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ANALYSIS OF DECISION SUPPORT CRITERIA TYPE OF HOME INDUSTRY BUSINESS BASED ON ANALYTICAL HIERARCHY PROCESS

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Abstract: This research was conducted in the Bangka Belitung region specifically observing what criteria could support and hinder the development of home industries. The home industry is a small-scale industry that is generally carried out in the family sphere and is driven by women. Home industries need to receive support from the provincial government to survive and increase the scale of production. To make support for home industries more targeted, this research summarizes several criteria related to the conditions of home industries and the businesses they run. In Bangka Belitung Province there are several types of businesses that are run on a home industry scale. Based on the condition of the home industry which has multiple criteria and multiple alternatives, this research uses the Analytical Hierarchy Process method and Expert Choice software as data processing aids. The results of data processing show that industrial business is the highest alternative with a weight of 24.7% and the highest criterion is strategy at 23.7%. These results indicate that the largest portion of home industry business actors is engaged in the industrial sector and to encourage the progress of the home industry the most important factor is strategy, namely understanding the type of business they are involved in, labor-intensive industries, paying attention to production factors, electricity capacity, and business operations. While the next stage is to design a user interface for a web-based system as a means of collecting home industry data.

Keywords: AHP; collecting home industry data; home industries

Abstrak: Penelitian ini dilakukan di wilayah Bangka Belitung secara khusus melihat kriteria apa saja yang dapat mendukung dan menghambat perkembangan industri rumah tangga. Industri rumah tangga merupakan industri kecil yang umumnya dilakukan dalam lingkup keluarga dan digerakkan oleh perempuan. Industri rumah tangga perlu mendapat dukungan dari pemerintah provinsi agar bisa bertahan dan meningkatkan skala produksinya. Agar dukungan industri rumah tangga lebih tepat sasaran, penelitian ini merangkum beberapa kriteria terkait kondisi industri rumah tangga dan usaha yang dijalankannya. Di Provinsi Bangka Belitung terdapat beberapa jenis usaha yang dijalankan dalam skala industri rumah tangga. Berdasarkan kondisi industri rumah tangga yang memiliki banyak kriteria dan banyak alternatif, maka penelitian ini menggunakan metode *Analytical Hierarchy Process* dan *software Expert Choice* sebagai alat bantu pengolahan data. Hasil pengolahan data menunjukkan bahwa bisnis industri merupakan alternatif tertinggi dengan bobot 24,7% dan kriteria tertinggi adalah strategi 23,7%. Hasil tersebut menunjukkan bahwa porsi terbesar pelaku usaha industri rumah tangga bergerak di sektor industri dan untuk mendorong kemajuan industri rumah tangga faktor yang paling penting adalah strategi yaitu memahami jenis usaha yang digeluti, industri padat karya, pembayaran, memperhatikan faktor produksi, kapasitas listrik, dan operasional usaha. Sedangkan tahap selanjutnya adalah merancang antarmuka untuk sistem berbasis web sebagai sarana pendataan industri rumahan.

Kata kunci: AHP; industri rumahan; pendataan industri rumahan

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INTRODUCTION

In PPPA Ministerial Regulation No. 2 of 2016, the definition of the home industry is described as a system that produces unique handmade products that contain elements of local wisdom, the process of which is initiated by women within the family circle[1]. The home industry is the forerunner of MSMEs which are currently proven to be able to become one of the supporters of a strong economy in Indonesia.

The Bangka Belitung Archipelago Province which geographically has abundant marine and mining resources, has made home industry entrepreneurs in Bangka Belitung produce products derived from marine or mining resources. Utilization of natural resources to support the competitiveness of home industry centers, especially the typical Bangka food industry in Pangkalpinang City, shows that home industries need support from city government policies such as providing export opportunities, providing training, and access to other production support sources[2].

There are quite a lot of home industry players in Bangka Belitung who choose to develop food businesses that originate from seafood. One of them is the production of squid chips which are produced in the kritcu maker community in Batu Behole Village. Production results can increase family income[3].

Another positive development in the home industry in Bangka Belitung is that the home industry can absorb a significant amount of labor as seen from the variable number of industries, investment variables, and independent variables[4].

in Kurau Village, the home industry produces brittle and kemplang which are special foods made from fish, shrimp, or squid. The home industry has proven to be able to improve the people's economy with the existence of employment, especially for housewives who live around the location of the home industry[5].

Apart from processed seafood, the leading home industry based on the processing industry in Bangka Belitung is the rubber and rubber goods industry. The rubber industry and its derivative products are superior competitively and comparatively considering that Bangka Belitung is one of the exporters of rubber raw materials[6].

Belitung Island has boosted its home industry to manage agricultural products which are marketed to tourists visiting Belitung Island. So that the results of the agricultural home industry are correlated with the trade, hotel, and restaurant sectors, as a means of supporting tourism[7].

Apart from utilizing natural resources, home industries also need technological support. One of the appropriate technologies to support the home industry is making brown sugar grinding and mixing machines for the production of traditional cakes such as kue putu, such as those produced by IKM Kue Putu in Pangkalpinang. The support of a brown sugar crusher and mixer machine can increase production capacity to double the size[8].

Another unexpected factor was the emergence of the Covid-19 pandemic which also affected the production and marketing of home industry products in Bangka Belitung. Government support to support home industry players affected by the pandemic, one of which is to improve digital marketing facilities and training that can expand the market[9].

The variety of home industry businesses in Bangka Belitung refers to PPPA Regulation No. 2 of 2016, home industries are divided into three classes,

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namely beginner, developing, and advanced[1].

The data for the home industry that has been collected does not match the classification stated in Permen PPPa No. 2 of 2016, and some of it is mixed with MSME data. This is what prompted this research to make an assessment analysis of home industries and at the same time map the location of these industries with a geographic information system. Use of GIS to map the location of rice planting land in Simalungun Regency. The location of rice planting that is recorded by GIS makes it easier for the relevant agencies to monitor agricultural locations[10].

The use of geographic-based information systems has been carried out in several regions in Indonesia as follows, in West Bandung Regency, with GIS it can be seen that the geographic location of creative industry players is generally engaged in the handicraft, culinary, and fashion sectors[11]. Registering Small and Medium Industries (IKM) in Jayapura City. This GIS also provides travel routes to IKM locations along with maps [12]. In Cilacap Regency, home industries are recorded with a geographic information system as a guide for potential customers who are looking for creative industry locations with coordinate points. [13]. In Indragiri Hulu Regency, the Department of Industry and Trade uses an Android-based Geographic Information system to monitor the development and progress of businesses in Small and Medium Industries [14]. In Tembilahan City, GIS is used to map the locations of tailors. The resulting GIS can provide route information and estimated distance traveled from the user's position [15]. In Majalengka Regency, the result of the development of this system is information on the location of MSMEs which are recorded in the form of coordinates of longitude and latitude points[16]. In Mataram City, GIS is to make it easier for customers to find IKM locations, this system is used by the Industry Service to make it easier for IKM actors to get Industrial Registration Certificates [17].

Based on some of these studies, the home industry in Bangka Belitung also needs location data and type of business. The data collection aims to make it easier for relevant agencies to find out the number, type of business, business owners, and location of home industry businesses. Furthermore, related agencies can develop and support appropriate facilities for the advancement of home industries. With accurate data collection using coordinate positions on Google maps, it is hoped that it will be able to facilitate customer access to buy home industry products.

The initial step of this research is to compile an analysis of what criteria are the supporting and inhibiting factors for home industry businesses as well as what types of business alternatives are most developed by home industry business actors in Bangka Belitung. To compile an analysis of these criteria and alternatives, this study uses the Analytical Hierarchy Process (AHP) method which is capable of providing a systematic assessment of multi-criteria and multi-alternative conditions.

METODE

The Analytical Hierarchy Process (AHP) is a method developed by Thomas L. Saaty which compares two values obtained from expert judgment based on a priority scale. This priority scale represents how a value is more dominant than other values[18].

Thomas L. Saaty argues that mak-

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ing decisions based on numbers and not based on words or language is progress considering that decisions made based on numbers can reduce conflict[19].

This research uses Multi-Criteria Decision Making (MCDM), Multi-Attibute Decision Method (MADM), and Analytical Hierarchy Process (AHP). The use of this method is following research needs that have multiple criteria and multiple alternatives, and requires analysis and ranking results as a solution. Processing research data using the AHP method is easier using the Expert Choice software which is designed to follow the comparison values in AHP[20].

Expert Choice is software that can accurately compare priorities according to the AHP method. Expert Choice is also able to combine the results of comparative assessments of several expert assessment inputs, the results of the comparison are then calculated for the value of sensitivity analysis which can be displayed in graphical form[21].

Images 1 and 2 are the research steps and detailed steps carried out during data analysis using the AHP method.

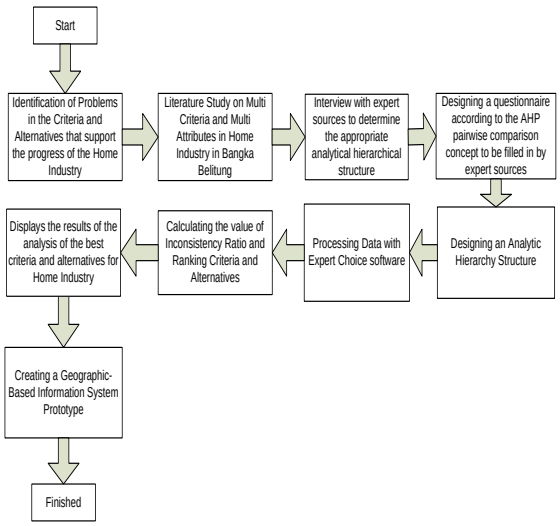

Image 1. Research Steps.

The research begins by identifying the problem that becomes the goal, then the goal is dispositioned into criteria and several alternatives that support the achievement of the goal. Furthermore, the researcher conducted a literature study to obtain some similar research results that support the placement of multi-criteria and multi-attributes in the home industry in Bangka Belitung. After getting the design criterias and alternatives that are following the conditions of the home industry, the researchers conducted interviews with expert sources who mastered the material. Based on the results of these interviews, the researcher designed a questionnaire that refers to the AHP pairwise comparison concept. The questionnaire was filled out by expert sources. The results of the questionnaire provide an overview of the analytic hierarchical structure. Questionnaire result data processing is done by Expert Choice software. Expert Choice calculates the value of the inconsistency ratio along with the ranking of criteria and alternatives. Expert Choice displays the processing results in graphical form, the criteria with the highest ranking and the highest alternative in the home industry analysis. Furthermore, designing a geographic-based information system prototype for home industry mapping.

The following is the sequence of data processing in AHP. The first is to define the objectives, criteria, and alternatives in the analytic hierarchical structure. Then rank the criteria and alternatives by calculating pairwise comparisons with the values specified in the AHP. Then the results of the calculation of pairwise comparisons are calculated for the level of priority, both relative priority and global priority. After the priority results, then check the consistency value so that it does not exceed 0.1, and finally

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check the results of the sensitivity analysis as a whole.

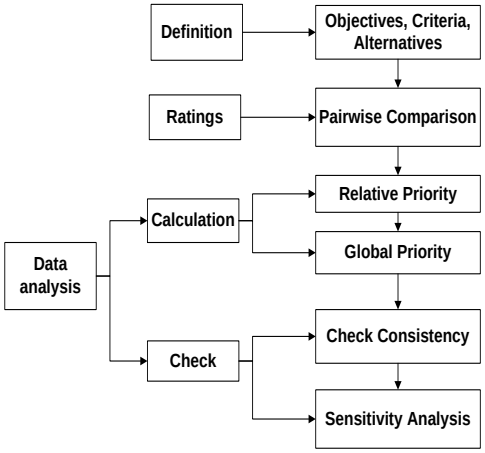

Image 2. Stages of IR Data Analysis with the AHP Method

RESULTS AND DISCUSSION

The results of this study show the results of data processing processed by the AHP method with the support of Expert Choice software. The results are presented in the form of a treeview which shows the percentage weight of the criteria and alternative weights for each level, as described below. The results of data processing using the AHP method and Expert Choice software are presented in the form of a treeview, this view presents the results of the percentage of criteria and alternatives at once. Image 3 below shows the results of level 1 data processing with the criteria and alternatives.

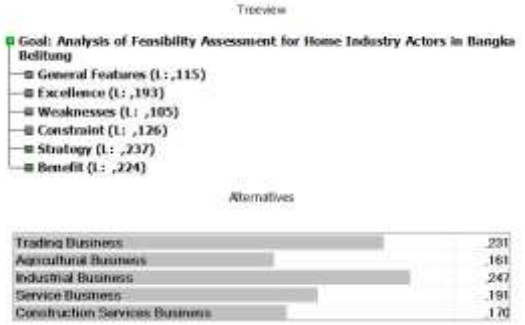

Image 3. Treeview of Level 1 Criteria

In Image 3, the criteria for level 1, the highest criterion is the strategy with a weight of 23.7% and the type of business selected is an industrial business with a weight of 24.7%.

The following is Image 4 which shows the results of ranking the level 2 criteria of the General Features criteria and their alternatives.

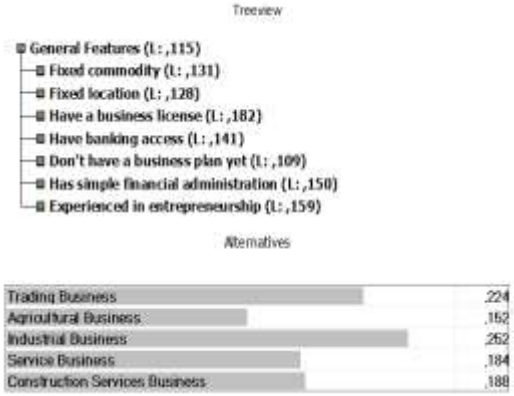

Image 4. Treeview Criteria for Level 2 General Features

In Image 4, the criteria for level 2 Sub Criteria for General Features, the highest criterion is having a business license of 18.2% and the type of business selected is industrial business with a weight of 25.2%.

The following is Image 5 which shows the results of ranking the level 2 criteria of the Excellence criteria and their alternatives,

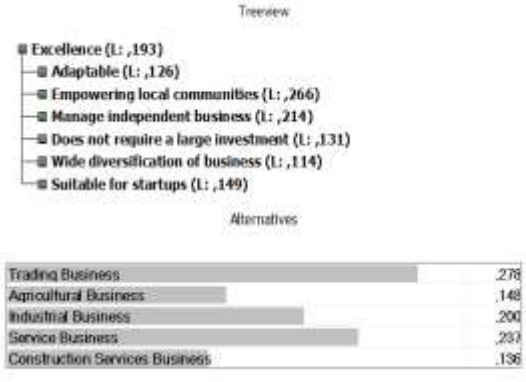

Image 5. Treeview Criteria for Level 2 Excellence

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In Image 5, the criteria for level 2 Sub Criteria for Excellence, the highest criterion is empowering the community around 26.6% and the type of business chosen is trading business with a weight of 27.8%.

The following is Image 6 which shows the results of ranking the level 2 criteria of the Weaknesses criteria and their alternatives,

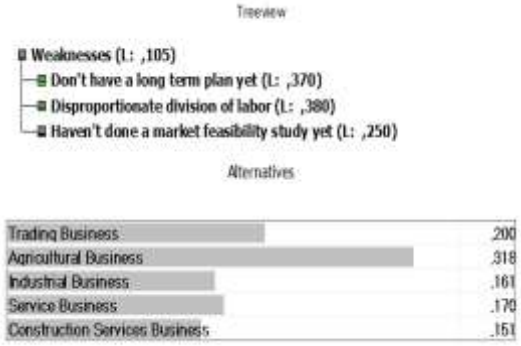

Image 6. Treeview Criteria for Level 2 Weaknesses

In Image 6, the criteria for level 2 of the Weaknesses Sub Criterion, the highest criterion is the disproportionate division of labor of 38% and the type of business selected is an agricultural business with a weight of 31.8%.

The following is Image 7 which shows the results of ranking the level 2 criteria of the Constrains criteria and their alternatives,

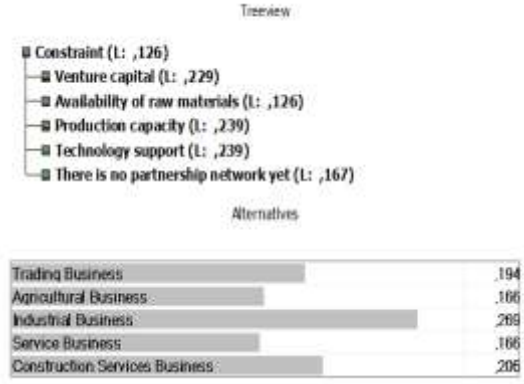

Image 7. Treeview Criteria Level 2 Constraints

In Image 7, the criteria for level 2 Sub Criteria for Constraints, the highest criterion is business capital 22.9% and the type of business selected is an industrial business with a weight of 26.9%.

The following is Image 8 which shows the results of ranking the level 2 criteria from the Strategy criteria and their alternatives,

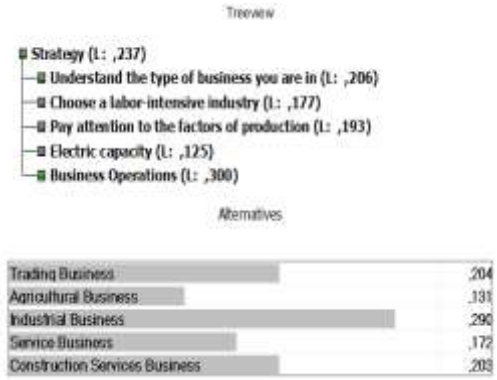

Image 8. Treeview Criteria Level 2 Strategy

In Image 8, the criteria for level 2 of the Strategy Sub Criteria, the highest criterion is the division of business operations at 30% and the type of business selected is an industrial business with a weight of 29%.

The following is Image 9 which shows the results of ranking the level 2 criteria of the Benefit criteria and their alternatives,

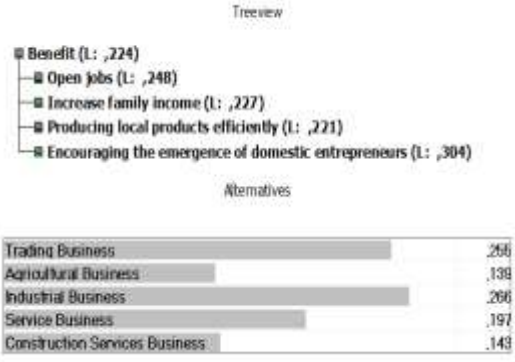

Image 9. Treeview Criteria for Level 2 Benefit

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Overall the results of data processing can be presented with some interesting graphs as follows,

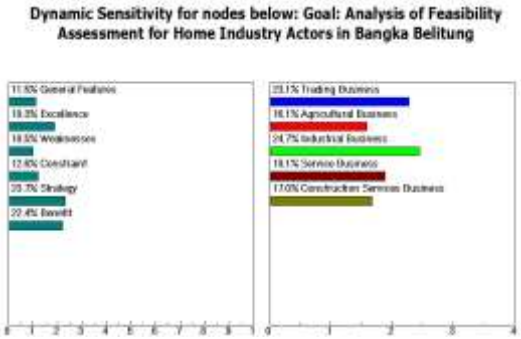

Image 10. Dynamic Sensitivity Graph

Display results with sensitivity Graph Dynamic are the percentage of criteria and alternatives side by side. In addition to dynamic, the following shows the results in the form of a performance graph.

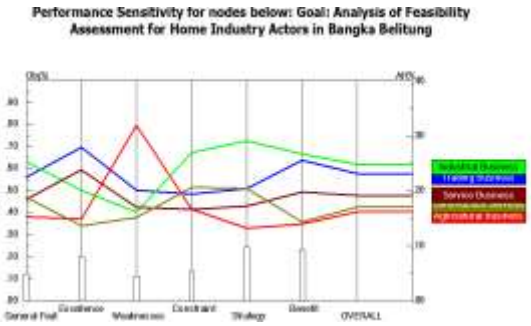

Image 11. Sensitivity Graph Performance.

The last is to display the alternative ranking results which are presented based on the Combined Instance - Synthesis to the goal, as follows,

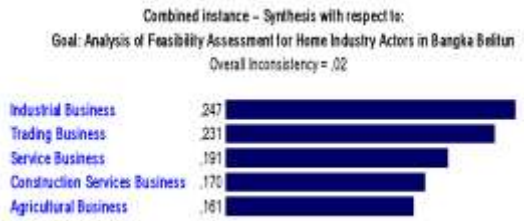

Image 12. Synthesis Respect to goal

Referring to the need to record home industries based on location, the following are some of the user interface screen results that show how home industries are recorded for location, type of business, and products produced, as shown in Images 13, 14, 15 below,

Image 13. Screen Display of Users Looking for Home Industry

Image 13 displays a form that guides users in searching for home industries which can be searched by location and class of business

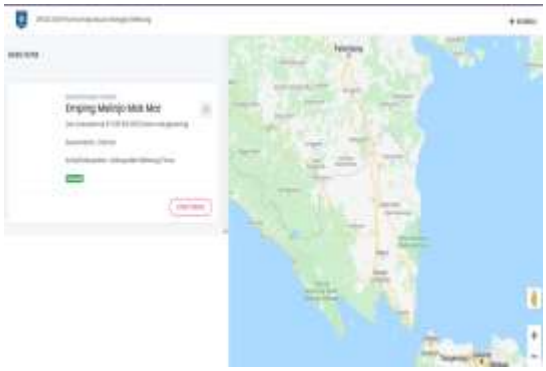

Image 14. Screen Display directing the map to the location

Image 14 shows a screen that helps users to get industrial locations on a map. With the appearance of a location, users can easily access certain industry addresses

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Image 15. Screen Display directing the map to the location

Image 15, the image above shows the details of the name, address, sub-district, district/city, and business scale.

CONCLUSION

The various types of businesses that are carried out by business actors in the home industry in Bangka Belitung make the relevant agencies in the Provincial Government need accurate data support regarding location positions, types of businesses, as well as several constraints, strategies, and industry advantages home. This research makes an analysis outlining the criteria that show what drives and hinders the progress of alternative home industries in the form of several types of industrial businesses that are developing in Bangka Belitung. Data processing was carried out using the Analytical Hierarchy Process method and Expert Choice software which gave the highest criterion results, strategy with a weight of 23.7%, the second criterion of benefits at 22.4%, the third criterion of excellence at 19.3%, the fourth criterion for constraints is 12.6%, the criteria for general characteristics are 11.5%, and the last criterion for weakness is 10.5%. While the highest alternative is the industrial business at 24.7%, the second alternative is the trade business at 23.1%, the third alternative is the service business at 19.1%, the fourth alternative is the construction business at 17%, and finally, the last alternative is the agricultural business 16. 1%. As a form of implementation of home industry data collection in Bangka Belitung, this study presents an interface design that shows the pattern of registering home industries based on a geographic information system that makes it easy to map locations based on Google Maps.

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