Research Article

Economic Empowerment of Micro, Small, and Medium Enterprises (MSMEs) in the Leather Industry through Black Soldier Fly (BSF) Magot Cultivation

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Abstract.

The leather processing industry always experiences growth every year. However, at the stage of processing leather to become raw material for a product, it produces a lot of solid waste containing hazardous materials used during the process. The resulting hazardous materials can cause pollution to the surrounding environment. Hence, there needs to be a solution to handle this solid waste, so that it does not pollute the surrounding environment. Magot Black Soldier Fly (BSF) cultivation training is a technique that can be used as a solution to process solid waste from the leather tanning industry so that it has high selling value. In a study, BSF cultivation shows circular economic results and future opportunities for investors, which will lead to increased demand. The cultivation of BSF as an alternative for processing waste into organic fertilizer and animal feed is a promising technology. It is worth inoculating, especially in countries that have low incomes with expensive fertilizer and animal feed costs. BSF maggot cultivation training was conducted for MSME players in the Sukaregang leather industry in the Garut district. The results of the evaluation were that 99% of the training activity participants felt that the training provided was very targeted and the material provided was appropriate, and easy to understand. So it can be concluded that the training provided is appropriate and beneficial for leather industry MSMEs, whoever participates.

Keywords: BSF, economic empowerment, leather industry

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1. INTRODUCTION

The leather processing industry experiences very positive growth every year in Indonesia. In 2021 the growth of the non-oil and gas processing industry contributes almost 0.25% to GDP [1]. This shows that the leather processing industry influences economic growth in Indonesia. In the leather processing industry there are products produced in the form of footwear, bags, jackets etc. Before it becomes a ready-to-use product, the leather used is first subjected to a tanning process, which aims to change leather that is easily damaged or unstable into a stable skin. Leather that has stable properties will be durable and easy to form as a raw material for a product. Every stage of

the leather processing process produces waste, the waste produced can be in solid form or liquid form. But at the stage of leather processing to become a raw material for a product, it produces a lot of solid waste containing hazardous materials used during the processing [2]. The hazardous materials produced can cause pollution to the surrounding environment, inappropriate waste treatment can hinder the industry towards sustainable growth [3]. In the process water and pollutants are discharged in very large quantities, in the pre tanning and tanning process produces almost 90% of the total pollution from leather tanning, the environment is polluted by the discharge of chemicals which have a negative impact on the ecological function of water[4]. Then solid waste that is simply thrown away and pollutes the environment will become a threat to the ecology and water around the tanning factory[4] . Even though the leather processing industry is one of the most important industries at this time, the pollution produced from this industry is very large, so it is very necessary to pay attention to how to reduce the negative impact of the waste produced [5]. The amount of waste generated from the leather tanning industry is very large when compared to the products produced from the industry. Pollution caused by the disposal of solid wastes through inefficient incineration and stockpiling processes hinders the industry's path to sustainable growth [3]. there are efforts to control the production of solid waste, develop strategies for reusing leather solid waste and make this waste have market value [2]. In the Sukaregang industrial area, for example, it can produce up to 10 tons of solid waste per month. Meanwhile, to handle the solid waste, the Sukaregang leather business must spend around IDR 3,500 per kilogram so that the solid waste can be transported and disposed of to a safe place [6]. This shows that apart from being dangerous, the waste produced also requires costs to handle. The more waste that is produced, the more costs will be incurred by leather processing industry business actors. BSF is widely used in the world to recycle organic waste into protein and high-quality feed and is a rapidly growing business [7]. In a research on BSF cultivation, it shows the results of a circular economy and there are opportunities for future investment that will lead to increased sustainability of agricultural and food systems, especially for small farmers in low- and middle-income countries [7]. A study found that BSF contains many nutrients such as protein, fat, fiber, and minerals making it suitable to be used as animal feed as a substitute for essential amino acids [8]. BSF maggot is an alternative as an environmentally friendly animal feed ingredient, its growth and development are greatly influenced by reduced nutrition[9]. In a study, it was shown that BSF maggot is an alternative used for animal feed for fish because it is rich in protein, water, fat, ash, and fiber[10]. Composting organic waste using BSF is an environmentally friendly

approach, therefore it is very attractive to people throughout the world[11]. So that later the waste from tanning leather can be used as maggot feed which has a high protein BSF cultivation as an alternative for handling waste into organic fertilizer and animal feed is a promising technology and is worth integrating, especially in countries that have low incomes with expensive fertilizer and animal feed costs [12].

2. METHODS

Magot Black Soldier Fly (BSF) cultivation training was conducted for leather industry MSMEs in Sukaregang, Garut Regency. The training was attended by 30 participants. The participants who took part in the training came from entrepreneurs and workers in the leather processing industry. In addition, there were also representatives from the Indonesian Leather Tanners Association (APKI). The aim of holding the training is to provide an idea to MSME players in the leather industry that solid waste from leather tanning can be recycled and reused, resulting in high economic value for them. Before training on BSF maggot cultivation was carried out, an explanation was given regarding the impacts of waste from the leather processing industry that was not handled seriously. Training activities were held at the Processed Food and Packaging Industry UPTD, Garut Regency on Tuesday 28 February 2023, a map of the training location can be seen in Figure 1. The training material provided was to provide understanding to MSME players in the leather industry regarding the use of solid waste from the leather tanning industry as one of the efforts towards a green industry. Then provide an explanation and carry out direct practice regarding how to cultivate BSF as in Figure 2. An evaluation is carried out by providing a questionnaire containing short questions regarding the suitability of the training material provided. The questions from the questionnaire given can be seen in Table 1.

Table 1: Training Evaluation Questionnaire.

Number	Question Type
1	Is the Maggot Black Soldier Fly (BSF) Cultivation training program held on target and according to needs? a. Very Exact b. Exactly c. Inaccurate d. Incorrect
2	Does the presenter convey material and information clearly so that it is easy to understand? a. Very clear b. Clear c. Unclear

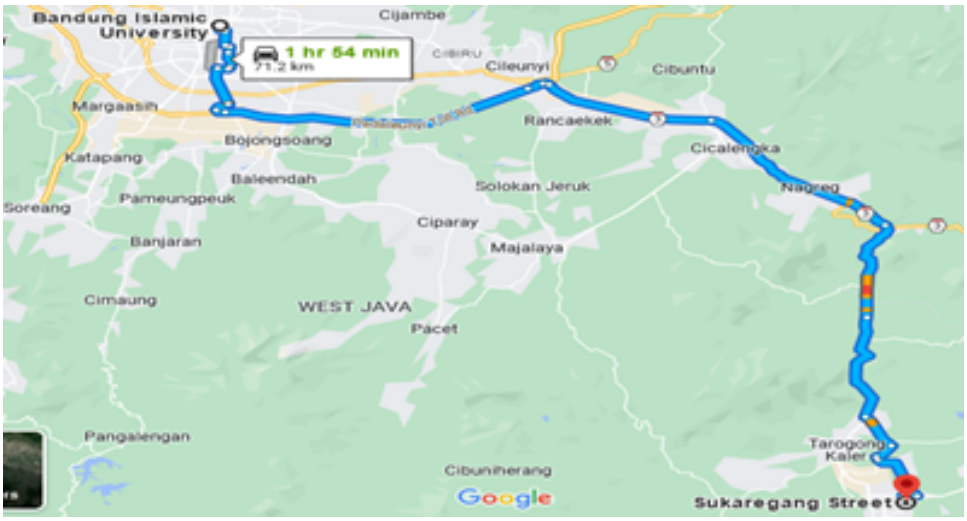

Figure 1: Training Locations.

3. RESULTS AND DISCUSSION

The Magot Black Soldier Fly (BSF) cultivation training activity aims to provide a solution to leather industry MSMEs in Sukaregang, that solid waste produced from leather tanning can be used as animal feed. So that leather processing industry entrepreneurs do not need to incur additional costs to handle the waste produced. But on the other hand, the waste produced can provide added economic value for entrepreneurs if it is used as feed for BSF maggots. A total of 30 participants took part in the training from start to finish. Apart from explaining the impact of waste on the environment and cultivating BSF maggots, all participants were directly involved in the practice of cultivating BSF maggots by providing samples of solid waste from the leather industry directly to the maggots. It is hoped that the participants will see that the solid waste produced can be fed to BSF maggots. After the training session was completed, participants were asked to complete a survey evaluation of the training carried out. As a result of the evaluation, 99% of participants felt that the training provided was very targeted and the material provided was appropriate and very easy to understand.

4. CONCLUSION

Black Soldier Fly (BSF) Magot cultivation training activities for Micro, Small and Medium Enterprises (MSMEs) in the Leather Industry are running smoothly. The participants were very interested in the training materials provided and planned to try BSF cultivation in their respective places. There is a need for further activities in the form of evaluating the understanding and interest of leather processing industry players regarding BSF

Figure 2: Implementation of Black Soldier Fly (BSF) Magot Cultivation Training.

maggot cultivation as a solution to dealing with solid waste from the leather processing industry so that it has high economic value.

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