AGRIBUSINESS ROLE IN INDONESIA'S ECONOMY

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Abstract:

The purpose of this study is to analyze:a) the role of the agribusiness sector in the economy through the structure of Gross Added Value, output distribution, income distribution and labor, b) to analyze the output multiplier, income and labors multiplier, and c) to analyze backward and growing linkages of agribusiness sector to other sectors in the Indonesian economy. This research utilises Input Output Analysis to Table I-O Indonesia Updating 2011 based on table of Domestic Transaction of Producer Price in 2011 classification from 66 sectors aggregated into 37 sectors.

The results showed that the agribusiness sector contributed 28.18% to the Gross Added Value. In terms of Output and Income Distributions, agribusiness sector contributed 27.93% and 22.46% respectively to the national economy, while in the labor distribution sector, the agribusiness sector absorbed 43.66% of the labor which was mostly concentrated in the farming system and paddy farming is the highest employer absorber. Furthermore, the agribusiness sector has a value of direct backwardness and indirectly growing number, higher than other sectors of the economy. In the direct linkage to the future, the agribusiness sector has a much lower value than other sectors, but in the indirect linkage in the future, the agribusiness sector has a higher value than other sectors. The distribution power index analysis and the degree of sensitivity show that the agribusiness sector has lower value than other sectors.

Keywords: multiplier effect, distribution power index, sensivity degree index.

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1.   Introduction

Currently, Indonesian agribusiness has been depended on the abundance of natural resources with characteristic of factors of production with unskilled labor where in the final production stage is still dominated by primary commodities that are identical with agricultural development. The development of agribusiness integrates simultaneously to the development of agricultural sector in a line with the development of industry and related services in an industrial cluster covering five sub-systems, namely: upstream agribusiness, farming / livestock, downstream agribusiness / processing, marketing and services.

Agribusiness development is the main driver of national economic development, based on consideration: (a) the economy is built on a competitive and comparative advantage as an agrarian and maritime country, (b) agribusiness is a major sector in the formation of Gross Domestic Product (GDP), employment and business opportunities included exports, (c) agribusiness is the main sector of the regional economy in the formation Regional Gross Domestic Product (RGDP), employment, business opportunities to support regional exports, (d) agribusiness system will inherently develop local food security, culture and institutional systems and e) agribusiness system development plays an important role in environmental conservation.

Potential development of Indonesian agribusiness is supported by: first, political decisions that mandate the development of agribusiness systems based on comparative advantage as an agrarian and maritime country. Second, the agribusiness system development accelerates the economic development of the region by utilizing available resources, as currently, almost all the regions of their economic structure (RGDP formation, labor absorption, employment opportunities, and exports) is about 80 percent are contributed by agribusiness. Third, the advantages of biodiversity richness of land and waters is available as well as relatively broad and fertile land, and the agro climate is conducive to the agribusiness. Fourth, the development of agribusiness system based on domestic resources, does not require imports and external financing (external debt). Fifth, products that have comparative advantages which are not possessed by developed countries, such as rubber, CPO into derivative products (detergents, soaps, palm oils), and others.

The development of Indonesian agribusiness has been relatively slow at only 47% in the 1997-1998 periods, but it grew by 52.5% during the economic crisis in 1998. The weakening of the rupiah against foreign currencies was caused by the weakening of the purchasing power in the sub-districts of Agro-industry sector through export penetration which has a competitive advantage on the selling price side.

After the economic crisis, agribusiness is seen as a fairly tough sector that has a prospect to develop even though it has not been optimally supported by the business world. The government seeks to encourage the business world with various policies in the field of investment by optimizing the role of banking sector in order to finance as well as the characterictic and system of agribusiness. One of them is palm oil business, that on farm system is supported by up stream agribusiness such as CPO processing, which is completed by research and human resources development, infrastructures and others.

The main problem has been headed by agribusiness system in Indonesia is : (a) the primary player on farming subsystem is big number of farmers on small scale and traditional life style with low innovation and creativity ideas and satisfied with their achievements, (b) the development of non agricultural industry sectors raise the conversion of productive agricultural land to be non agricultural land rapidly, so the tenure of farmers are decreasing, makes the farming system, inefficient, less of access to the market, capital, technology and information, (c) the diminishing of tenure forces the urban labors as the consequences of unemployment and non agricultural sectors provide it effectively.
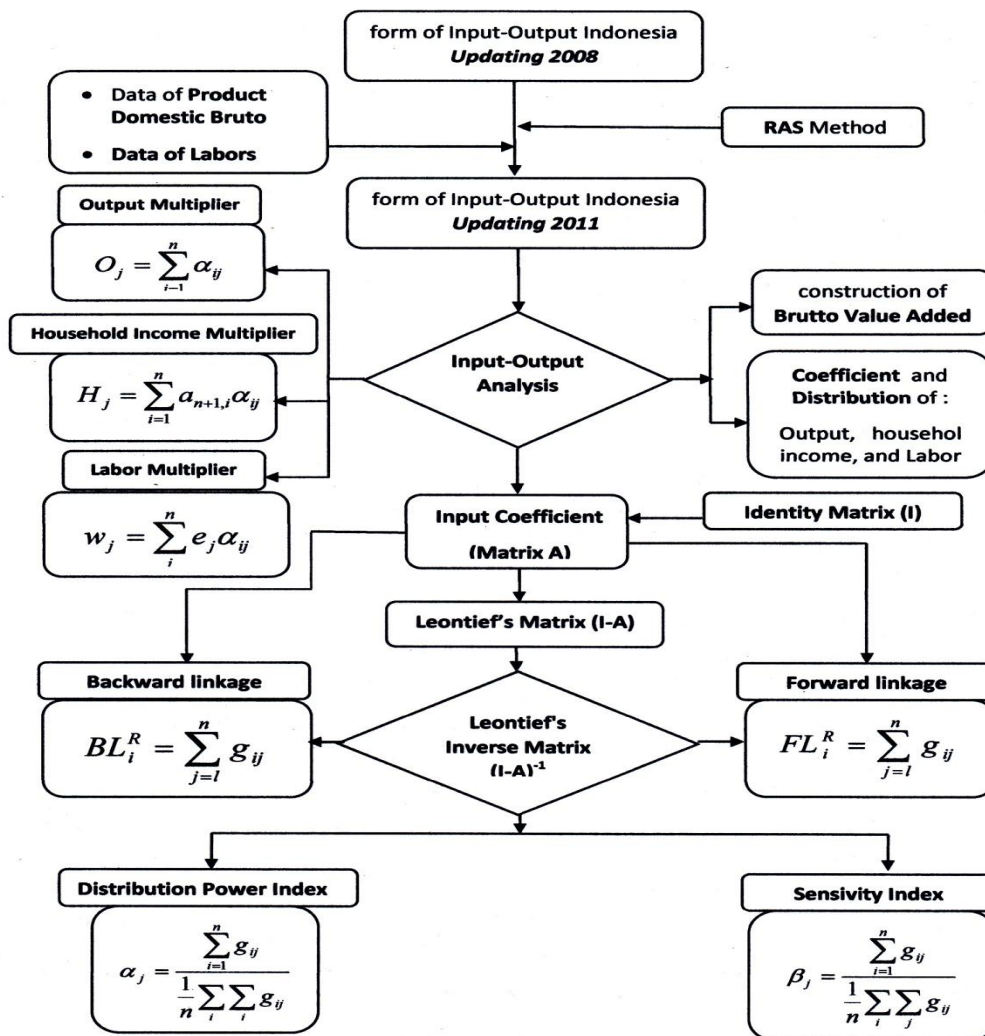
According to the above background, the difficulty can be arranged as follows :
(a)how far the agribusiness sector takes a role in Indonesian economy, especially in the construction of Brutto Value Added (BVA), output, income and labors distributions, (b) how far the multiplier effect may encourage agribusinness sector so that it implies towards output, household income, and labors, (c) how the linkages come up among sectors within agribusiness sector and other sectors in Indonesian economy.

2. Research Concept Framework Agribusiness system is a arrangement of activities that continuously work from upstream until downstream, so the success of the agribusiness development is very depended on the progress may achieve in every point as its subsystem.

Comprehensively, the five chains or subsystems can be described as follows: (a) Subsystem of production facilities, included procurement and distribution (b) Subsystem of farming or production processing, (c) Subsystem of agroindustry or production processing, (d) Subsystem of Marketing, included farming harvest and agroindustry production for both domestic and export market, (e) Subsystem of supporting activities, included pre and post harvesting.

The scheme of the research as follows :

form of Input-Output Indonesia
Updating 2008

- **Data of Product Domestic Bruto**
- **Data of Labors**

RAS Method

Output Multiplier

$$O_j = \sum_{i=1}^{n} \alpha_{ij}$$

form of Input-Output Indonesia
Updating 2011

Household Income Multiplier

$$H_j = \sum_{i=1}^{n} a_{n+1,i} \alpha_{ij}$$

Input-Output Analysis

construction of **Brutto Value Added**

Coefficient and **Distribution** of :

Output, household income, and Labor

Labor Multiplier

$$w_j = \sum_{i}^{n} e_j \alpha_{ij}$$

Input Coefficient (Matrix A)

Identity Matrix (I)

Leontief's Matrix (I-A)

Backward linkage

$$BL_i^R = \sum_{j=l}^{n} g_{ij}$$

Leontief's Inverse Matrix (I-A)$^{-1}$

Forward linkage

$$FL_i^R = \sum_{j=l}^{n} g_{ij}$$

Distribution Power Index

$$\alpha_j = \frac{\sum_{i=1}^{n} g_{ij}}{\frac{1}{n}\sum_i \sum_i g_{ij}}$$

Sensivity Index

$$\beta_j = \frac{\sum_{i=1}^{n} g_{ij}}{\frac{1}{n}\sum_i \sum_j g_{ij}}$$

On this research, hypotheses are proposed: (1) Multiplier effect of output, income and labors in the sector of agribusiness is higher than other sectors on Indonesian economy, (2) The forward linkage and the backward linkage in agribusiness sector is higher than other sectors in Indonesian economy.

3. Methodology

This type of research is descriptive quantitative, based on secondary data, journals and articles related to research problems. The data used is secondary data, in the form of Input-Output Indonesia 2011 that is updating by using RAS method from basic data of input - output 2008 sourced from BPS Indonesian Statistics Center and National Economic Social Survey (SUSENAS). It also used macroeconomic and sectional data sourced from national institutions (Ministry of Agriculture and related institutions) and other sources.

Factors analyzed in this research are:

a. Contribution of agribusiness sector

The role or contribution of the agribusiness sector is calculated by searching sectional contributions, i.e. calculating the role of sectors and sub-sectors in the agribusiness on the economy (the role of the overall economic sectors) in percentage units.

b. Multiplier Effect

The multiplier effects calculated are output from output, household income, and labors, by the notation of α_{ij} on matrix of Leontief's inverse matrix. The calculated results are persented by this way:

b.1. Output Multiplier

The multiplier of output in sector j, by the notation of O_j, is formulated as follows :

$$O_j = \sum_{i=1}^{n} \alpha_{ij}$$

where :

O_j : the magnitude of output multiplier from sector j output multiplier from

sector

α_{ij} : is a matrix element on Leontief's inverse matrix $(I-A)^{-1}$.

b.2. Household Income Multiplier

The multiplier of household income in the sector j, by the notation of H_j, and it is formulated as follows:

$$H_j = \sum_{i=1}^{n} a_{n+1,i}\alpha_{ij}$$

where :

H_j : the magnitude of household income multiplier from sector j

$a_{n+1,i}$: the coefficient of household income in sector j

α_{ij} : is a matrix element of Leontief's inverse matrix $(I-A)^{-1}$.

b.3. Labor Multiplier

The multiplier of Labor sector j, denoted by w_j, is formulated as follows:

$$w_j = \sum_{i}^{n} e_j\alpha_{ij}$$

where:

w_j : labor multiplier on sector j

e_j : labor coefficient in sector j

α_{ij} :is a matrix element of Leontief's inverse matrix $(I-A)^{-1}$.

c. The inter-sectional linkages

There are inter-sectional linkages among them in the economy, obtained by measuring backward and forward linkages, as well as measuring distribution power and sensivity indexes, with in detail as in the following formulas:

c.1. Backward linkage, calculated by this formula:

$$BL_i^R = \sum_{j=l}^{n} g_{ij}$$

where:

BL_j^R : is a measure number of backward linkage

g_{ij} : is a matrix element of Leontief's matrix, $G = (I\text{-}A)^{-1}$

c.2. Forward linkage calculated by this formula:

$$FL_i^R = \sum_{j=l}^{n} g_{ij}$$

where:

FL_i^R : is a measure number of forward linkage

g_{ij} : is a matrix element of Leontief's matrix, $G = (I\text{-}A)^{-1}$

c.3. Distribution Power Index, calculated with the following formula:

$$\alpha_j = \frac{\sum_{i=1}^{n} g_{ij}}{\frac{1}{n}\sum_{i}\sum_{j} g_{ij}}$$

where :

α_j : distribution power index from sector j in the economy

g_{ij} : is an element on Matrix of Leontief, $G = (I\text{-}A)^{-1}$

c.4. Sensivity Index, calculated by the formula as follows :

$$\beta_j = \frac{\sum_{i=1}^{n} g_{ij}}{\frac{1}{n}\sum_{i}\sum_{j} g_{ij}}$$

where :

β_j : is sensivity index from sector i in the economy

g_{ij} : is an element on Matrix of Leontief, $G = (I-A)^{-1}$

4. Results and Discussion

The contribution of the agribusiness sector to the Gross Added Value (GAV) of Indonesia in 2011 was 28.18% or Rp.2,037,086,406, where the downstream agribusiness subsystem has 14.30% contributed and fisheries sector became the highest contributor (3.14%). Furthermore, on the output distribution side, the contribution of agribusiness sector is 27.93% or Rp. 4,378,457,111, where the downstream agribusiness subsystem contributes the highest (16.51%) and the textile, clothing and leather industry sectors are the highest contributor (2.25%). In terms of income distribution sourced from wages and salaries, the agribusiness sector contributed 22.46% or Rp.520,947,606 where the downstream agribusiness system remained the highest contributor (12.49%) and the rubber and plastic industry contributed to the highest value (2.79%). In the labor distribution, agribusiness absorbed 43.66% of the workforce, or 47,220,885 people, while 36.19% were concentrated in the primary agricultural or agricultural subsystem in rural areas, and the rice sector was the highest employer (7.53%) or 8,139,658 workers.

Income multiplier in the agribusiness sector is 1.808, higher than other income multiplier from other sectors (1.640), while rice milling industry has the highest (3.996), means that an addition one unit of end demand on rice milling, it will multiply the income of house-hold of 3.996. On labor multiplier, agribusiness sector has value of 2.626, much higher than other labor multipliers at other economy sectors (1.895), where rice milling industry has a very high value (15.498). This indicates that a unit of end demand money in rice milling industry, can raise demand of 15 labors at that industry.

The analysis of multiplier effect on output side showed 1.631 for output multiplier, a slightly higher than the average of the other sectors output multiplier (1.592) in the economy, where the rubber and plastic industry has the highest output multiplier (2.788), which means that as a result of an additional one unit of final demand money in the sector, it will increase output sector by 2.78 units of money. The aggregate sector of income multiplier is 1.808, higher than the other sectors such as income multiplier (1.640) in the economy, where the rice milling industry has the highest value (3.996), which means that with an additional unit of money, the final demand in the rice milling sector will double the house-hold income of 3.996. In the labor multiplier, the agribusiness sector has a value of 2.626, which is much higher than the other labor sectors at the economy (1.895), where the rice industry sector has a very high rate (15.498). This indicates that the effect of a unit of money can change the final demand in the rice milling sector or it will increase the demand for 15 workers in the sector.

The agribusiness sector has a value of backwardness (0.384), higher than the value of backwardness from other economic sectors (0.375), where the rubber and plastic industry has the highest value (1.073). It means that if there is an increase of one unit of output money in the sector, it directly increases the production input by 1.073 units. In the value of indirect linkage, the agribusiness sector has a value of 1.247 higher than the average value of other economic sectors (1.217), where the rubber and plastic industry has the highest value (1.712). The value of future linkage in agricultural sector is 0.280, much lower than the value of future economic linkage (0.508). The fertilizer and pesticide industry have the highest forward value (1.295).

Average Power Index in the distribution of agribusiness sector was 0.977, lower than other sectors in the economy (1.029). Distribution power index is above the average; and the highest compared to other sectors within the scope of agribusiness sector, is in the industrial sector of flour with all its types (1.273), which means that the sector is relatively able to meet the demand as it is above of the average ability from other sectors. The Sensitivity Index shows that the agribusiness sector has value of 0.840, much lower than the sensitivity index value of other sectors in the economy (1.205). From all values, the fertilizer and pesticide industry has the highest value (1.789), which places the fertilizer and pesticide industry as a strategic sector that can relatively meet the demand which is above of the average capacity from other sectors.

5. Conclusions

The contribution of agribusiness sector to Gross Added Value is 28.18%; the downstream agribusiness subsystem and the fishery sector become the highest contributor. On the distribution side, the contribution of the agribusiness sector contributed 27.93%, whereas the downstream agribusiness subsystem and the textile, clothing and leather industry gave the highest contribution. On the income distribution, agribusiness sector contributes 22.46%, so the downstream agribusiness, rubber and plastic industries become the highest contributors. In the labor distribution, agribusiness absorbs 43.66% of the workforce and largely concentrated in the farming subsystem and the rice sector is the highest employer absorber.

The agri-business output multiplier is 1.631, slightly above the average of the outtput multiplier of other sectors (1.592) in the economy. The highest output multiplier is rubber and plastic industry. On the income side, the agribusiness sector has a multiplier of 1.808, higher than the income multiplier of other sectors in the economy (1.640). Similarly, in the labor multiplier, agribusiness sector has multiplier of 2.626, much higher than the other sectors in the economy (1.895). From income and labor multipliers, rice milling sector dominates with the highest contribution, respectively 3.996 and 15.498.

According to interrelationship of the agribusiness sector with other sectors in the economy, the agribusiness sector has a value of direct and indirect backwardness, which is higher than other sectors in the economy and the highest contribution to the value of backwardness is rubber and plastic industry.

Furthermore, on the value of Distribution Power Index and Sensitivity Index, the agribusiness sector has much lower value than other sectors in the economy. On the value of Power Index Distribution of the flour industry with all its types gave the highest contribution, while on the Sensitivity Index, the highest value was contributed by fertilizer and pesticide industry.

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