Integrated Sectoral Planning Through The Region Industrial Agglomeration Mapping That Promote Agricultural Sector In Semarang Regency

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ABSTRACT

Objective – The objective of this study is industry mapping through the production factor identification that used. The mapping results will be used as a justification for preparing to the sectors planning in Semarang Regency.

Methodology – This research was implemented in a West Ungaran district become the highest number industry with 236 industries. Mostly, the industrial sector that located in Semarang Regency was engaged in the food sector. Chemical and building materials industry is the second largest after food industry. The regional planning in this region considered to the agricultural sector. The development planning of timber production, flour base commodity, soybeans and nuts industrial cluster should be synchronized with agricultural development strategy.

Findings – The region having the largest industrial number is West Ungaran District with 236 industries. The total majority of the industry located in Semarang Regency is the industry engaged in the food sector

Novelty – Finally, this research is expected to provide the strengthening effect for the agricultural sector, which will increase the contribution to the regional economy.

Type of Paper:

Keywords: industry, planning, economic sector, agriculture, Semarang, agglomeration

1. Introduction

The natural or artificial differences among the regions within a territory may lead to differences in opportunities to grow and develop. The regional economic improvement can be carried out by utilizing and developing the potential of every region. One potential region that can be utilized as a means of improving the regional economy is the presence of industrial agglomeration. One region in Indonesia as one of the industrial agglomerations is Semarang Regency.

Semarang Regency is located in Central Java Province. Semarang Regency is famous for its industrial agglomeration region. The strategic location with a variety of access these are the sea, land and air makes a lot of investors set up industries in this regency. Currently the number of industries in Semarang Regency is 1521 consisting of 1341 small industries and 180 medium and large industries. But unfortunately the existence of industrial agglomeration in Semarang Regency has not been utilized by the local government as a means to increase the regional economy.

The analysis result of Input Output of Semarang Regency (Fafurida, 2010) found that Semarang Regency is a place of industrial agglomeration, but in fact the industrial sector is not the dominant one. It is because the industrial sector has no high backward linkage with the input provider sectors and also has no high forward linkage with the output user sectors. This reflects that there are many industries in Semarang Regency, but the raw materials used by these industries do not come from Semarang Regency but from other regions. Similarly, most users of the industrial result are not the sectors existing in Semarang Regency, whereas, if it is observed, the linkage between the industrial sectors with other sectors is quite a lot. For example, the linkage with the agricultural sector, there are many industries that use raw materials (input) from the agricultural sector, such as the industries of food, garment, furniture, and so on. Industries are also very closely related to the transport and services sectors. Industries have also the linkage with transportation and service sectors. To carry out the distribution of goods, industries definitely need transportation or delivery services for export, and there are still a lot of linkage between industries and other sectors. It is very unfortunate if the local government cannot examine these opportunities because it illustrates that many industries in a region will not have any influence on the increase of the regional economy.

The arrangement of regional planning should be based on the potential of every region. The planning arrangement should be based on an analysis and a solid foundation to reach a successful development and increase the regional economy. The utilization of local potential as one tool for increasing the economy has not been carried out by the government of Semarang Regency, and this must be corrected immediately.

The strong potential owned by Semarang Regency, which is the industrial agglomeration region, should be utilized as one means for increasing the regional economy. Although the industrial sector is a sector having major contribution to the regional revenue, unfortunately the existence of industries accounted for 1521 has not been utilized as a means of increasing the income in other sectors.

From the five types of industries that exist in Semarang Regency, the most numerous type of industry is the food industry. The second is the chemical and building material industry, followed by the clothing industry, the metal and electronics industry and the last is the handicraft industry. From this diversity of industry types, there are certainly great opportunities for the development of other sectors through such a number of industries. One example is the agricultural sector, with the type of industry that mostly is the food industry, which raw materials are derived from the agricultural sector. These opportunities can be utilized by the farmers in the region to produce the agricultural products that are the raw materials of the food industry considering that most of the existing land in Semarang Regency is used for the agricultural sector.

2. Literature Review

Empirical study of the agglomeration performed by Didi Nuryadin et al (2003) analyzing the impact of agglomeration on regional economic growth on 26 provinces in Indonesia with the dependent variable of growth rate of GDP per province throughout Indonesia at constant prices and the independent variable is the agglomeration, the rate of labor force, the rate of inflation, the rate of economic openness (the rate of openness), and human capital. By using regression analysis with Generalized Least Squares (GLSD) method or least squares method that produces a linear and unbiased assessment (Gujarati, 1995: 52), it can be concluded that the agglomeration variables have the highest coefficient value compared with other independent variables, these re the rate of labor force, the rate of inflation, the rate of openness, and the

level of education. This shows that if the agglomeration (industrial grouping) is more developed, it can provide a substantial contribution to support the increasing rate of regional economic growth.[11]

The research of Glenn Ellison, Edward L. Glaeser and William Kerr entitled "What Causes Industry Agglomeration? Evidence from the Co - agglomeration Patterns." (2007), which examined the manufacturing industry in the United States and the United Kingdom, concluded that the agglomeration or industrial grouping is required because it can save the cost of transportation of the raw material sources and the cost of the industrial products to the final consumers.

Another research result of agglomeration is conducted by Todd M. Gabe, which entitled "Effects of industry agglomeration on Indicators of Growth and Development in Maine". Todd M. Gabe studied the relationship between industrial agglomeration with the location of the company, the growth of employment and incomes. The research result concluded that there is a positive relationship between the industrial agglomeration with the location of the company, the growth of employment and incomes. This can be shown by seeing that the existence of agglomeration encouraged the growth of the company's location at 31.5 percent, the growth of employment at 29.3 percent and the increase of incomes at 15.5 percent.

Juoro (1989) analyzed the determinants of concentration in Indonesia (and he also analyzed the concentration of industry in the Philippines). By using the function similar to CES developed by Dhrymes (1965), he did a regression of wages as a function of output and employment. From the estimated parameters of the degree of homogeneity, which represents the economic scale or an economy of localization for the industrial level, the result showed that almost all industries of three digits in Indonesia have a greater degree of homogeneity than one. This situation is a sign that the economy of localization is important to make the industries concentrated in the large urban areas.

Hanson (1998) who examined the impact of trade liberalization was focused on the transport costs, in which the company moves into a relatively good area to access foreign markets. The backward-forward linkages encourage the company to be located close to the buyers and distributors (suppliers), and the economic agglomeration encourages the growth before the industrial center exists. The fact here particularly considers the growth of the regional industry workers in Mexico before and after the trade reforms. It is consistent with the hypothesis from the transportation cost that the growth of workers after the trade reform is higher in the region that is relatively closed in the United States. It is consistent with the backward-forward a linkage hypothesis that the growth of workers is higher in the region that is located close to the upstream and downstream industries. There is no evidence that the economic agglomeration has a positive correlation with the growth of workers. The result illustrates that the decomposition of the manufacturing belt in Mexico City and the wider specialization of industrial center is located in North Mexico.

Theory Underlying the Research

The Development of Regional Economic Potential

A potential region is a region that is less developed or not developed at all but has factors that may lead it to develop quickly if there is a development (Sukirno, 1985: 78). The development and economic development of a region in principle are based on the utilization and the processing of natural wealth potential and other resources available in the region. The economic potential of a region is the natural wealth sources and their results and also the human resources and others available in the region (Kamaludin, 1989: 90). Potential of regions in various sectors both the ready processing and the potential ones are quite widely available and reliable for the economic development and improvement in the region.

Program of linkages between the sub-sectors and sectors in the pattern of the national economic development is a good and suitable policy to be implemented and continued in the economic development in a region. However, the implementation needs to be adapted to the conditions and the real potential of the region. The regional development should pay more attention to the

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advantages and characteristics of every region. Various results of the development and growth of the economic sector in a region may lead it to have various advantages, which can be absorbed in the process of implementation (Kamaludin, 1989: 84). These advantages include:

1. The production result of the economic sector in the form of revenues is getting higher.
It will give more contribution both for the people and the formation of GDP in the regional management through the emphasis on economic development in various sectors.
2. The rate of economic sector growth and development is getting higher.
A high level of economic development will be achieved through optimal resource utilization.

Agglomeration Concept

In the context of geographic economy, the concept of agglomeration is related to the spatial concentration of population and economic activities (Malmberg and Maskell, 2001). This is in line with what was stated by Montgomery in Kuncoro (2002) that the agglomeration is the spatial concentration of economic activities in urban areas because of the savings due to the adjacent sites (economies of proximity) that is associated with spatial clusters of companies, workers and consumers. The advantages of spatial concentration as a result of scale economies are called the agglomeration economies. (Mills and Hamilton, 1989).

The definition of agglomeration economies is also related to the geographical proximity externalities of economic activities that an agglomeration economy is a form of positive externalities in production, which is one factor that leads to the growth of the city. (Bradley and Gans, 1996). Agglomeration economy is defined as a decrease in production costs because the economic activities are located in the same place. This idea is donated by Alfred Marshall that uses the term localized industry as a replacement of the term agglomeration economies.

Economist Hoover also makes the classification of agglomeration economy into three types, those are large scale economies, which are the corporate profits due to the growing scale of the production company at a certain location, localization economies, which are the benefits for all companies in the same industry in a certain location, and urbanization economies, which are the profits for all industries in the same location as a consequence of the growing scale of economies (population, income, output or prosperity) of the location. In contrast to the opinion of other economists, O'Sullivan (1996) divides the agglomeration economy into two types those are localization economies and urbanization economies. In this case the meaning of agglomeration economy is the positive externalities in production, which is the decreasing cost of production of most companies as the result of the increasing production of other companies.

3. Research Method

The data used in this research is mostly the secondary data. The secondary data is obtained from the Department of Industry, Trade and Cooperatives, the Central Bureau of Statistics and every district in Semarang Regency. The data collecting in this research applies the documentation method, in which the data is obtained and collected from various sources among others are from the Department of Industry, Trade and Cooperatives and the Central Bureau of Statistics and every district in Semarang Regency. The data analysis technique used in this research is the statistic descriptive. The survey result conducted will be tabulated and analyzed and then presented in the forms of tables, graphs and figures to be analyzed qualitatively.

4. Results and Discussion

Identification and Industrial Mapping

Semarang Regency has the considerable industrial number exceeding other regencies. There are 1649 industries of various types of existing industries consisting of small, medium, and large industries. As for the distribution of industrial locations in Semarang Regency can be seen in the figure 2. The industrial distribution number in every district in Semarang above, it

can be seen that the region having the largest industrial number is West Ungaran District with 236 industries, while the regions having the second and the third largest industrial number are Bergas District and Ambarawa with 193 and 173 units respectively.

From the total number of 1649 existing industries after being identified, it shows that the number is the total of the five types of the existing industries those are the industries engaged in food, clothing, chemicals and building materials, metals and electronics and also the industries engaged in handicraft, industrial food, clothing, chemicals and building materials, metals and electronics and handicraft industry in 561, 292, 538.145 and 113 units respectively. From this analysis, it appears that a majority of the number of industries in Semarang Regency is industries engaged in the food sector. The food industry is very closely related to the agricultural sector. The input from this type of industry is mainly the agricultural products. Therefore, it is appropriate if Semarang Regency develops its agricultural sector based on the food industry. Here is presented the distribution industry based on types in every district in Semarang Regency.

Table 1. The amount of the industrial distribution based on types in every district in Semarang Regency

No	District	Food	Clothing	Building Materials and Chemistry	Electronics and Metals	Handicraft	Total
1	West Ungaran	74	58	63	27	14	236
2	East Ungaran		24	44	9	8	151
3	Bergas	34					193
4	Pringapus	24			11	10	171
5	Bawen	25	15	40	12	8	100
6	Ambarawa		24	48		10	173
7	Sumowono	14	0	6	2	1	23
8	Jambu	41	6	24	11		93
9	Tuntang		15	36	8	5	141
10	Banyubiru	29	7	13	7	8	64
11	Getasan	10	2	5	0	3	20
12	Tengaran	30	7	37	3	9	86
13	Susukan	30	4	10	0	5	49
14	Suruh	11	5	21	2	2	41
15	Pabelan	11	8	18	0	3	40
16	Bringin	9	5	16	0	1	31
17	Bancak	0	0	3	1	0	4
18	Kaliwungu	6	0	2	1	1	10
19	Bandungan	4	14	2	2	1	23
	Total input	**561**	**292**	**538**	**145**	**113**	**1649**

Source: Department of Industry, Trade and Cooperatives, Semarang Regency, the data processed

From the table 1 it can be seen that from the type of food industry, the most dominant regions as the location of this type of industry are Tuntang, West Ungaran, East Ungaran, and Ambarawa with 77,74,66 and 66 units respectively. From the type of clothing industry, the regions having the largest industries are West Ungaran, Pringapus and Bergas with 58, 50 and 48 units respectively. Chemical and building material industry is the second largest one after the food industry with 538 spread over almost the entire area of Semarang Regency. The dominant regions that become the start building of the chemical and building material industry are Pringapus, Bergas and West Ungaran with 76, 74 and 63 units. The next type of industry is the metal and electronics industry with 145 units spread over the area of Semarang Regency. The regions having the great metal and electronics industries are West Ungaran, Ambarawa and Bergas with 27, 25 and 24 units respectively. The last type of industry is the handicraft industry with a total number of 113 industries. West Ungaran, Bergas and Jambu are the districts having the large handicraft industry compared with other districts, with 14, 13 and 11 units.

By observing the types of industrial distribution in every district that is presented in the figure below, it will be obvious which regions that have the dominant food, clothing, chemicals and building materials, metals and electronics and craft industries. From the figure, it can be concluded that the dominant food industry is located in Tuntang, the dominant clothing industry is located in West Ungaran, the dominant chemical and building material industry is located in Pringapus, the dominant metal and electronic industry is located in West Ungaran, and the dominant handicraft industry is located in West Ungaran.

Food Industry

The food industry is a type of industry that is dominated in Semarang Regency. Observed from the spreading, these types of industry are dominantly found in Tuntang District with 77 industries with the industrial majority of crackers, West Ungaran with 74 industries with the industrial majority of bread, crackers and soft drinks, East Ungaran with 66 industries with the industrial majority of the food industry from soybean and nuts, Ambarawa with 66 industries with the industrial majority of livestock feed rations, the food from soybeans and nuts and crackers.

Clothing Industry

The Clothing industry is an industry that is engaged in the convection where the output of this industry is the clothing worn by the people. These types of clothing industry are also commonly found in Semarang Regency. The number of this type of industry is quite a lot that is 292 units. The regions dominated with clothing industry are West Ungaran, Pringapus and Bergas. The majority of this type of industry in every district is as follows: West Ungaran is a location dominant with the apparel industry, Pringapus is a location dominant with the textile industry of finished goods, except for clothing and apparel industry, Bergas is a location dominant with the apparel and garment industry.

Chemical and Building Material Industry

Chemical and building material industry is the second largest type of industry after the food industry with 538 units. This type of industry is dominantly located in three districts those are Pringapus with the industrial majority of the wood panel, moulding and component of building materials and the furniture industry. Bergas is dominant with the furniture industry and West Ungaran is a location dominant with the printing and furniture industry.

Metal and Electronic Industry

The fourth type of industry in Semarang Regency is the metal and electronics industry. This type of industry has 145 units spread over the areas in Semarang Regency. The dominant regions having this type of industry are West Ungaran with the industrial majority of car maintenance and repair, Ambarawa with the industrial majority of various special services for the metal and metal goods, Bergas with the industrial majority of various kinds of jobs.

Handicraft Industry

There are 113 business units in Semarang Regency that are engaged in the handicraft industry. This industry is spread throughout the whole regions in Semarang Regency. There are several regions that are the location dominant with this type of industry. They include West Ungaran with the industrial majority of carving crafts, precious jewelry and other processing, Bergas with the industrial majority of handicrafts, Jambu with the industrial majority of handicrafts.

Regional Planning

The sector planning of every region is based on the result of the identification and mapping of the existing industries in Semarang Regency. It is based on the theory stating that every sector has the good forward and backward linkages. In this case, the backward linkage from the industrial sector to the input provider sector that is the agricultural sector is very much available. This can be exemplified from the majority of the food industry in Semarang Regency

as the industries of bread, soy bean cake, chips, etc., which notably have the raw materials for the agricultural sector. There is also the building materials industry and handicrafts linkage using an input of wood from the agricultural sector product. Under these conditions, this research can formulate a plan of agricultural sector development based on the industrial mapping. The planning is arranged based on the result of the industrial mapping and the location and condition of the region.

From the consideration of the location it can identify the layout of every district as a basis for determining the planning of industrial centre and industrial input providers regions. The planning is arranged based on the majority of the industrial types and based on the location that is possible to be the input providers on the existing industries. The following table of planning is based on the above conditions.

The planning arranged in Semarang Regency above is based on the existing industrial potential. The table shows that the majority of development recommendation based on agriculture is the determination of timber production centre, flour commodity, soybeans and nuts. This is because the majority of the industry located in Semarang Regency uses timber, flour, soybeans and nuts. Considering that these industries are dominant with weight loosing activity, then the input of production must be closer to the industry. So it is appropriate if the development of industry-based agricultural commodities is carried out. The next expectation if the planning is carried out, the existence of industries that are located in Semarang Regency can encourage the increase of the agricultural sector as the input provider so as to increase the value of backward linkage between the industrial and agricultural sectors.

Table 2. Regional Planning of Semarang Regency

No	District	Planning Direction
1	West Ungaran	• Bread industrial centre and its kind • Cracker industrial centre and its kind • Soft drink industrial centre • Apparel industrial centre • Printing industrial centre • Wooden furniture industrial centre • Flour commodity production centre • Timber production centre
2	East Ungaran	• Food industrial centre from soybeans and nuts • Soybean and nut production centre
3	Bergas	• Apparel industrial centre • Garment industrial centre • Furniture industrial centre • Timber production centre
4	Pringapus	• Industrial centre of goods to be textiles • Apparel industrial centre • Wooden furniture industrial centre • Industrial centre of moulding and building material components • Other timber panel centre • Timber production centre
5	Bawen	• Timber production centre • Flour commodity production centre
6	Ambarawa	• Cracker industrial centre and its kind • Snack industrial centre • Flour commodity production centre
7	Sumowono	• Timber production centre • Flour commodity production centre • Soybean production centre

		• Nut production centre
8	Jambu	• Flour commodity production centre
9	Tuntang	• Timber production centre
10	Banyubiru	• Flour commodity production centre
16	Bringin	• Timber production centre
17	Bancak	• Timber production centre
19	Bandungan	• Timber production centre • Flour commodity production centre

5. Conclusion

The region having the largest industrial number is West Ungaran District with 236 industries. The total majority of the industry located in Semarang Regency is the industry engaged in the food sector.

The most dominant regions as the location of the food industry are Tuntang, West Ungaran, East Ungaran and Ambarawa. From the type of clothing industry, the regions having the largest industry are West Ungaran, Pringapus and Bergas. Chemical and the building material industry are the second largest after the type of food industry. The dominant regions as the start building of the chemical and building material industry are Pringapus, Bergas and West Ungaran. The type of metal and electronics industry is dominantly located in West Ungaran, Ambarawa and Bergas. And the handicraft industry is dominant in West Ungaran, Bergas and Jambu.

The majority of the direction of regional development based on the agricultural sector is the determination of the centers for timber production, flour commodity, soybeans and nuts. The majority of the industry located in Semarang Regency uses timber, flour, soybeans and nuts. Considering that these industries are dominant with weight loosing activity then the input of production must be closes to the industry. So it is appropriate if the development of industry-based agricultural commodities is carried out.

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