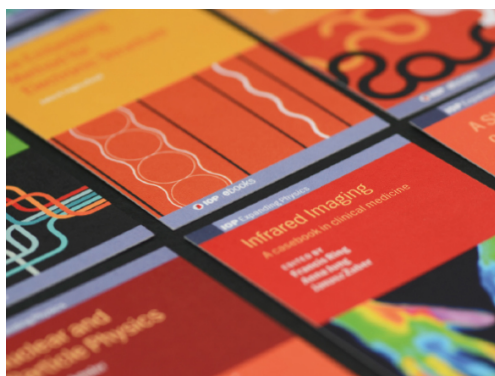


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# Development of industrial estates in the context of supporting border economic development (Case study at Entikong National Strategic Areas)

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**Abstract.** The Entikong National Strategic Area Center is one of the areas that is directed to be the center of strategic activities, but infrastructure and production factors have not made it possible to produce competitive and profitable products and commodities in the market. Transport costs are very expensive because distance and road conditions that limit market reach for the economy. In this situation, there is no other choice unless the community is directed and assisted to be able to produce products (semi-finished or finished) that the high value exceeds the cost of production and transportation costs. This research aimed to draw up the design of the Border Industrial Zone with two regional leading commodities, consists of pepper and rice. This area was built to accommodate industrial activities that utilize the potential of resources in the border region in an effort to increase the added value, quality and quantity of natural resources. This study used a qualitative and quantitative descriptive approach with an analytical method consisting of business feasibility analysis, supply chain analysis, and scalogram analysis. The study was located in the Central Entikong National Strategic Area and the surrounding area, Sanggau Regency, West Kalimantan Province. The results showed that the development of the pepper and milling processing industry was feasible if the raw materials used were not only sourced from the Entikong sub-district but had to involve other sub-districts located in Sanggau District. This Special Border Industry Zone is centered on Entikong Village, Entikong Subdistrict as a location adjacent to neighboring countries and adjacent to the Entikong State Cross Border Post. In the development of industrial estates need a cooperation among sub-industries in the region to achieve economies of scale and sustainable.

## 1. Introduction

The border area according to Law Number 43 / 2008 concerning State Territory is part of the territory of a country which lies on the inner side along the borders of other countries based on the dividing line of sovereignty of a country in international law. The border area is an area far from the center of government and often lacks attention in development. The government has made state cross border post throughout the border areas in Indonesia, especially in Entikong District, Sanggau Regency, Kalimantan West province. The existence of these facilities has been a dynamic increase in economic activity indicated by an increase good flow of people and goods. The theoretical review exemplifies the opportunity to increase economic growth from these economic opportunities, but until now Entikong



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has not shown any development in the context of developing a border region between countries from an economic perspective that supports Entikong's function as a growth center [1]. The main factors of development are industrial agglomeration with economic development and cooperation at the border [2]. Entikong Sub district is an area with an agricultural area of 80 %, so the development of industrial estates on the border area should be agriculture based.

The development of agriculture-based industrial areas is better known as the agro-industrial area. Agricultural products and other resources have been traded to medium and large-scale industries in urban areas. This means that the added value carried out in urban areas that increase economic activity and urban welfare. In the other side, the border community buys products that have a double value compared to the primary products of their produces. The difference in value should be used to increase economic activity where the resource is located (rural). Therefore, a study of industrial estate development is needed to increase the value added of superior commodities in the border region.

## **2. Theoretical based**

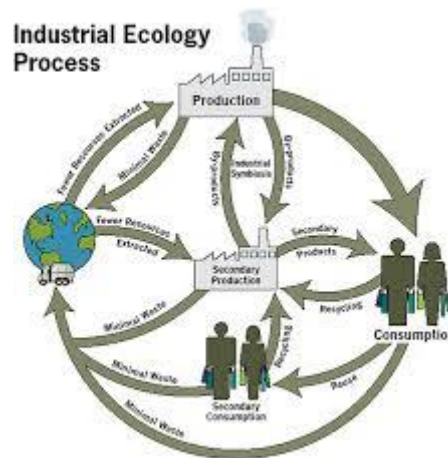
### *2.1. Industrial zone*

According to the Government Regulation of the Republic Indonesia Number 142/2015 concerning Industrial Estates. Industry is all forms of economic activities that process raw materials and / or utilize industrial resources so as to produce goods that have higher added value or benefits, including industrial services. Whereas Industrial estates are areas where concentration of industrial activities are equipped with supporting facilities and infrastructure developed and managed by Industrial Estate Companies. Industrial Estate Company is a company that seeks the development and management of Industrial Estates. Industrial estates are built with the aim of accelerating the spread and even distribution of industrial development; increase efforts for industrial development that are environmentally sound; improve investment competitiveness and industrial competitiveness; and provide certainty of location according to spatial planning

### *2.2. Pattern of establishment of industrial estates*

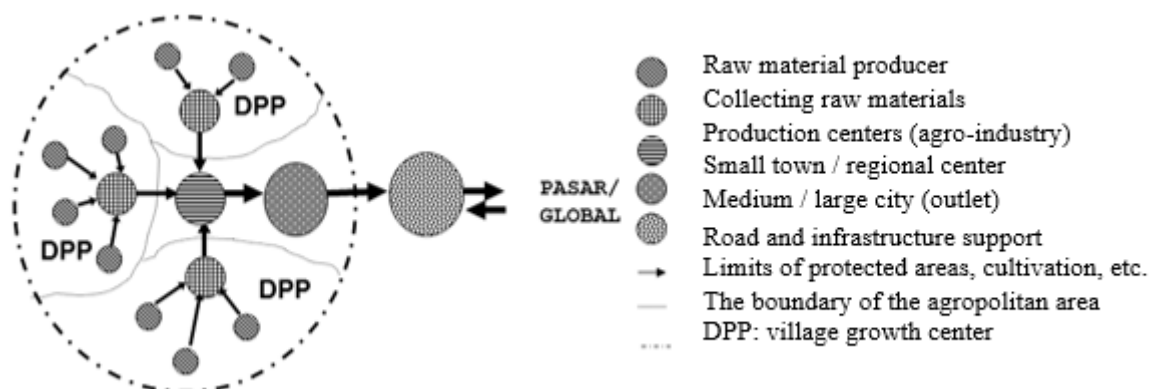
Construction of Industrial Estates is carried out by business entities in the form of legal entities and established under Indonesian law and domiciled in Indonesia. The intended business entity can be in the form of 1) State-Owned Enterprises or Regional-Owned Business Entities; 2) Cooperatives; or 3) Limited Liability Company. Industrial estates are built with a land area of at least 50 (fifty) hectares in one stretch. Whereas for industrial estates designated for Small and Medium Industries can be built with a land area of at least 5 (five) hectares in one stretch (Republic of Indonesia Government Regulation Number 142 of 2015 concerning Industrial Estates) [3]. The concepts applied for industrial estate development are as follows:

*2.2.1. Sustainable industrial estate.* The basic concept of ecology where manufacturing uses pure material taken from nature. Extracted into certain products which are then used by other industries or can also be directly consumed by consumers. Waste products produced from this production process or the remaining consumer consumption are then reprocessed so that later they can also be used again for pure material growth. All stages that are passed are formed in a system called a closed system, where all remaining production is restored.



**Figure 1.** Basic concepts of industrial ecology [4].

2.2.2. *Agricultural and agribusiness industrial zone.* Regional development centers play a role in increasing added value, increasing employment, which in turn will expand the service / service sector, improve facilities and infrastructure, then provide benefits to all parties involved. Agro-industry is the center of agropolitan area development.



**Figure 2.** The concept of agropolitan development [5].

### 3. Method

### 3.1. Research design draft

This research used a descriptive research that explains the above phenomena that exist and describe clearly. Descriptive research carries out analysis until the description stage, which is analyzing and reviewing facts systematically that they are easier to understand and conclude.

### 3.2. The location of the research

This research was conducted at Entikong Sub district of Sanggau Regency, with research object on identification feasibility study of leading commodities and industrial development plans.

### 3.3. Data collection method

In this study using primary data and secondary data. The primary data collection method in this study was carried out by direct observation (field observations), interviews and questionnaires. Secondary data was collected from documents of instance that support research.

### 3.4. Analysis method

This analysis is used to solve problems that are qualitative and quantitative. The analytical methods used are:

- Feasibility Study is the analysis for gives recommendation to investors that describes the condition of the feasibility of a business. The purpose of this feasibility study is to determine the way out so that it can minimize the obstacles and risks of business development in the future.
- Supply Chain: Supply chain analysis is a network of independent and interconnected organizations that cooperate cooperatively and mutually benefit in controlling, regulating and improving the flow of material and information from producers to consumers [6].
- Skalogram Analysis: Scalogram analysis is the analysis used to determine the location of the growth center as seen from the availability of the main facilities for regional growth. the region with the main hierarchy is the area that will be used to an industrial center.

## 4. Results and discussion

The area of Entikong Sub district is around 506.89 square kilometres, 80.01 percent of the total land in Entikong Sub district was used for agricultural land and 19.99 percent for non-agricultural land. In general, the topographical condition of Entikong Sub district is hilly and only 40 percent is flat, with this condition some people in cultivating agricultural land by shifting fields. With the geographical condition of the Entikong Sub district, the regional leading products are in the form of agricultural and plantation commodities. The leading commodities of the area are rice and pepper. So, the industry to be developed must be agriculture based.

### 4.1. Feasibility analysis of pepper industry

The analysis of financial aspects carried out in this study is important to find out the feasibility of establishing a pepper processing business. There are two important cost components in establishing this business, investment costs and operating costs.

*4.1.1. Investment costs.* Investment needs in the business plan for the establishment of this pepper processing plant consist of the establishment of factory buildings, purchasing equipment and procurement of equipment as initial capital to support the running of business activities. Details of the investment plan can be seen in the following table:

**Table 1.** Pepper industry investment costs.

| No.                    | Investment costs                                       | Unit of Goods | Unit           | Price (Rp)    | Total (Rp)    |
|------------------------|--------------------------------------------------------|---------------|----------------|---------------|---------------|
| 1.                     | Land Preparation                                       | 2             | Ha             | 1.000.000.000 | 2.000.000.000 |
| 2.                     | Material Preparation and Construction of Mobile Fences | 500           | m <sup>2</sup> | 20.000.000    | 1.000.000.000 |
| 3.                     | Construction of Infrastructure                         | 1             | unit           | 1.700.000.000 | 1.700.000.000 |
| TOTAL INVESTMENT COSTS |                                                        |               |                |               | 4.700.000.000 |

*4.1.2. Operating costs.* The costs required to run a processing business and rice mill consist of fixed costs and variable costs. The assumptions used in making pepper processing plants can be seen in the table below:

**Table 2.** Pepper industry operating costs.

| Cost Description                                                | Unit of Goods | Unit   | Price (Rp)    | Total Price (Rp)      |
|-----------------------------------------------------------------|---------------|--------|---------------|-----------------------|
| <b>VARIABLE COST</b>                                            |               |        |               |                       |
| Pepper productin                                                | 1443          | Ton    | 120.000       | 17.316.000.000        |
| Pepper Drying and Processing                                    | 1             | Year   | 2.000.000.000 | 500.000.000           |
| Water Cost                                                      | 12            | Month  | 44.300.000    | 44.300.000            |
| Labor costs                                                     | 10            | Person | 2.146.000     | 21.460.000            |
| <b>TOTAL VARIABLE COSTS</b>                                     |               |        |               | <b>17.881.760.000</b> |
| <b>FIXED COSTS</b>                                              |               |        |               |                       |
| Management and Maintenance Costs (electricity, water, officers) | 1             | Year   | 684.000.000   | 684.000.000           |
| Depreciation of buildings and fences: 5%                        | 1             | Year   | 50.000.000    | 50.000.000            |
| Road shrinkage, water source, truck etc.: 5%                    | 12            | Month  | 85.000.000    | 85.000.000            |
| <b>TOTAL FIXED COSTS</b>                                        |               |        |               | <b>819.000.000</b>    |

An analysis of the business feasibility criteria is used to determine whether the establishment of a pepper processing plant is feasible for the duration of the project. Calculation of investment criteria uses the Cash Flow method, where all revenues for the next ten years are discounted at present. The loan interest rate used is 11.2% (2018). The results of the business feasibility analysis are as follows.

**Table 3.** Analysis of pepper industry.

| Investment Criteria | Value           |
|---------------------|-----------------|
| NPV (Rp)            | 260.754.025.538 |
| Net B/C             | 34              |
| IRR                 | 26%             |
| PBP                 | 2 Years         |

The NPV of a project is the difference in PV of the revenue stream with the PV current of costs. Based on the results of calculations, NPV of Rp. 260,754,025,538.00 was obtained. This value indicates that industrial factory inflows over a period of 30 years at an interest rate of 11.2 percent were greater than the cash outflows, so the establishment of the business carried out was profitable and feasible. in the long run because the NPV produced is greater than zero ( $NPV > 0$ ).

Net B / C Ratio is an additional net benefit or net value currently received by a business during the life of the business at a certain interest rate. The PI value or Net B / C in pepper processing business is 34 Because the PI value is  $> 1$ , then the establishment of this business is profitable and feasible to implement.

The IRR is the level of net profit from a maximum business that the project can pay for the resources used. The IRR value obtained in the pepper processing plant business is  $26\% > DF = 11.2\%$ , meaning that the project carried out by the company has a project rate of return on investment. This shows that the return on capital used is greater than the discount rate used.

Payback period (PP) or investment return period is a calculation of the length of time required by a project to be able to return the initial investment costs. The results of the analysis of the payback period based on the present value with a discount rate of 11.2 percent, show that to recover the value of the investment that has been made it takes more than 2 years. The value is lower than the life of the project,

which means that after this period, the company can return the capital spent on the pepper processing business so that it is feasible to run.

#### 4.2. *Pepper supply chain industry*

For pepper products, there are several activities that must be done related to Supply Chain based on the data below:

**Table 4.** Pepper industry supply chain.

| Part                                 | Coverage of activities                                                                                                                                                                               |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pepper product development           | Conducting market research, designing development and innovation of pepper (from processing to packaging), involving pepper farmers in designing pepper innovations.                                 |
| Procurement of pepper products       | Choosing the best pepper yield, evaluating the production of farmers, purchasing raw materials and components, monitoring the results and marketing of pepper, helping farmers in producing results. |
| Pepper Production Planning & Control | Demand planning, demand forecasting, capacity planning, production planning and inventory.                                                                                                           |
| Production operation                 | Production execution, quality control.                                                                                                                                                               |
| Shipping / Distribution              | Distribution network planning, shipping scheduling, looking for and maintaining relationships with shipping service companies, monitoring service levels at each distribution center.                |

#### 4.3. *Feasibility analysis of rice agro-industry*

The important cost of feasibility analysis of rice agro-industry consists of:

4.3.1. *Investment costs.* Details of the investment cost plan can be seen in the following table:

**Table 5.** Rice industry investment costs.

| No.                    | Investment costs                       | Unit of Goods | Unit           | Price (Rp)    | Total (Rp)     |
|------------------------|----------------------------------------|---------------|----------------|---------------|----------------|
| 1.                     | Land preparation                       | 5             | Ha             | 1.000.000.000 | 5.000.000.000  |
| 2.                     | Construction of a factory building     | 700           | m <sup>2</sup> | 3.000.000     | 2.100.000.000  |
| 3.                     | Installation of fences                 | 400           | m              | 2.000.000     | 800.000.000    |
| 4.                     | Road Construction in the factory area  | 100           | m <sup>2</sup> | 8.000.000     | 800.000.000    |
| 5.                     | Procurement of drying machines         | 1             | Unit           | 550.000.000   | 1.000.000.000  |
| 6.                     | Procurement of milling machines        | 1             | Unit           | 1.000.000.000 | 2.000.000.000  |
| 7.                     | Procurement of trucks                  | 4             | Unit           | 175.000.000   | 1.200.000.000  |
| 8.                     | Car Procurement                        | 1             | Unit           | 200.000.000   | 200.000.000    |
| 9.                     | Making drill wells                     | 1             | Unit           | 100.000.000   | 500.000.000    |
| 10.                    | Procurement of reservoirs and piping   | 1             | Unit           | 100.000.000   | 300.000.000    |
| 11.                    | Construction of Electric Power Centers | 1             | Unit           | 200.000.000   | 400.000.000    |
| 12.                    | Office Furniture                       | 1             | Package        | 300.000.000   | 300.000.000    |
| TOTAL INVESTMENT COSTS |                                        |               |                |               | 14.600.000.000 |

4.3.2. *Operating costs.* Details of the operational cost can be seen in the following table:

**Table 6.** Operational costs of rice agro-industry.

| Cost Description                         | Unit of Goods | Unit  | Price (Rp)    | Total (Rp)             |
|------------------------------------------|---------------|-------|---------------|------------------------|
| <b>VARIABLE COST</b>                     |               |       |               |                        |
| Rice production                          | 29611,19      | Ton   | 6.000.000     | 177.667.140.000        |
| Packaging purchases                      | 1             | Year  | 2.000.000.000 | 2.000.000.000          |
| Communication Costs                      | 12            | Year  | 25.000.000    | 300.000.000            |
| Office Supplies                          | 1             | Year  | 100.000.000   | 100.000.000            |
| Electricity costs                        | 12            | Year  | 125.000.000   | 1.500.000.000          |
| Promotion costs                          | 12            | Year  | 75.000.000    | 900.000.000            |
| Transportation costs                     | 12            | Year  | 200.000.000   | 2.400.000.000          |
| Labor costs                              | 12            | Year  | 140.000.000   | 1.680.000.000          |
| <b>TOTAL VARIABLE COST</b>               |               |       |               | <b>186.547.140.000</b> |
| <b>FIXED COST</b>                        |               |       |               |                        |
| Property tax                             | 1             | Year  | 10.000.000    | 10.000.000             |
| Car tax                                  | 1             | Year  | 20.000.000    | 20.000.000             |
| Car Maintenance Costs                    | 12            | Month | 25.000.000    | 300.000.000            |
| Machine Maintenance Costs                | 1             | Year  | 500.000.000   | 500.000.000            |
| Depreciation of buildings and fences: 8% | 1             | Year  | 232.000.000   | 232.000.000            |
| Road shrinkage, water source, truck: 8%  | 1             | Year  | 200.000.000   | 200.000.000            |
| <b>TOTAL FIXED COST</b>                  |               |       |               | <b>1.262.000.000</b>   |

Feasibility analysis of the rice milling industry using interest rates of 11.2 percent. Analysis of the eligibility criteria used in this study are NPV, Net B / C, IRR and Payback Period.

**Table 7.** Feasibility analysis of rice industry.

| Investment Criteria | Value                |
|---------------------|----------------------|
| NPV (Rp)            | Rp 81.345.525.538,00 |
| Net B/C             | 1,02                 |
| IRR                 | 0,12                 |
| PBP                 | 8 tahun              |

The NPV of a project is the difference in PV of the revenue stream with the PV current of costs. Based on the calculation results, the NPV of Rp. 81,345,525,538.00 was obtained. This value indicates that the industrial factory inflow over a period of 30 years at an interest rate of 11.2 percent was greater than the cash outflow, so the establishment of the business carried out was profitable and feasible. in the long run because the NPV produced is greater than zero (NPV > 0).

Net B / C Ratio is an additional net benefit or net value currently received by a business during the life of the business at a certain interest rate. The PI or Net B / C value in the rice milling business is 1.02. This value shows that every Rp. 1 of the costs incurred will generate a profit of Rp. 1.02 Because of the PI value > 1, the establishment of this business is profitable and feasible to implement.

IRR shows the ability of a project to produce a return on capital for companies that make investments during the project and are expressed in units of percent. The IRR value obtained in a rice mill factory is 12% (DF = 11.2%), meaning that the project carried out by the company has a project return on

investment that is issued at 12%. This shows that the return on capital used is greater than the discount rate used.

Payback period (PP) or investment return period is a calculation of the length of time required by a project to be able to return the initial investment costs. The results of the analysis of the payback period based on the present value with a discount rate of 12 percent, show that to recover the value of the investment that has been made takes more than 8 years. The value is lower than the life of the project, which means that after this period, the company can return the capital spent on the rice mill business so that it is feasible to run.

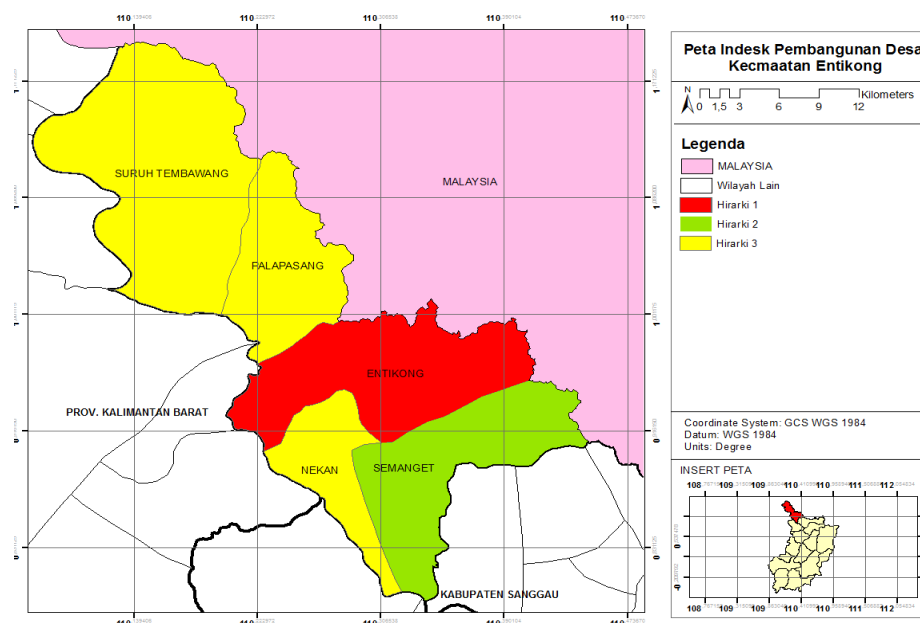
#### 4.4. Supply chain of rice agro-industry

**Table 8.** Supply chain of agro-industry.

| Part                               | Coverage of activities, among others                                                                                                                                                                  |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Productive Rice Planting           | Designing development using superior seeds, involving rice farmers in production                                                                                                                      |
| Procurement of superior rice seeds | Choosing the best / superior seed yields, evaluating the production of farmers, purchasing raw materials and components, monitoring yields and marketing rice helps farmers in producing the results. |
| Rice Production Planning & Control | Demand planning, demand forecasting, capacity planning, production planning and inventory.                                                                                                            |
| Production/operation               | Production execution, quality control at the farmer and market level                                                                                                                                  |
| Shipping / Distribution            | Distribution network planning, shipping scheduling, looking for and maintaining relationships with shipping service companies, monitoring service levels at each distribution center.                 |

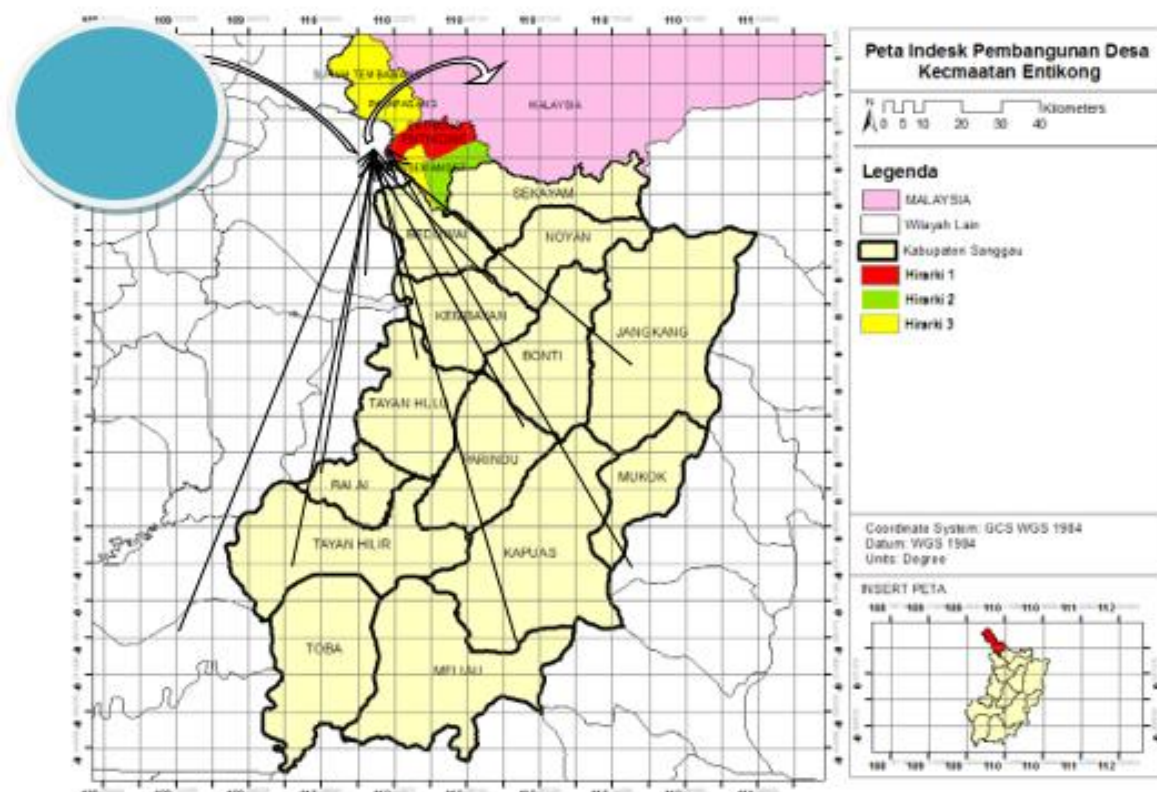
#### 4.5. Scalogram analysis

The results of the analysis show that the highest village development center is Entikong Village. Entikong village is the government center of Entikong District has more complete facilities, shows that access to public services in this village is very good if it is built by the agricultural industry. In addition, Entikong Village also has a development budget that is relatively larger compared to other villages. So, Entikong Village can build an agricultural industry in processing pepper and rice.



**Figure 3.** Village development index maps.

In the activities of developing rice and pepper agroindustry, Entikong Sub district cannot rely on raw materials from its own territory. Entikong Sub district must cooperate with surrounding areas to supply production input. This is done in order to achieve economies of scale in the production process. Entikong Sub district needs the surrounding area as an industrial product market. the flow of input and output distribution of the rice and pepper industry can be seen in the following figure:



**Figure 4.** Flow chart of pepper processing industry.

For rice agro-industry businesses, processing center is carried out in Entikong Village. That the raw material taken from villages in Entikong Sub district and in Beduai Sub district, Sekayam Sub district, and Noyan Sub district. Annual rice production in Entikong Sub district reaches 1950.91 tons, Beduai Sub district is 8983.58 tons, Sekayam District is 11079.35 tons, and Noyan District is 7597.35 tons. The factory can work effectively and efficiently when raw materials sourced from these 4 sub-districts. Meanwhile for the distribution pattern of rice agroindustry as below:

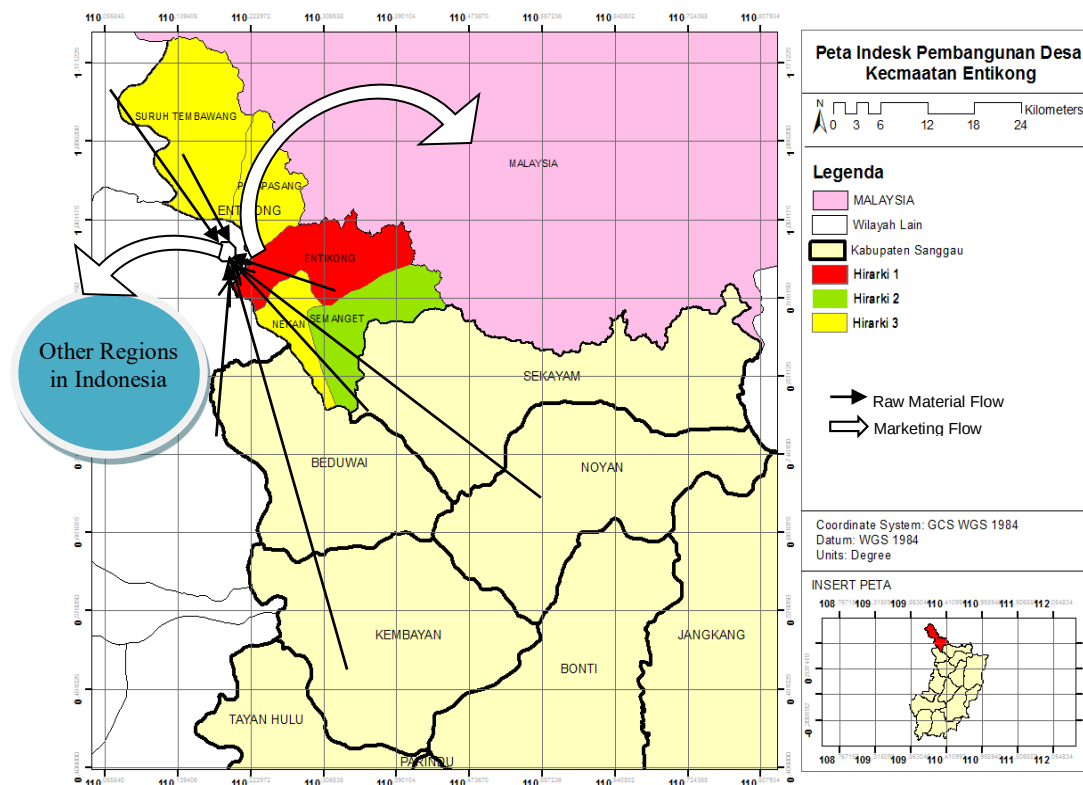


Figure 5. Rice milling agro-industry map.

## 5. Conclusion

Developing the industry plays an important role in increasing added value from local income, increasing employment in the future will expand the service / service sector, increase facilities and infrastructure, then provide benefits to all parties involved. Especially industrial estates, has become a necessity in an area, especially the border area. This is done to increase regional economic activities and increase regional income and regional development. Entikong as a border has major industries such as pepper and rice. The development of these two products is expected to provide additional value. The carrying capacity of the type of area and economic analysis shows that the pepper and milling industry in the border area is feasible to develop. Activities in the pepper processing industry include the development of pepper products, procurement of pepper products, planning and control of production, processing, product delivery. Industrial development in need of intensive activities includes productive rice planting, procurement of superior rice seeds, planning and control of rice production, harvesting, milling and shipping. The Border Industrial Area is centered on Entikong Village, Entikong Sub district, by involving surrounding villages and sub-districts as providers of raw materials. The pepper processing industry receives raw material supplies from all sub-districts in Sanggau District. Raw material of rice argo-industry supplies from Entikong District, Beduai District, Sekayam District, and Noyan District.

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