The development of honey pineapple jam production facilities in Bantaeng Regency

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Abstract. Bunga Resky pineapple jam processing industry is located in Bantaeng Regency, which processes pineapples obtained from its own managed land. This industry has the potential with abundant fruit production during the harvest season. However, there are limitations related to the layout of the production facilities. The purpose of this research is to determine the pattern of development design in the pineapple jam processing industry at UKM Bunga Resky in Bantaeng Regency using Activity Relationship Chart (ARC) and BLOCPLAN. There are 20 alternative layout options generated by the BLOCPLAN method, with the layout selected based on the R-Score values approaching 1 and the lowest rail-dist score while considering the existing conditions in the industry. The selected layout is the layout 8, chosen because it has the best production flow suitability.

1 Introduction

Marketing of pineapple fruit often experiences problems, namely the low price of pineapple fruit during the main harvest. Therefore, currently pineapple is not only marketed in the form of fresh fruit but is also marketed in processed form. Processing is the right solution so that pineapple fruit can be stored longer, by processing it can increase its shelf life for longer with guaranteed quality and safety. The pineapple fruit processing industry is a priority for handling pineapple plants which continues to be developed, apart from producing abundant fruit, increasing quality and shelf life, opening fields jobs, development of the pineapple processing industry can also help improve the economy. Pineapple entrepreneurs also open up additional job opportunities from processing various types of derivative products and by-products [1].

The progress of the Indonesian economy cannot be separated from the development of the agricultural product processing industry, both small and medium scale industries and large scale industries. UKM Bunga Resky is a small and medium industry which operates in the field of processing agricultural products in the form of processed pineapple honey jam which is located in Pattalassang village, Tompobulu Distric, Bantaeng Regency. Bantaeng Regency is one of the areas in South Sulawesi with pineapple production which continues to

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increase in production from year to year. Data from the Central Statistics Agency records that pineapple production in 2018 reached 20.8 tonnes of fruit, in 2019 there was an increase in production which reached 60.2 tonnes of fruit and increased again in 2020 with production reaching 154.1 tonnes of pineapple [2]. This data provides an opportunity for the industry to develop its production process because pineapple production in Bantaeng Regency continues to experience an increase in production.

In running its business, UKM Bunga Resky still has limitations in utilizing existing business opportunities. These limitations are related to production capacity which has not been carried out optimally, the use of derivative products or by-products from pineapple which has not been carried out and the design of production facilities which require an alternative development so that the industry can survive and obtain maximum profits according to industry goals. Designing production facilities is important in industrial development, especially in the agricultural products industry. To realize the development of the agricultural industry in increasing processing excellence, a design of production facilities, standardization of machines or equipment and appropriate and efficient flow of materials is needed so that the production process runs smoothly and in accordance with production needs. The aim of designing a factory layout is to minimize the costs that the company needs to incur for the production process and transportation within the factory in order to increase efficiency in arranging production facilities and work areas [3]. Based on this, it is necessary to carry out research regarding industrial development design for UKM Bunga Resky so that it can survive and develop and obtain maximum profits.

2 Methods

The first step that must be taken before conducting research is to conduct a preliminary study. A preliminary study was carried out on UKM Bunga Resky which was the object of research by knowing the general description of the home industry including the initial layout. Designing development patterns for the pineapple jam processing industry was carried out by analyzing the industrial layout using the method Activity Relationship Chart (ARC) by analyzing the relationship between facility attachments measured qualitatively using a measure of the degree of closeness of the relationship between one facility and another. This analysis was carried out after data on factory space requirements, size of equipment and machines and industrial layout. Value indicating the degree of relationship are recorded along with the underlying reasons in the ARC activity relationship map had been developed by Richard Muther in his book Systematic layout Planning [4]. BLOCKPLAN used attachment maps as input data to produce random layouts as a development alternative. The criteria used in selecting industrial layout development layouts are minimum production costs, suitability of production flow, suitability of infrastructure. Results layout BLOCKPLAN assessed the suitability of criteria in facility design that can be used to assess factory layout, according to Suad Husnan and Swarsono in [5].

3 Results and Discussion

UKM Bunga Resky has a processing house as a place to process raw materials through to the product packaging process. The initial stage of ARC is to determine the departments and facilities that must be owned. The department design consists of a raw materials room, pre-processing room, processing room, office and product storage, quality testing room, rest room, waste disposal room and parking. Structuring and processing facility flows is important for industry to produce effectiveness and efficiency of facility flows. The relationship between the activities of UKM Bunga Resky can be seen in Figure 1.
Based on the ARC results, the next stage is to input the attachment value obtained. The attachment map obtained can be seen in Figure 2.

The scoring for each department was determined by the BLOCKPLAN user or follow the values determined by the system. The results of data processing using BLOCKPLAN software obtained 20 alternative random layout designs along with their scores which can be seen in Figure 3.
Based on the results of algorithm iteration BLOCKPLAN in Figure 3 there are 20 layouts of the layout plan produced. Then the selected layout can be seen from ADJ SCORE, R SCORE the highest or closest to 1 is layout 8 with a layout score of 0.96 which is then proposed as the best alternative. Layout 8 based layout plans BLOCKPLAN can be seen in Figure 4.

Fig. 4. Output Layout of BLOCKPLAN.

The design of the layout of UKM Bunga Resky's processing house aimed to find more effective alternatives in the production process. Based on the results of observations made at UKM Bunga Resky, the initial layout conditions did not follow any special rules, did not take into account the degree of closeness and effectiveness of the production process. Based on the layout design results obtained, the resulting layout design conditions were more effective given the current conditions. This was because in the design and placement process departments are assessed from the aspects of the degree of proximity of facilities, suitability of production flows, factory space requirements and based on the size of the equipment and machines used.

4 Conclusion

Layout 8 with an layout score of 0.96 was the best alternative development design produced by the BLOCPLAN iteration and was in accordance with production flow, factory space requirements based on the size of the equipment and machines used and can minimize production costs.

References