployed rural populace.

To deal with the situation, agro-industry offers a promising alternative. The growing production in agricultural sectors would keep the food prices low. The farmers would receive higher income through the value-added generated by agro-industry. This comes about because the prices of agricultural products, including food, are increased through processing or through improved marketing channels. To cite an example, a farmers' association in Pelaihari, South Kalimantan has pioneered a business venture that has improved the marketing of corn, thereby succeeding in raising the income of corn farmers and benefiting the association. Corn products from member-farmers are collected and priced variably based on quality. The association then processes the corn and then sells it directly to a poultry feed company. This case has shown the importance of an individual or institution to initiate the establishment of this type of business and supervise its operations. Ordinary farmers, on their own, will rarely have the means to start a business venture like this. On the other hand, it would be easier to motivate them to participate in a venture that has been established and shows signs of success.

Clearly, the development of rural agribusiness and agro-industry can help to stem the exodus of rural labor to urban areas where they could exacerbate the existing unemployment problems. Because of the abundant labor supply in rural areas, the marginal value productivity in the agricultural sectors has been very low. Agro-industry solves this problem by providing employment in rural area. This not only generates income, but also increases the wage rate and improves the marginal value productivity of rural labor (Solahuddin 1999).

Furthermore, since agro-industries also contribute to enhancing the viability of small-scale farms, poor farmers would not have to suffer the loss of their main income sources. Agro-industries can help small-scale farmers capture a segment of the market through the products they sell. More importantly, agro-industries provide the small farmers the opportunities to augment their incomes through the value added generated by processing their own agricultural products (Schejtman 1994).

Generally, agro-industries in developing countries are labor-intensive, small-scale and relatively efficient enterprise systems. Their expansion has favorable linkages to small-scale agricultural sectors, improving their incomes, and providing employment for the rural landless

and poor farmers (Kinsey 1987). Although they produce less return to capital owners, they do generate a reasonable additional income for the poor. Agro-industries can be started with only small amount of investment, and are therefore suitable for rural people with little capital. Agro-industries therefore have the potential to foster growth without sacrificing the goal of equity.

DATA AND METHODS

This paper seeks to verify through empirical data previous findings regarding the roles of agro-industry. For this purpose, we intend to draw up a social accounting matrix (SAM) using the South Kalimantan Province as a case study. In constructing a SAM for South Kalimantan Province, all economic activities have been grouped into 19 accounts. Each account represents a bunch of economic activities that belong to the same category. Factors are categorized into two accounts, which are labor and capital. Sectors are categorized into agriculture, agro-industry, industry, and service. Institutions in South Kalimantan Province are categorized into eight accounts representing various types of households and corporations. The rest of the categories represent exogenous accounts. These categories include government, indirect taxes, subsidy, capital balance, and outer regions. The category on "outer regions" covers all transactions entered into in South Kalimantan Province, whether with other provinces or other countries. Data for each account represent the cumulative data of each activity that belongs to the category. For example, the data on the agriculture account are the sum of all agricultural activities which cover food farming, fishery, forestry, and livestock, among others.

In South Kalimantan, agro-industries consist of small-scale and large-scale units. In terms of scale, most agro-industries are household businesses, although there are some companies running agro-industries as well. The complete list of agro-industries in South Kalimantan Province is provided in Table 1.

The dominant industry in South Kalimantan is coal mining. This industry contributes 31% of the total industrial output of the province. The next large industries are plywood and wood sawmill

Table 1. Type of Agro-industries in South Kalimantan Province

No	Types
1	Soy sauce industry
2	Fish paste industry
3	Soy bean industry
4	Herb medicine industry
5	Coffee powder industry
6	Acid industry
7	Tea industry
8	Nut industry
9	Fish chip industry
10	Grape and honey industry
11	Salted fish industry
12	Dry and wet cake industry
13	Banana industry
14	Fruit industry
15	Wheat and rice flour industry
16	Noodle industry
17	Brown sugar industry
18	Fish flour industry
19	Dried cassava industry
20	Shrimp paste industry
21	Coconut oil industry
22	Coconut cake industry
23	Cold powder industry
24	Bamboo industry
25	Purun industry
26	Coconut handcraft industry
27	Rice mill industry
28	Meat industry
29	Rubber industry

with 21% share, and construction with 18% share. The complete list of industries in South Kalimantan Province is shown in Table 2.

To help construct the SAM, three surveys have been carried out in the South Kalimantan Province, namely, the general, the agro-industrial, and the household surveys. The general survey was exploratory in nature. Its goal was to come up with an inventory of the agro-industrial activities in each district of South Kalimantan Province. The methods of data collection in this survey consisted of direct observations in the field, the interview of informants, and the literature search. This survey's output was the inventory of agro-industries in South Kalimantan Province Indonesia, listed according to number, type and scale. This was then used as the sampling frame for the next stage which was the agro-industrial survey.

Table 2. Industries in South Kalimantan Province

Sector of Industry	Output (Rp millions)	%
Coal mining	6808934	31
Industry of plywood and wood sawmill.	4505740	21
Construction	3843496	18
Furniture	2921193	13
Oil mining	928660	4
Rubber and plastic industry.	905910	4
Chemical industry	782468	4
Metal industry, machine and other processing industry	334431	2
Digging	292513	1
Textile industry, man-made clothes and husk.	200560	1
Other mining	160482	1
Paper industry, printing and publication.	106414	0
Digging industry of non-metal.	37243	0
TOTAL	**21828044**	**100**

In the agro-industrial survey, primary and secondary data were collected. Primary data were acquired through direct observations and by interviewing informants. Secondary data were gathered from relevant publications such as the reports from particular institutions involved in agro-industries.

The SAM survey also needed primary and secondary household data. As in the agro-industrial survey, secondary data were also collected from relevant institutions and publications. For primary data, respondents were chosen from all the districts of South Kalimantan Province. The respondents were chosen purposively so as to represent both poor and rich households.

In data analysis, mixed multipliers are mainly utilized following a formula adapted from Lewis (1992) and Rich (1997). The multiplier exhibits broad linkages, covering not only sectoral (output) forward and backward linkages, but also forward and backward linkages among and within factors (value added) and institutions (income).

The base year for the SAM is 2004, and the transaction unit is million rupiahs. The complete 2004 SAM of South Kalimantan Province is provided in Table 3.

THE ROLES OF AGRO-INDUSTRY
IN GROWTH PROMOTION

Among the economic sectors in the South Kalimantan Province, agro-industry seems to be the least important, as it has the smallest share (less than one percent) either in output or in value added. The highest shares belong to industry. More than half of the shares in output and value-added go to this sector. The output multiplier, which measures the change in output as the result of an injection on a particular account in the economy, also reveals a similar figure. Industry has the highest output multiplier.

Despite its small shares in those three measures above, agro-industry has some potential advantages. As seen in Table 4, agro-industry has the highest value-added share in output (79.11%), and the highest value-added multiplier (0.85). This reveals the potentials of agro-industry in generating factorial income for the economy. These figures confirm the previous findings that agro-industry is suitable for income generation (Anwar 1991; Solahuddin 1999).

In terms of productivity, agro-industry is in good shape. Although its capital productivity is the lowest (1.38), its labor productivity is the best among the four sectors at 15.59. In contrast, the labor productivity of industry which is the most dominant sector in the economy, is only 10.97. The high score of the former is due to the fact that most agro-industries in the region are informal sectors which are characterized by high labor intensity, high velocity of money and high value added. Being small-scale, they require only minimal investment and therefore produce relatively smaller output. Despite the low absolute value of output,

Table 3. SAM 2004 of South Kalimantan Province (million rupiahs)

Type	Accounts	Code	1	2	3	4	5	6	7	8	9
Factors	Labor	1	0	0	1990405	397520	10676	917969	0	0	0
	Capital	2	0	0	8132149	1263317	121026	4602529	0	0	0
Sectors	Industry	3	0	0	4610548	261023	15198	1201115	209737	297482	635730
	Service	4	0	0	403869	22865	2042	105209	23272	33254	71063
	Agro-industry	5	0	0	18988	1068	73	4942	1521	2185	4677
	Agriculture	6	0	0	1340290	75879	4382	349171	188153	262820	434203
Institutions	Landless farmer	7	187688	72485	0	0	0	0	1024	1468	3138
	Small land-owner farmer	8	268219	231084	0	0	0	0	1474	2098	4489
	Large land-owner farmer	9	573198	310163	0	0	0	0	3138	4483	9578
	Low-income non-farmer	10	950938	712234	0	0	0	0	4883	6977	14914
	Middle-income non-farmer	11	767806	505278	0	0	0	0	2809	4014	8575
	High-income non-farmer	12	660250	339635	0	0	0	0	3615	5166	11041
	Very high-income non-farmer	13	63086	1258518	0	0	0	0	2224	3177	6789
	Corporation	14	0	4678481	0	0	0	0	0	0	0
Exogenous	Government	15	0	4855623	0	0	0	0	10988	15699	33552
	Indirect taxes	16	0	0	365888	51020	7223	49384	0	0	0
	Subsidy	17	0	0	0	0	0	0	0	0	0
	Capital	18	0	0	0	0	0	0	0	61567	131505
	Outer regions	19	0	1331431	4965905	197303	5861	709548	74269	595723	966394
	TOTAL		3471185	14294932	21828044	2269996	166482	7939867	527106	1296114	2335648

1 US Dollar = 9,319.80 Indonesian Rupiah as per Friday, December 31, 2004

Table 3 (Continued)

Code	10	11	12	13	14	15	16	17	18	19	Total
1	0	0	0	0	0	0	0	0	0	154614	3471185
2	0	0	0	0	0	0	0	0	0	175911	14294933
3	989364	568846	732282	450368	0	355768	0	101105	3780329	7619151	21828045
4	110590	63584	81855	50341	0	249057	0	0	331141	721855	2269998
5	7272	4185	5382	3307	0	606	0	0	6719	105554	166480
6	968950	372068	477122	665026	0	4284	0	0	819916	1977603	7939868
7	4883	2809	3615	2224	16353	91081	0	0	0	140336	527105
8	6983	4018	5175	3177	23370	467366	0	0	0	278661	1296114
9	14914	8575	11041	6789	49942	998786	0	0	0	345041	2335648
10	23212	13345	17181	10568	77721	1164407	0	0	0	498388	3494767
11	13345	7675	9877	6074	44687	893699	0	0	0	565762	2829600
12	17181	9877	12715	7821	57528	1150470	0	0	0	792576	3067875
13	10568	6074	7821	4809	35380	707563	0	0	0	144592	2250601
14	0	0	0	0	18455	0	0	0	0	1011415	5708351
15	52214	30022	38649	23769	1164669	221183	473516	580349	0	187186	7687417
16	0	0	0	0	0	0	0	0	0	0	473515
17	0	0	0	0	0	101105	0	0	0	580349	681454
18	204652	707576	505423	329132	3078577	288548	0	0	0	0	5306980
19	1070640	1030947	1159740	687198	1141667	993496	0	0	368873	0	15298996
Total	**3494768**	**2829601**	**3067876**	**2250602**	**5708350**	**7687418**	**473516**	**681454**	**5306979**	**15298993**	**100928932**

Table 4. Output, Value Added, Labor, and Capital (in Absolute Values, Shares and Ratios) of Four Main Sectors in South Kalimantan Province Economy

Description	Industry	Service	Agroindustry	Agriculture
Absolute Values (million rupiahs)				
Output	21828045	2269998	166480	7939868
Value Added	10122555	1660838	131702	5520498
Labor	1990405	397520	10676	917969
Capital	8132149	1263317	121026	4602529
Share and Ratios				
Share in Output (%)	67.78	7.05	0.52	24.65
Share in Value Added (%)	58.06	9.53	0.76	31.66
Value Added share in Output (%)	46.37	73.16	79.11	69.53
Labor Productivity	10.97	5.71	15.59	8.65
Capital Productivity	2.68	1.80	1.38	1.73
Capital/ Labor Ratio	4.09	3.18	11.34	5.01
Capital share in Output	0.37	0.56	0.73	0.58
Total Factor Productivity	9.44	3.94	7.35	5.74
Multiplier				
Output	1.22	1.13	1.10	1.16
Value Added	0.61	0.81	0.85	0.80

however, agro-industries generate very high returns to labor.

Following Sargent and Rodriguez (2001), one can use total factor productivity (TFP) as a more reliable measure for labor productivity. They argue that TFP is more effective and reliable over the long-run growth process, whereas labor productivity is more reliable in the short run, when the underlying growth process is uncertain, or when capital stock data are unreliable. Agro-industry has a TFP of 7.35, which is the second highest after industry (9.44). This implies that agro-industry is an important sector in the economy, particularly when production activities and value-added generation process rely more on labor. It has the capability to create more value-added in terms of its scale and output. It has also the capacity to boost growth both in the short run and in the long run. If its share can increase, agro-industry can function as an alternative engine of growth (Adjid et al. 1998; Suryana et al. 1998), and play important roles in the economic transformation process (Nasution 1991).

In addition, the high labor requirements in agro-industries allow them greater opportunities to absorb the redundant labor that used to work in the agricultural sector with very low productivity, and are unable to find employment in urban industries (Staatz and Eicher 1984). Agro-industries solve this problem by providing productive employment for the rapidly growing rural labor (Anwar 1991; Giovannucci 2001).

In terms of total backward linkages, agro-industry and service are the highest achievers at 2.50 (Table 5). Of this total, agro-industry gives its best performance in forming value-added backward linkages at 0.85. When it comes to forming sectoral backward linkages, agro-industry turns in the poorest performance at only 1.10. In terms of income linkage, agro-industry stands at 0.54, coming in second after industry (0.56). These findings emphasize the strength of agro-industry's roles in the economy. Its high value-added linkage will make agro-industry generate more factorial income. This income is distributed to households together with some leakage flows to the other regions. The income linkage of agro-industry, as shown in this table, is high, and thus benefits the economy substantially. If income growth among households is broadly based, it

Table 5. Backward Linkages in South Kalimantan Province

Description	Industry	Service	Agro-industry	Agriculture
Labor	0.12	0.19	0.08	0.14
Non-labor	0.49	0.62	0.78	0.66
Factorial/value added/GDP	0.61	0.81	0.85	0.80
Industry	1.27	0.14	0.11	0.19
Service	0.02	1.01	0.02	0.02
Agro-industry	0.00	0.00	1.00	0.00
Agriculture	-0.07	-0.03	-0.02	0.95
Sectoral	1.22	1.13	1.10	1.16
Landless farmer	0.01	0.01	0.01	0.01
Small landowner farmer	0.02	0.03	0.02	0.02
Large landowner farmer	0.03	0.05	0.03	0.04
Low-income non-farmer	0.06	0.09	0.06	0.07
Middle-income non-farmer	0.05	0.07	0.05	0.06
High-income non-farmer	0.04	0.05	0.04	0.05
Very high-income non-farmer	0.05	0.06	0.07	0.06
Corporation	0.16	0.20	0.26	0.22
Institutional/income	0.41	0.56	0.54	0.53

engenders substantial consumption linkages. The consumption creates a mass-market for products from any other sectors in the economy. Adelman (1984) and Mellor (1995) have suggested this route to industrialization with particular reference to agricultural sectors.

In the South Kalimantan Province, the data show that agriculture, with 0.53 of income linkage, is superseded by agro-industry with 0.54 (See Table 5 for details).

Like other sectors in the economy, agro-industry's forward linkages (1.17) are lower than their backward linkages (2.50). This fact may be interpreted to mean that agro-industry helps more in the demand generation for the products of other sectors in the economy, but is less helpful in stimulating other sectors to grow through the input they provide. This is understandable, as can be seen from the SAM model showing that most agro-industrial products are exported, rather than serving as the domestic intermediate input of other sectors.

Compared to other sectors in the economy, agro-industry has lower forward linkage (1.17). The highest forward linkage is for service (1.23), followed by industry (1.20). Agro-industry performs slightly better than agriculture which scored only 1.08 (Table 6). However, if these total forward linkages were disaggregated, agro-

industry would show a consistent performance. As in their backward linkages, agro-industry's forward linkages are strong both in value-added and in income effects. Its linkages for these types exceed the linkages of any other sectors. In contrast, agro-industry has weak inter-industry or sectoral linkages. These facts again indicate that agro-industry is more suitable for value-added generation and income improvement.

The share of exports in agro-industry's total output comprises 63.40%. This is significantly high compared to the shares of industry, service and agriculture, respectively, at 34.91%, 31.80% and 24.91% (Table 7). The share of industry is higher than agriculture as most crops in the South Kalimantan Province agriculture are rice and horticulture. These crops comprise 41% of the total agricultural products of South Kalimantan Province. The exported services are mostly in trade and transportation (Statistical Bureau of South Kalimantan Province, 2005) Industry dominates both exports and imports in the economy. Agriculture comes second while service and agro-industry are far behind (Table 7). Based on the shares in total exports and imports, it seems that industry and agriculture are more tradable. Services and agro-industrial enterprises are small-scale and informal. They are managed as family business, using family labor, simple technology, and less

Table 6. Forward Linkages in South Kalimantan Province

Description	Industry	Service	Agro-industry	Agriculture
Labor	0.00	0.00	0.01	-0.01
Non-labor	-0.01	0.01	0.01	-0.02
Factorial/value added/GDP	-0.00	0.01	0.01	-0.03
Industry	1.27	0.24	0.16	0.20
Service	0.01	1.01	0.01	0.01
Agro-industry	0.00	0.00	1.00	0.00
Agriculture	-0.07	-0.06	-0.04	0.95
Sectoral	1.21	1.19	1.12	1.16
Landless farmer	0.00	0.00	0.00	0.00
Small landowner farmer	0.00	0.00	0.00	-0.00
Large landowner Farmer	0.00	0.00	0.01	0.00
Low-income non-farmer	0.00	0.00	0.00	-0.02
Middle-income non-farmer	0.00	0.00	0.00	-0.00
High-income non-farmer	-0.00	0.01	0.01	-0.01
Very high-income non-farmer	-0.01	0.01	0.01	-0.03
Corporation	-0.00	0.00	0.00	-0.00
Institutional/income	-0.01	0.02	0.03	-0.05
Total	**1.20**	**1.23**	**1.17**	**1.08**

Table 7. Export, Import and Output in South Kalimantan Province

Description	Industry	Service	Agroindustry	Agriculture	Total
Export	7619151	721855	05554	1977603	10424163
Import	4965905	197303	5861	709548	5878617
NE (million rps)	2653245	524553	99692	1268056	4545546
Sectoral Output	21828945	2269998	166480	7939868	32204391
NE(% of Sectoral Output)	12.16	23.11	59.88	15.97	14.11
Export Share	34.91	31.80	63.40	24.91	32.37
Import Share	22.75	8.69	3.52	8.94	18.25
Export/Import	22.75	8.69	3.52	8.94	18.25
Export/Import	1.53	3.66	18.01	2.79	1.77
Share in Output	67.78	7.05	0.52	24.65	100.00
Share in Total Export	73.09	6.92	1.01	18.97	100.00
Share in Total Import	84.47	3.36	0.10	12.07	100.00

Export and Import refer to transactions across the boundary of South Kalimantan Province. In this regard, the selling or buying of products to or from other provinces is included as export or import.

NE (Net Export)   = Export - Import
Export Share   = (Export/Total Sector) *100%
Import Share   = (Import/Total Sector)*100%
Share in Output   = (Total Sector/Total)*100%
Share in Total Export = (Export/Total Export)*100%
Share in Total Import = (Import/Total Import)*100%

capital with small profit. Their business orientation is geared more to meeting the family's sustenance needs rather than generating maximum profit (Anwar 1991; Nasution 1991). By the nature of their operations and the size of their output, agro-industry and service expectedly figure as the less tradable sectors.

However, in terms of the net export (NE) value, agro-industry shows some promise. In absolute terms, agro-industry's output share comes up to a measly 0.52% of total output in the economy. However, in term of its own output percentage, it registers the highest NE value (59.88%) among all the sectors of the economy. Furthermore, for export and import share in total sectoral output, agro-industry turned in the best performance. Its export share comprises 63.40%, while its import's share takes up only 3.52% of the total sectoral output. In comparison, industry has a 34.91% export share, and 22.75% import share. Therefore, based on the ratio of export over import, agro-industry scores far better at 18.01, whereas the ratio for industry is only 1.53 (Table 7).

The findings above imply that agro-industry holds good potential for trading—either with other countries or within provinces—and is less vulnerable to external shocks. This confirms the previous finding pointing to agro-industry's value in trade (Alexandratos 1995; Anwar 1991; Paukert et al. 1981). Because of the small size of its output, its exports may not make a dent in the market. However, once development strategies are crafted to promote the increase in its output, its exports will likely increase significantly.

THE ROLES OF AGRO-INDUSTRY IN INCOME EQUALITY IMPROVEMENT

Table 8 shows the summary of all multipliers in the economy of South Kalimantan Province, when an injection is given to any endogenous account in the economy. Among the four sectors in the economy, agro-industry is in the second place with 0.54 of total income (institution) multiplier (see Table 8). Focusing the income multiplier on poor households only, the results reveal that service and agriculture are more favorable. These two sectors have higher multipliers, respectively at 0.13 and 0.11. Agro-industry and industry have the same lower multiplier (0.09). These facts

seem to contradict earlier findings contending that the development of agro-industry is suitable for poor households (Anwar 1991; Giovannucci 2001; Hayami and Kikuchi 1987; Reardon et al. 1994). However, upon careful examination of the results, one can conclude quite confidently that agro-industry does have some good influence in improving income distribution flows in the South Kalimantan Province.

As our findings would show, the income multiplier for agro-industry would affect household income at only 0.09 of poor households, 0.08 of medium households and 0.11 of rich households. This structure seems to benefit the rich households more. However, it must be noted that most of agro-industry's income multiplier goes to corporations (0.26). This is far higher than agro-industry's multipliers for the households, and it is higher than the other sectors' multipliers for corporations. Meanwhile, the increase in income for the corporations will have its own effects on households. As also depicted (Table 8), it is obvious that among households in South Kalimantan Province, the corporation income multiplier has the most effect on the poor households (0.02). This is caused by the fact that most corporations in South Kalimantan Province are small-scale and labor-intensive. The other reason is that most agro-industries are small-scale and household-run businesses. Therefore, agro-industries must be contributing significantly to the improvement of income for the poor, just like agriculture, which has higher income multiplier for the poor.

The path to creating a more equitable society is largely paved by efforts to reduce the income gap between the rich and the poor households. Certainly, the income of poor households needs to be increased. Based on the multiplier summary (Table 8), the poor would benefit the most from the income multiplier if exogenous injections are given to the landless farmers (1.02), small landowner farmers (1.01) and low-income non-farmers (1.01). However, the injections in the economy will affect not only the income of the poor households, but also the incomes of all endogenous accounts (factors, sectors, corporation and other household levels). High-income households often play important roles in agro-industrial development. They can function like an engine that can jump-start all the lower-income households involved in the business.

Table 8. Income Multiplier Effects of Injection on Sectors and Corporation in South Kalimantan Province

Injection	Multiplier Total	Factor	Sector	Inst.	Poor	Medium	Rich	Corp.
Labor	2.065	1.007	0.029	1.029	0.416	0.395	0.217	0.002
Non-Labor	1.588	0.996	0.003	0.589	0.079	0.064	0.118	0.327
Industry	2.24	0.607	1.222	0.411	0.089	0.079	0.084	0.16
Service	2.496	0.809	1.126	0.561	0.129	0.115	0.115	0.203
Agro-industry	2.497	0.855	1.103	0.539	0.094	0.08	0.109	0.255
Agriculture	2.489	0.797	1.161	0.53	0.109	0.096	0.108	0.217
Landless farmer	1.033	0.016	-0.031	1.048	1.017	0.014	0.014	0.004
Small landowner farmer	1.087	0.01	0.049	1.028	1.01	0.008	0.008	0.003
Large landowner farmer	1.078	0.016	0.025	1.037	0.012	1.01	0.01	0.004
Low-income non-farmer	1.09	0.007	0.051	1.032	1.011	0.009	0.009	0.002
Middle-income non-farmer	1.079	0.012	0.04	1.027	0.009	1.007	0.007	0.003
High-income non-farmer	1.016	-0.007	0.005	1.018	0.008	0.006	1.006	-0.002
Very high-income non-farmer	0.893	-0.055	-0.034	0.982	-0.001	-0.001	0.998	-0.015
Corporation	1.059	0	0.001	1.058	0.021	0.017	0.017	1.003

Injection is an intervention to increase or reduce the amount of a particular endogenous account through an increase or reduction in exogenous account expenditure. For example, a one-unit increase in government expenditure on labor improvement will result in 2.065 units of increase in total endogenous account, consisting of increases amounting to 1.007 units in the factor account, 0.029 units in the sector account and 1.029 units in the institution account.

For example, in the coconut cake industry, a high-income household provides capital for 43 lower income households in a village, and receives all their products. This high-income household plays multiple roles, among them, as financier and as a trader, who collects from, and re-sells products to the community.

The critical point is that the authorities concerned should be able to grasp the reality in the field and to provide the appropriate follow-up action needed to accelerate the development of agro-industry. Coordination between various stakeholders has to be developed. This cooperation can be sustained only if both sides are benefited. In this case, the high-income household derives its benefit from the successful investment and the lower-income households gain in terms of additional income.

An injection to agro-industry generates the highest value for total multiplier effects (2.497). This indicates that although agro-industry has less multiplier effects on the incomes of the poor households, it has far higher multiplier effects for value-added and output. If the three types of multipliers (output, value added and income) are taken into account simultaneously, then agro-industry scores the better performance, making it the wiser choice as a target for development.

Among the factors of production, labor is a better target for injection than capital if income increase is the purpose, since labor generates higher income multipliers (1.03) than capital (0.59). However, the fact that agro-industry occupies only a small share of the economy has to be brought in consideration as well. These facts indicate that South Kalimantan Province first needs to expand the development of agro-industry, before focusing on labor in order to improve income structure and to spur growth.

In relation to this, agro-industry can be counted on to support labor development. Agro-industry is the sector with the highest (15.59) labor productivity (see Table 4). It can absorb superfluous labor from sectors with low productivity. Therefore, agro-industry helps to smooth over the transformation process (Nasution 1991) and facilitates ways to transfer resources from agriculture to non-agriculture (Eicher and Staatz 1984). These roles, according to Johnston and Mellor (1995) are necessary for accumulating and self-sustaining

growth. High productivity could also imply a high wage rate, which helps the economy to keep the resources in the region, prevent urbanization, and increase the income for labor; this finding definitely confirms previous arguments that the process helps foster rural development (Solahuddin 1999; Suryana et al. 1998).

DEVELOPING THE POTENTIALS OF AGRO-INDUSTRY

In the 1980s, Indonesia's economic growth decelerated as a result of fluctuations in the world's economy. During that period, domestic sources of income were progressively moved from gas and oil to others, especially to the primary sector. Primary products were given more attention in order to support their processing for export. However, the primary sector's growth can not be accelerated without considering the close relationships of farm production, and the processing and marketing systems. Yet, trends so far have shown that Indonesian agricultural commodities have difficulty penetrating the international market, and commodities are commonly exported in the form of raw materials. In reality, however, the international demand for the processed products is quite large. One industry which is most suitable to meet this demand is agro-industry.

A number of researches have shown the wisdom in the development of agro-industrial sectors. In terms of their multiplier effects, these sectors can better augment the incomes of the poor people (Luthfi 2003). These sectors can create the pathways to connect the primary sectors to the secondary sectors and thus ensure that the economic transformation process takes place smoothly (Nasution 1991). In addition, these sectors, especially the small- and medium-scale enterprises, can function as vehicles for income generation for the poor in rural areas (Hayami and Kikuchi 1987; and Anwar 1991). Agro-industry has also been seen to be crucial in creating some positive externalities for society in general and helping small-scale farmers to survive (Schejtman 1994).

As earlier mentioned, agro-industries can serve as intermediaries in the economic development process, between traditional sectors which are primarily small-scale farms, and secondary sectors which are industrial and manufacturing

firms (Nasution 1991). As an example, in South Kalimantan, many people who were previously only into the selling of coconuts can now benefit from significant value added once they embark on the production of coconut oil. In fact, aside from generating additional income for the poor, agro-industries can employ the services of the unskilled, as the earlier findings of Hayami et al. (1987) bear out.

In this coconut oil production, many of the farmers can be involved in the process. They can serve as fruit gatherers or work in the factory as laborers. Basically they only need a short training in order to take part in this venture.

Finally, agro-industries also contribute quite significantly to preventing poor farmers from losing their main income sources. Based on the general survey covering the twelve districts of South Kalimantan Province, the agro-industries comprise a total of 17,881 units, categorized into 29 types. Of the total, 529 are large-scale units, 1,445 units are medium scale and 15,907 units are small-scale agro-industries. Given this profile, it is apparent that small farmers would be greatly benefited if given the opportunity not only to sell their produce, but more importantly, to process their own agricultural products to acquire value added. Agro-industries provide a vehicle by which small-scale agriculture can survive.

The leading agro-industries of South Kalimantan Province are engaged in the processing of coconut oil, coffee powder, brown sugar, salted fish, and coconut cake (Badan Perencanaan Pembangunan Daerah [Regional Development Planning Agency] of South Kalimantan Province, 2002). These agro-industries registered the best performance in terms of their financial, regional and distributional aspects. Needless to say, the development of the agro-industry inevitably needs support from external sources especially in providing fund for investment or initial capital. This is where the role of high-income households proves to be critical in spearheading such growth.

Some of the successful ventures provide valuable lessons about the importance of external support to small-scale agro-industrial development. The Participatory Integrated Development in Rain-fed Area (PIDRA) is one example of a successful government-run program. The program helps poor farmers by providing funds for infrastructure, resource quality improvement, and capital. The first phase has been successful, and it is now implementing the second phase. The people-nucleus-estate model is another example. This scheme is observed in several agricultural commodities, including rubber, oil palm, sugarcane, and poultry. Basically, business is based on partnerships. The nucleus provides inputs, technological support, and a market for outputs. The people or farmers provide labor and produce the output. This scheme works well in South Kalimantan, particularly in developing the oil palm agribusiness.

To actualize all the potentials that agro-industry has, the challenge lies in formulating and implementing a strategy for agro-industrial development. The strategy should address the many constraints faced in agro-industrial development by making start-up funds more easily available; lowering the transaction costs of private business to enter agro-industry; fostering cooperation and coordination between the government, private sectors and nongovernmental organizations; and upgrading the human resources, among others.

CONCLUSIONS AND POLICY IMPLICATIONS

Although the contribution of agriculture to GDP and employment inevitably decreases along with economic growth, agriculture could in fact assume a more prominent role. Unlike in the past, agriculture is no longer considered as a passive sector, from which resources are squeezed and extracted to support other sectors. Instead, it is believed that agriculture has significant roles in accumulating and self-sustaining growth. It is seen as wielding a major influence on industrialization and economic growth.

One possible strategy to enhance the growth not only of the agricultural sectors but even the entire economy is by developing agro-industry, a rural-based industry with business characteristics, which processes agricultural products. Agro-industry has a strategic role to play in development and has wider effects on family welfare and rural community. It can enhance growth and equity improvement at the same time. Agro-industry serves as a bridge for economic transformation, generates employment, supports development in rural areas, prevents

urbanization, improves the incomes of the poor, ensures food security, and helps small farmers to survive.

This paper has tested previous findings on the important role of agro-industries, by using empirical data that are organized in a Social Accounting Matrix (SAM) framework. The SAM was constructed from data on the South Kalimantan Province of Indonesia, with particular focus on agro-industries and households. Data were analyzed using mixed multipliers which were formulated based on the SAM. The results revealed that agro-industry was suitable for maintaining economic growth while helping poor farmers improve their welfare.

Agro-industry had the highest value-added share in input and the highest value-added multiplier compared to other sectors in the economy. Agro-industry was shown to be a productive sector with high labor productivity and total factor productivity. Its linkage values showed that despite its minimal linkages in terms of input provision for other sectors, agro-industry had higher linkages for value added generation and income improvement. Its export-import structure was in good shape, registering the highest net export and the highest ratio of export-import. The analysis also revealed that through the accumulation of direct and indirect multiplier effects, agro-industry helps the poor households to earn more income. These findings confirmed that agro-industry held some potential for income equality improvement and growth promotion in the South Kalimantan Province. However, given its minuscule share of the economy at present, the first step needed is to develop agro-industry so as to tap its benefits. This can be achieved through the improvement of human resources and technology, together with sound policies intended to encourage investment, improve product quality, and attain consistency in production.

REFERENCES

Adelman, I. 1984. "Beyond Export-led Growth". *World Development,* 12:. 937-949.

Adjid, D.A. 1995. "Agribusines sebagai Acuan Tata Nilai Masyarakat Pedesaan dalam Menghadapi Globalisasi dengan Pasar Bebasnya [Agribusiness as the Framework of Rural Community Value in Facing Globalisation and Free Market]". Research Report. Badan Agribusines Departemen Pertanian, Jakarta.

Adjid, D.A., S. Sumarto, S. Mawardi, and R. Montgomery. 1998. "Constraints on, and Opportunities for Further Growth in Agriculture". Jakarta: Lembaga Bangun Desa Sejahtera and P.T. Multi Tehniktama Prakarsa Hunting Technical Services Ltd.

Alexandratos, N. 1995. *World Agriculture Towards 2010: an FAO study.* Food and Agriculture Organization of the United Nations. New York: Wiley.

Anderson, K. 1987. "On Why Agriculture Declines with Economic Growth". *Agricultural Economics,* 1: 195-207.

Anderson, K. and Y. Hayami. 1986. *The Political Economy of Agricultural Protection: East Asia in International Perspective.* A publication of the Australia-Japan Research Centre, Australian National University, Sydney. Sydney: Allen & Unwin.

Anderson, K. and M. Pangestu. 1995. "Agriculture and Rural Development in Indonesia into the 21st Century". Research Report. Centre for International Economic Studies, Adelaide.

Antle, J.M. 1999. "The New Economics of Agriculture". *American Journal of Agricultural Economics,* 81: 993-1010.

Anwar, A. 1991. "To Form the Fundamentals of Sustainable Agricultural System to Improve the Self Sustainability of the Nation". Paper presented at the Seminar on "Agricultural Development Strategy for The Second Stage of Long-term Development", held 28 October 1991 in Bogor.

Austin, J.E. 1981. *Agroindustrial Project Analysis.* A publication of the Economic Development Institute of the World Bank. Baltimore: Johns Hopkins University Press.

Babu, S. 2000. "Food and Agricultural Policies for the 21st Century". Paper presented at the First World Congress of the World Agricultural Forum, held in St. Louis, Missouri, 23-25 May 1999. Also appears in *Food Policy,* 25: 105-109.

Badan Perencanaan Pembangunan Daerah [Regional Development Planning Agency] of South Kalimantan Province. 2002. "Leading Agroindustry in South Kalimantan Province". Research report done in collaboration with Lambung Mangkurat Research Centre. Banjarbaru.

Bahri, S., A. Suryana, and Erwidodo. 1998. "Implications of Indonesia's Monetary Crisis for Agroindustry Development". *Proceedings.* Third Workshop of the ACIAR Indonesia Research Project on "Agriculture, Trade and Environment", held 24-25 February 1998 in Adelaide.

Eicher, C.K. and J.M. Staatz. 1984. *Agricultural Development in the Third World*. Baltimore: Johns Hopkins University Press.

Fei, J.C. and G. Ranis. 1961. "A Theory of Economic Development". *American Economic Review,* 4: 533-565.

Giovannucci, D.P., 2001. Introduction. The Guide to Developing Agricultural Markets & Agro-Enterprises. Washington DC: The World Bank. [on-line].

Harris, J.R. and M.P. Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis". *American Economic Review,* 60:. 125-142.

Hayami, Y., and M.I. Kikuchi. 1987. *Rural Economic Dilemma*. Jakarta: Yayasan Obor

Hirschman, A.O. 1958. *The Strategy of Economic Development*. New Haven: Yale University Press.

Holt, T. and S. Pryor. 1999. *Agribusiness as an Engine of Growth in Developing Countries*. Office of Emerging Market, USAID. Washington D.C.

Hsu, S. 1997. "The Agroindustry: A Neglected Aspect of the Location Theory of Manufacturing". *Journal of Regional Science,* 37: 259-274.

Johnson, D.G. 1991. "Knowledge, Technology and World Food Security". Research Report. University of Chicago.

Johnston, B.F. and J.W. Mellor. 1995. *The Role of Agriculture in Economic Development.* Aldershot, UK: E. Elgar ; Vt., USA: Brookfield.

Jorgenson, D.W. 1961. "The Developement of a Dual Economy". *Economic Journal,* 71: 309-334.

Kinsey, B.H., 1987. *Agribusiness and Rural Enterprise*. London: Croom Helm

Lewis, B.D. and E. Thorbecke. 1992. "District-Level Economic Linkages in Kenya: Evidence Based on a Small Regional Social Accounting Matrix". *World Development,* 20: 881-897.

Lewis, W.A. 1954. "Economic Development with Unlimited Supply of Labour". *Manchester School of Economics*, 26: 139-191.

Lewis, W.A. 2000. *Development Strategy in a Limping World Economy*. New York: Oxford University Press.

Luthfi, F. 2003. "The Roles of Agroindustry in the Improvement of Regional Economy and Income Distribution of South Kalimantan Province, Indonesia". Ph.D. Thesis submitted to the University of Adelaide.

Manwan, I., K. Suradisastra, S. Mawardi, R. Montgomery, and D.A. Holmes. 1998. "Agriculture and Development in Eastern Indonesia". Research Report. Jakarta: Lembaga Bangun Desa Sejahtera and P.T. Multi Tehniktama Prakarsa Hunting Technical Services Ltd.

Mellor, J.W. 1995. *Agriculture on the Road to Industrialization*. Baltimore: Johns Hopkins University Press.

_____. 1984. *Agricultural Development and the Intersectoral Transfer of Resources*. Baltimore: Johns Hopkins University Press.

Nasution, L.I. 1991. "Formulation of Indonesia's Structural Economic Transformation to Increase the Efficiency of Agricultural Sector". *Seminar Proceedings*. Agricultural Development Strategy for the Second Stage of Long-Term Development, held 28 October 1991, Bogor.

Paukert, F., J. Skolka, and J. Maton. 1981. *Income Distribution, Structure of Economy and Employment: The Philippines, Iran, the Republic of Korea and Malaysia*. Published by the International Labour Office and World Employment Programme. London: Croom Helm.

Reardon, T., A. Fall, V. Kelly, C. Delgado, P. Malton, J. Hopkins and O. Badiane. 1994. "Is Income Diversification Agriculture-led in the West African Semi-arid Tropics?" *The Nature, Causes, Effects, Distribution, and Production Linkages of Off-farm Activities.* African Economic Research Consortium, Nairobi, Kenya.

Rich, K.M., A.W. Nelson, and G.C. Nelson. 1997. "Political Feasibility of Structural Adjustment in Africa: An Application of SAM Mixed Multiplier". *World Development.* 25: 2105-2114.

Rosentein-Rodan, P.N. 1943. "Problems of Industrialization of Eastern and South-Eastern Europe". *Economic Journal*, 53:202-211.

Ruttan, V.W. and Y. Hayami. 1984. *Induced Innovation Model of Agricultural Development.* Baltimore: Johns Hopkins University Press.

Schejtman, A. 1994. "Agroindustry and Changing Production Patterns in Small-scale Agriculture". *Cepal Review*, 53:147-157.

Scitovsky, T. 1954. "Two Concepts of External Economics". *Journal of Political Economy*, 62:143-151.

Solahuddin, S. 1999. "Keynote Address". *Seminar Proceedings.* Indonesia Agricultural Sector during Turbulence of Economic Crisis: Lessons and Future Directions, held 17-18 February 1999, in Bogor.

Staatz, J.M. and C.K. Eicher. 1984. *Agricultural Development Ideas in Historical Perspective*. Baltimore: Johns Hopkins University Press.

Statistical Bureau of South Kalimantan Province, 2005. South Kalimantan in Numbers. Annual Publication. Banjarmasin.

Suryana, A., S. Bahri, Wahida, and R. Trewin. 1998. "Key Agricultural and Agribusiness Policy Issues in Indonesia". Research Report. Center for Agroeconomic Research (CASER), Bogor.

Yanuar, B.P. 2005. "Pengaruh Bantuan Langsung Masyarakat terhadap Kesejahteraan Petani (in Indonesian). [The Impact of Direct Targeting Support Toward Farmer Welfare]". Bachelor Thesis submitted to the Faculty of Agriculture, Lambung Mangkurat University, Banjarbaru.