Land priority area for agribusiness development based on human and economic resources in Central Java

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Abstract. The agricultural sector is the main sector almost in every region in Indonesia and also in Central Java. The agricultural sector needs more land for agribusiness development. Agribusiness development referrals are away on making use of those potentials. This study aims to determine the land priority area for agriculture development based on human and economic resources in Central Java using DR (Dependency Ratio), LP (Labour Productivity), LQ (Location Quotient), Food Security, and Land Carrying Capacity (LCC) and the analysis using SWOT method. The results showed the DR < 50, and the labor productivity in the industrial sector is greater than the agricultural sector. The GDP of the industrial sector is greater than the agricultural sector, in which the value of LQ > 1, where the agricultural sector is the main sector and the agribusiness sector is expected to improve the welfare of the population through poverty reduction and the increase of HDI in Central Java.

1. Introduction
Agriculture is a human activity in utilizing the natural environment, agribusiness is a sector which utilizes agriculture potential and can increase production result [1]. Agricultural land utilization can be affected by production factors such as land, modal/capital, labor, and management skill which is controlled by the farmer. Agriculture as a system which is specially defined by the natural environment and specific social economy process including the characteristics, orientation, and specific agricultural effect on land use.

Central Java which has a stable area of land with a high population growth will decrease the availability of agricultural land as shown in figure 1, the total area of agricultural land is getting smaller. If it remains like this, then there will be a population imbalance that works as farmers in a region with the existing agricultural land. As a result, population pressure on agricultural land will be higher [2,3]. This condition shows that the need for arable land is increasing, while the area of land is limited, thus the land capability to support life is also limited [4].
The role of agricultural sector in a development is considered to be passive and only considered as a supporting factor because of the high potential of the agricultural sector which hasn’t been maximally utilized [5]. The role of agriculture in the eyes of society is only limited to the source of labor and cheap foodstuffs as supporting in the industrial sector which is generally considered as a leading sector in development. However, it is realized that the rural area and agricultural sector are no longer considered to be passive but their roles are important as a supporting factor because agricultural sector is a key for industrial sector as a raw material supplier in industrial sector and if it is developed further, the production of agricultural sector will reach maximum amount and produce other consumer goods which have more value than only as other sector’s supporting. It needs an effort to raise agricultural sector because it is not only as a supporting but as a key for other sectors [6].

The Agricultural sector is a leading sector almost in every region in Indonesia and also in Central Java. Agricultural sector is a leading sector in Central Java due to several reasons [7]. First, most of Central Java population still live around agricultural sector or rely their life on activity related to agriculture whether it is direct or indirect. Second, Central Java cannot possibly catch up to compete with developed countries to produce industrial products in international market. Third, the agricultural sector’s strength in facing the economic fluctuation compares to any other sectors in facing the economic fluctuation. Forth, the agricultural sector big contribution for industrial sector development (raw material, cheap labor, capital or product consumer provider) especially in the beginning of industrial sector development.

Agribusiness is an activity related to the agricultural commodities handling in a broad sense, covering one or all production chain, input and output processing (agro-industry), agricultural input and output marketing, and activity supporting institutional [8]. Agribusiness is indicated as a proper sector for a strategy in facing Indonesia economic problems, especially in Central Java. Economic development strategy through agribusiness is important because this sector can increase income far greater than only developing the agricultural sector [9]. Agribusiness is also important because it can shift unskilled human resources to skilled human resources. Skills will affect significance productivity rate [10]. Furthermore, the agribusiness development will also lead to the development of technological mastery because due to agribusiness activity such as export-import, international trade, and even increase the competition thus there will be a lot of product innovations with high selling value [11].

A new regulation is needed to establish healthy environment, economic growth, and social justice simultaneously. Central Java agribusiness development is indicated to solve the problems related to the high potential of agriculture but with only small income because of the traditional agricultural sector in Central Java thus it needs to be built by utilizing the technology and information to achieve modern
agriculture. Therefore, it required an effort in solving those problems so it will increase public welfare in Central Java through agribusiness development. The determination of agribusiness development priority areas is done by observing the condition of economic and human resources [13].

2. Data and method
The data are based on the human resource and the economic state consisting of 35 districts/cities of Central Java in 2016 [14]. The parameters to rate the human resource including dependency ratio, labours productivity, and gender empowerment measure while to rate the economic state including location quotient, food security, agricultural income, and land carrying capacity. All the data are collected from Central Java in 2017 [15].

The score of Dependency Ratio, Labour Productivity, Location Quotient (LQ), Food Security, and Land Carrying Capacity (LCC) will be obtained by calculation with the following formula:

- **Dependency Ratio**
  \[
  \text{Dependency Ratio} = \frac{\text{Children (1–14) + Elderly (>65)}}{\text{Working Age (15–65)}} \times 100
  \]

- **Labour Productivity**
  \[
  \text{Labour Productivity} = \frac{\text{GDP (Gross Domestic Product)}}{\text{Number of Employees at Work}} \times 100
  \]

- **Location Quotient (LQ)**
  \[
  LQ = \frac{\frac{\text{Economic activity in sub area i department j}}{\text{Total economic activity in sub area i}}}{\frac{\text{Economic activity of department j in the whole area}}{\text{Total economic activity in the whole area}}}
  \]

- **Food Security**
  \[
  \text{Food Security} = \text{Food availability} - \text{Food needs}
  \]

- **Land Carrying Capacity**
  \[
  \text{Land Carrying Capacity} = \frac{1}{\text{Population pressure on wetland agricultural}} \times 100
  \]

Potential areas of agribusiness development are determined by tiered weighting method. The variable of weighting only includes the parameter of economic state, because the parameter of human resource is barely different in each districts or cities. Furthermore, SWOT analysis will be used to set the alternative referrals for the potential areas of agribusiness development.

3. Result and discussion

3.1. Human Resource Analysis
Human resource is needed in agribusiness development because good condition of human resource can provide the development in agriculture and industry sector. That’s development can improve the people’s economy. Human resource condition can represent competition. Competition can be known as knowledge and characteristic of a person in form of ability and behavior that needed in carrying out of someone’s job [16]. Some parameters that used in human resource analysis are dependency ratio, sex ratio, Gender Empowerment Index (GEI), and labor’s productivity in agriculture and industry sector.
Dependency ratio (DR) is number that represents the ratio of non-productive inhabitant (age of 0-15 and 65+ years) to productive inhabitant (age of 15-65 years). In figure 2 shown that most of regency/city have DR < 50, except Kebumen and Purworejo Regency. Trend of dependency ratio in Central Java Province from 2012-2016 is lean decrease (figure 3). That’s shows that Central Java is while or already experiencing demographic bonus. So, some strategies are needed to optimize the demographic bonus, one of that is trough developing agribusiness sector.
Central Java’s population in 2016 is about 1,718,000 females and 1,690,000 males. Based on figure 4, shown that Central Java’s population is dominated by female. Large population of female induces the necessary of strategy so female marginalization can be avoided [18]. Education and skill of female should be improved so stigma that female is “weak” can be vanished. Creation of job that can absorb female labor should be improved, including through agribusiness sector. Figure 5 shows that Gender Empowerment Index (GEI) of Central Java is higher than national average. GEI is index that represents female participation in decision making through time [14]. The higher number of GEI than national average indicates that woman empowerment in Central Java is active enough and sure it would be increased if agribusiness sector is developed.

Labor’s productivity is production rate that produced by labor, where the number is ratio between income and number of labors. Refers to figure 6, known that labor’s productivity in industry sector is higher than agriculture sector. The increase of labor productivity is influenced by some factors, one of them is wage. Higher wage then higher productivity too, because it makes labor work more efficient and productive. So, increasing of labor’s productivity will raise income too [19].
Analysis of the economic resources condition is known by looking at the GDP value factor of the economic sector, especially agricultural and industrial sectors where these two things become the key in the application of agribusiness. Net income in the agricultural sector of each commodity produced also becomes an important indicator, to see net income received by farmers from what they produce. Another indicator is identifying the leading sectors in each district in Central Java and how the rate of growth of the sector when viewed on a national scale. The area of agricultural land and land carrying capacity is also an important indicator because it is the key in the development of agribusiness, especially from the agricultural sector. The identification of the adequacy of food in the district also needs to determine whether an area is sufficient food or not, where it shows how the economic condition at certain area.

Gross Regional Domestic Product (GDP) is the total value added of goods and services generated from all economic activities throughout the region within a certain year or one period year. The GDP of agricultural and industrial sectors at Central Java Province there are different values or trends as shown in figure 7. The GDP of industrial sector at Central Java has an increasing trend, while the GDP of agricultural sector has a stagnant trend. The value of industrial GDP at Central Java is much higher than the agricultural sector. Therefore, to overcome the stagnancy of GDP in agricultural sector at Central Java is by doing agribusiness program which agricultural products not only for own consumption but has led to marketing efforts.
Figure 8. Map of Income Level from Agricultural Sector in Central Java Province 2016

The value of GDP in agriculture is considered less representative to describe the net income of farmers from agricultural products. Therefore, to know the level of income in the agricultural sector as a reference in determining the priority areas of agribusiness development used by using the approach of total production and price of agriculture commodities. Agricultural sector income in Central Java province is obtained from various types of horticulture crops. Central Java's horticultural commodities consist of vegetables, fruits and ornamental plants. Grobogan Regency is the district with highest income of agricultural sector and Surakarta Regency is the district with lowest agricultural income at Central Java Province. Agricultural income in each district/city in Central Java can be different and not heterogeneous (describe by figure 8). Factors that can affect the heterogeneity of regional income from the agricultural sector are include the geographical, labor, economic, social, and local government policies. The income value of agricultural products reflects the development of the agricultural sector, where high income areas can be prioritized areas for agribusiness development program.
Analysis Location Quotient (LQ) is known by comparing about the role of a sector in a region to the magnitude of the role sector at the provincial level. This way is used to identify the internal potential of the area, which namely the base and non (un)base sector. The value of LQ (Location Quotient)> 1 means that the role of a sector in the regency more dominant than the sector at the Provincial level and as an indication that district will be surplus in productivity (that sector). Conversely, if the LQ <1 score means the role of the sector which is smaller in the regency than its role at the Provincial level. Figure 9 shows that most of the areas in Central Java are dominated by LQ> 1 or in other words the agricultural sector is the leading sector. Therefore, the potential of superiority agriculture at Central Java should be optimized through the development of agribusiness program.
Shift share analysis is a method that compares different growth rates of various sectors. The analysis knows that the value of \( P_{ij} \) in the agricultural sector shows a negative overall value (-) as shown in figure 10. So commonly, the growth of agricultural sector in district is slower than the provincial agricultural sector. It can be explained that despite the potential of potential resources in agriculture, but the level of application of technology is relatively limited so that the productivity of this sector grows slowly. Therefore, the step to contribute a high-income agricultural sector at Central Java is lead by increasing the usage of agriculture technology and marketing strategy [20].

Central Java is a province with high potential landscape in agricultural sector, which is each region has a different farmland area and very potential to be developed for agribusiness program (figure 11). Through the development of agribusiness, especially in improving the agricultural sector, it can avoid high population pressure on agricultural land through increasing agricultural productivity and the number of farm labor can be maximized to be absorbed. Land for agricultural development requires land policy to determine suitability and the amount of land can be used in the context of sustainability [21]. Land is considered an important input production to achieve agricultural development goals, so that spatial or land use planning perspective should be achieved to reach sustainable development.

![Figure 11. Map of Total Area Agriculture Land in Central Java Province 2016](image)

Land carrying capacity (LCC) at Central Java Province is low and high (figure 12). The pattern of land carrying capacity which is low and high classification indicates a disparity related to the ability of land to support the lives of people living in the local area [23]. The level carrying capacity of agricultural land is higher if the value of harvested crops per capita great. If the existing land area in a region can occupy the minimum physical needs of the population then the area has a balance of land support. Land carrying capacity is an important factor in the development of agribusiness due to the low carrying land capacity will be hinder the development of agribusiness program.

Food security means a condition in which households can occupy their food in terms of availability, security, equity and accessibility to a certain extent based on local and national orientations. This concept is linked to food security defined by the Food-United Nations Food Organization where the country is secure in food if they can occupy their food even though it is not produced by the country.
itself. Food security can be identified from food sufficiency. Almost all areas of Central Java have surplus food sufficiency value which means food in Central Java is occupy to the consumption of local people (figure 13). This condition will certainly improve welfare if developed with marketing management of agricultural products through agribusiness (levens 2010).

Figure 12. Map of Land Carrying Capacity at Central Java

Figure 13. Map of Food Security in Central Java Province 2016
3.2. *Agribusiness Development Referrals in Central Java*

There are some potentials in Central Java, such as agriculture or any other industries, which are supposed to be optimized. Agribusiness development referrals is a way on making use of those potentials. Among those referrals, there are several things to do to analyze them such as deciding the agribusiness location priority. This analysis can be done using scoring method with four parameters including LQ value, total area of agricultural land, LCC, and agricultural GDP in Central Java. Those parameters are used because they are considered as the most influential on agribusiness development due to the fact that the human resources in every district in Central Java indicates the values almost equal and has no significant differences. In order to create competitive areas, the government has to create development program which start from the development of economical potencies so that it can have a bigger role on the area’s development.

![Figure 14. Map of Agribusiness Development Conformity in Central Java.](image)

Figure 14 shows the result after analyzing which tells the district or city of Blora, Pati, Jepara, Wonogiri, Magelang, Kendal, Purworejo, Kebumen, and Brebes are the areas that are more prioritized on agribusiness development. Those areas are prioritized because of the high potential on agriculture that they have compare to the other areas in Central Java. Besides that, level of openness to trade in Central Java tends to increase which helps to do marketing activities, such as international trade in agricultural products. Central Java also have several facilities and infrastructures which support the agribusiness activities. Because of that, these priorities are expected to increase the prosperity of the people in Central Java by decreasing the rate of poverty and boosting IPM value in every area in Central Java.
### 3.3. SWOT Analysis of Agribusiness Development in Central Java

| Internal Strategic Factors Analysis Summary (IFAS) | Strength | Weakness |
|--------------------------------------------------|----------|----------|
|                                                  | 1. Supported by adequate land and human resources | 1. Agricultural area in Central Java has diminished |
|                                                  | 2. Agricultural is a superior sector | 2. The manpower in agricultural sector in Central Java has diminished |
|                                                  | 3. Industry sector is a big contributor of GDP. | 3. There is only small income of agricultural sector in Central Java. |

**Opportunity**
- 1. Free market trading
- 2. Supported by geographical location
- 3. Supported by big opportunities and market demand.

**Strategy (SO)**
- 1. Increase agricultural production
- 2. Expand marketing network
- 3. Maintain the quality of agricultural product.

**Strategy (WO)**
- 1. Increase agricultural productivity
- 2. Boost marketing strategy
- 3. Employment through agribusiness.

**Threat**
- 1. There are competitors from several other areas
- 2. Changes of consumption pattern in the society
- 3. The interest in working for agricultural sector has decreased.

**Strategy (ST)**
- 1. Increase the quality of production
- 2. Cooperating with partners from other areas
- 3. Create a program to assist the farmer to use technology
- 4. Decide marketing strategy.

**Strategy (WT)**
- 1. Commit an effective socialization on agribusiness prospect
- 2. Hold trainings to increase the quality and performance of human resources
- 3. Commit cultivation to minimalize the risk of crop failure.

SWOT analysis is a factor identification to create a company strategy. This analysis is based on the logic that maximize the strength and opportunities, and at the same time also minimalize the weakness and the threats. The company strategic decision has to consider the internal factors which include the strengths and weaknesses, also the external factors that include the opportunities and the threats. SWOT analysis in this experiment encompasses the agribusiness development potential based on economical and human resources in Central Java.

SWOT analysis on the experiment of agribusiness development based on economical and human resources in Central Java consists of four components which are the strength, weakness, opportunities, and threats. There are several strengths of agribusiness development in Central Java which include adequate land and human resources, agriculture as a superior sector, and industrial sector that contribute to the biggest GDP. Besides that, the weaknesses of agribusiness development in Central Java include the decreasing agricultural land due to function switching of the land, diminishing of the agricultural manpower, and the small income from agricultural sector in Central Java. There are also some opportunities which consist of free market trading, supports from geographical location, and bigger market demand. While the threats of agribusiness development in Central Java are the
competitors from other areas, changes of community’s consumption pattern, and the decreasing interest to work on agricultural sector.

The strategic analysis on the strength-opportunity are the way to increase the agricultural production, expand marketing network, and maintain the quality of agricultural products. Strategic analysis on the weakness-opportunity includes the way to increase the productivity of agriculture and the marketing strategy and doing employment through agricultural sector. Besides that, the strategic analysis on the strength-threat are by boosting the quality of production, collaborating with partners from other areas, and create farmer assisting program towards the technology, also deciding on a market strategy. Lastly, strategic analysis on the weakness-threat include doing an effective socialization program for agribusiness prospects and training to increase the quality of human resources, and also commit cultivation to minimalize the risk of crop failure.

4. Conclusion
The condition of human resources in Central Java is the female population is bigger than male population, the dependency ratio is less than 50, and the labor productivity in the industrial sector is bigger than the agricultural sector. The condition of economic resources in Central Java such as the GDP of the industrial sector is greater than the agricultural sector, the superior sector is reflected by the value of \( \text{LO}> 1 \), where the agricultural sector is the leading sector in Central Java, the growth of the agricultural sector is reflected through the \( P_{ij} \) sector with negative value and the sufficiency of food in Central Java is sufficient (positive value). Development Referrals based on the human and economic conditions in Central Java through the agribusiness sector are expected to improve the welfare of the population through poverty reduction and the increase of HDI. The results of the analysis also found that agribusiness development was done with priority of agribusiness development in Blora, Pati, Jepara, Wonogiri, Magelang, Kendal, Purworejo, Kebumen, and Brebes.

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