The Analysis of Characteristics of the Metal Industry as One of the Main Sectors in Tegal District

By:

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Introduction

- Tegal District is one of the regencies in Central Java Province, which has the industrial sector as one of the main economic sectors.
- The BPS (2020)[1] publication entitled "Gross Regional Domestic Product of Tegal District by Business Field 2015-2019" stated that the processing industry, including the metal industry, has a reasonably significant role in Gross Regional Domestic Product (GRDP)
  2017 = 34.69%; 2018 = 34.30%; 2019 = 34.60%
- The metal industry in Tegal District has characteristics that are pretty interesting to study because they are spread relatively evenly in each sub-district.
- However, the metal industry in Tegal District is mainly in Adiwerna and Talang sub-districts.
- Concerning the vital role of the metal industry in contributing to the economy of Tegal District, it is necessary to study the characteristics of the metal industry in Tegal District.
- This study aims to analyze the characteristics of the metal industry in Tegal District, which has different conditions and characteristics from the metal industry in other regions.
Research Method

• Research on the characteristics of the metal industry was carried out in Adiwerna and Talang sub-districts in Tegal District.

• The purposive sample method was used to obtain information on 33 respondents who owned metal industries in Adiwerna and Talang sub-districts.

• This study uses a questionnaire as an instrument to determine the conditions of input, management, and output in the metal industry.
Table 1. Outline of the Characteristics of Metal Industry in Tegal District.

|       | Input | Management | Output | Total | Category |
|-------|-------|------------|--------|-------|----------|
| Weight | A     | B          | C      | D     | E        | F        | G        | H | I | J |         |
| Industry X |       |            |        |       |          |          |          |   |   |   |         |

Description: A: Type of raw material; B: Use of technology; C: Product specialization; D: R & D innovation; E: Knowledge & business skills; F: HR development; G: Cooperation network and social capital; H: Marketing reach; I: Waste; A: Product standard.

Table 1 explains that each variable in the input, management, and output factors has different weights. The scoring rules are based on the availability of factors in each description. If it meets the criteria, it is given a score of 2, and if it is not met, it is given a score of 1.

Furthermore, the researcher uses the Sturges method to get a range of values in determining the metal industry into the categories of advanced, developing, and underdeveloped industries. Then, a map of the characteristics of the metal industry will be made. The metal industry characteristic map was created using QGIS software.
Research Result and Discussion

• The research was carried out in two sub-districts, namely Adiwerna and Talang sub-districts.

• The distribution of respondents in this study was ten respondents in Adiwerna sub-district and 23 respondents in Talang sub-district.

• Table 2 explains the ratings used in classifying metal industries.

Table 2. Industrial Classification Rating Range

| Industry category | Value range |
|-------------------|-------------|
| Underdeveloped    | 3,0 – 3,8   |
| Developing        | 3,9 – 4,7   |
| Advance           | 4,8 – 5,6   |
a. Regional Profile and Metal Industry in Adiwerna and Talang Sub-Districts

• As an urban area, the livelihoods of the majority of the population in Adiwerna sub-district are in the trade sector (33.34%) and industry (31.62%). The number of the Metal, Machinery, and Electronics Industry (ILME) group reached 314 industries with the absorption of 1,395 workers (BPS, 2020)\(^2\)

![Fig. 1. Metal industry group in Adiwerna Sub-District](image)

• Figure 1 explains that seven metal industries in Adiwerna District are categorized as small industries, two metal industries are organized as home industries, and only one metal industry is classified as a medium industry.

• Meanwhile, Talang sub-district is an urban area with most of the population working in the industrial sector (41.05%) and trade (21.29%).
The small and micro business sector of the Metal, Machinery and Electronic Industry (ILME) group in Talang sub-district is 68 industries with 257 people (BPS, 2020)[3].

Fig. 2. Metal industry group in Talang Sub-District

- Figure 2 illustrates that most of the metal industries in Talang District are categorized as home and small industries, with 10 and 11 industries, respectively.
- There are only two metal industries in Talang District categorized as medium industry and no industry with advanced category.
- The findings of the condition of the metal industry are the same as the findings of Bappenas (2004)[4] that, in general, the metal industry in Tegal District is dominated by small-scale and household industries. Some of these metal industries are managed simply with some weaknesses.
- According to Sukardi (2011)[5], some of the weaknesses of small industries include independent management, relatively small size, and structural and cultural weakness.
Most of the metal industries in Adiwerna and Talang sub-districts already have product specialties. 9 out of 10 industries in Adiwerna sub-district and 9 out of 12 Talang sub-district have produced specific and specialized products.

The products produced by the metal industry in Adiwerna and Talang sub-districts are very diverse, such as automotive spare parts, shipping equipment, water pump tubes, or mosque domes (Figure 3).

One common thing commonly encountered is that metal industries located in the same village or metal industrial complex usually have the same product type.

Fig. 3. Some metal industrial products in Tegal District, include: (a) motorcycle tanks, (b) water pump tanks, (c) boat lights, (d) mosque domes.
• Cooperation networks can be used to describe the industry's level of social capital and trust (Bappenas, 2004)[4]

• The collaboration network between business and the government, the cooperation network between business and supporting institutions, and the cooperation network between business and supporting institutions are the three types of business connections studied in this study.

• The findings reveal that in Tegal District, there are several sorts of metal industry cooperation connections (Table 3).

**Table 3.** Types and forms of metal industry cooperation

| Type of Cooperation Relationship | Stakeholders                                                                 | Form of cooperation                                      |
|----------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------|
| Inter-industry collaboration     | Small and medium scale business                                               | Preparation of semi-finished goods                       |
| Cooperation between business and government | Industry and Coperative Office of Tegal District & UPTD Industrial Laboratory / LIK Takaru | Production and ISO training, welding, tax reporting, administrative, quality control, exhibition |
| Business cooperation with supporting institutions | YDBA, PT Hanken Indonesia                                                    | Industrial management training and managerial           |
b). Analysis of the characteristics of the metal industry in Tegal District

Figure 4 shows the distribution and classification of metal industries in Adiwerna sub-district. In this study, three industries in Adiwerna sub-district were classified into underdeveloped industries, six as developing industries, and only one as an advanced industry.

One metal industry in Adiwerna sub-district classified as an advanced industry is Tiga Saudara Manufaktur. This industry is engaged in the automotive sector by providing spare parts and supplies to Astra Motor.

This industry is classified as an advanced industry for three reasons:

• This industry has products specialized in the form of motorcycle spare parts.
• This industry has a worker that has a higher education background.
• This industry has a good relationship with the government, supporting institutions, or related industries.

Fig. 4. Map of metal industry classification in Adiwerna Sub-District
• Figure 5 illustrates the distribution and classification of metal industries in Talang Sub-district.

• One of the three metal industries that fall into the advanced category is UD. Mirafix. UD. Mirafix is a small-scale metal industry that produces gas stove spare parts. This industry produces and has shops that sell several small and extensive spare parts from gas stoves.

• There are two reasons UD. Mirafix belongs to the advanced industry category. First, UD. Mirafix is the only metal industry that registers its products to obtain IPR. This industry is applying for IPR registration for one of its products, namely a one-burner stove named “Geni Biru”. Second, UD. Mirafix has a perfect relationship with the Industry and Cooperative Office of Tegal District. The industry also often gets training for its workers from the service.
Conclusion

• The metal industry in Tegal District has a vital role in the regional and national economy. The metal industry is one of the most significant contributors to the GRDP of Tegal District and has relatively good absorption of labour. At the national level, the metal industry in Tegal District is proven to support the needs for equipment and components of the national industry.

• However, most of the metal industries in Tegal District are home and small industries with weak capital and resources, making them vulnerable to environmental instability. For example, most of the metal industry is not producing due to the scarcity of oxygen gas known as production fuel due to the Covid-19 pandemic.
Reference

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[4] Bappenas. Kajian Strategi Pengembangan Kawasan Dalam Rangka Mendukung Akselerasi Peningkatan Daya Saing Daerah Studi Kasus : Kelompok Industri Rotan-Cirebon, Logam-Tegal, Batik-Pekalongan. ____ : Bappenas; 2004.

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