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Innovation and Efficiency of Brick MSME Products to Realize the One Village One Product

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Abstrak

Usaha Kecil dan Menengah (UMKM) di Indonesia, khususnya di Desa Sigedong, memiliki peran yang signifikan dalam pembangunan ekonomi dan penciptaan lapangan kerja. Untuk meningkatkan inovasi dan efisiensi UMKM, program *One Village One Product* (OVOP) diimplementasikan, dengan fokus pada produksi batu bata. Inovasi yang diterapkan melibatkan penggunaan serbuk kayu sebagai bahan baku alternatif, yang diharapkan dapat meningkatkan kualitas, efisiensi, dan keberlanjutan produk. Metode pelaksanaan mencakup penyuluhan, pendampingan, dan kolaborasi dengan produsen kayu. Hasil dari inovasi ini menunjukkan bahwa batu bata yang dihasilkan memiliki kualitas yang lebih baik, efisiensi yang lebih tinggi, dan lebih ramah lingkungan, serta mendukung praktik produksi berkelanjutan. Rekomendasi tindak lanjut mencakup adopsi metode inovatif, kolaborasi dengan akademisi dan pemerintah, serta pemantauan berkala untuk memastikan keberhasilan inovasi.

Kata Kunci: *One Village One Product, Ekonomi Berkelanjutan, Produk Unggulan, UMKM*

Abstract

Small and Medium Enterprises (MSMEs) in Indonesia, especially in Sigedong Village, have a significant role in economic development and job creation. To improve innovation and efficiency of MSMEs, the One Village One Product (OVOP) program is implemented, with a focus on brick production. The innovations implemented involve the use of wood powder as an alternative raw material, which is expected to improve product quality, efficiency, and sustainability. The implementation method includes counseling, mentoring, and collaboration with wood producers. The results of these innovations show that the bricks produced are of better quality, higher efficiency, and more environmentally friendly, as well as supporting sustainable production practices. Follow-up recommendations include the adoption of innovative methods, collaboration with academia and government, and periodic monitoring to ensure the success of innovation.

Keywords: *One Village One Product, Sustainable Economy, Superior Products, MSMEs*

Introduction

Indonesia's small and medium-sized enterprises play an important role in economic development, as well as contributing significantly to employment, output, and innovation. Current conditions have presented unique challenges for MSMEs, requiring a focus on innovation and efficiency to ensure sustainability. (Khomah et al., 2021) (Zahara et al., 2020) *One Village One Product* (OVOP) is a program that is being run by the Ministry of Industry to develop clusters through Road *Maps* on commodity products or Village Superior Products. In addition, OVOP in Indonesia is a priority for national development with the stipulation of the Minister of Industry Regulation Number 14 of 2021 concerning the Development of Small and Medium Industries in MSME Centers through *One Village One Product.* OVOP has been implemented in many countries, one of which is Japan as the initiator of the OVOP program. In Indonesia, OVOP has been implemented in several regions such as Malang, Badung, Jepara, Purwakarta, Lombok, which are supported by local governments. The implementation of OVOP is expected to accelerate the increase of MSMEs and as a step in realizing a sustainable economy. In Banten, especially in Serang, OVOP has begun to be applied to several commodities with the development of centers such as aquaculture centers in several village areas around the coast. Banten has the potential to be able to develop its products into superior products of the village. In Sigedong Village, one of the MSME centers that is developing is the Brick product, this product is one of the superior products in Sigedong Village because the results of the Brick are denser and stronger than products in other areas. (Rusdiono & Darmawan Sudagung, 2024) (Murti & Harianto, 2019)

Traditionally, brick production relies on clay as the main raw material, requiring a lot of time and cost in the production process. The results of this community service examine the case of MSMEs engaged in brick production, explore strategies to increase innovation and efficiency using sawdust/wood powder as raw materials. This wood powder is obtained from wood producers whose production produces wood dust/sawdust waste that is not used, for this reason the KKM 24 Untirta service team collaborates with wood producers, to supply their wood powder waste to be distributed to the Batu Brick MSME center, so that MSMEs can benefit each other. Based on research, the use of sawdust as an alternative raw material presents an opportunity to improve the efficiency and sustainability of brick production. Sawdust, a by-product of the woodworking industry, can be combined with clay to make bricks that are more environmentally friendly and cost-effective. The integration of sawdust into the brick-making process not only reduces waste but also contributes to the development of a circular economy. The use of sawdust in brick production can provide several benefits, one of which is the reduction in the cost of raw materials, because sawdust is an available by-product and is relatively cheap. Improved thermal insulation properties, make bricks more energy-efficient and reduce the overall carbon footprint of the production process. (Khomah et al., 2021) (Putong, 2023) (Khomah et al., 2021)

Wood chips or sawdust in the study showed the feasibility and potential benefits of using sawdust in the manufacture of bricks. The inclusion of sawdust in the brick production process will improve thermal insulation properties, weight reduction, and lower energy consumption during the production process. This innovation is in line with the concept of sustainable development, as it promotes the efficient use of resources and waste reduction. In addition, the use of sawdust in brick production can contribute to the realization of the government's "One Village, One Product" program (Goel & Kalamdhad, 2017) , which aims to promote local economic development and the creation of unique community-based products. In addition to the innovative

use of sawdust, MSME brick manufacturers can also focus on improving their operational efficiency to ensure long-term sustainability. One key aspect of this is the integration of digital technology and tools to streamline various business functions, such as inventory management, production scheduling, and marketing.

The adoption of digital technology can not only improve operational efficiency but also enable MSME brick manufacturers to better understand market trends, respond to customer demands, and optimize their production processes. Additionally, collaboration and knowledge sharing among MSME brick manufacturers can encourage the development of best practices and the adoption of innovative techniques, which further improves efficiency and competitiveness. The use of alternative materials, such as sawdust, in the production of bricks has been the subject of extensive research. Studies have shown that the incorporation of paper mill sludge in brick manufacturing can lead to sustainable production practices, with potential commercial applications. Similarly, the use of pomegranate shell waste in brick production has been found to reduce annual energy consumption by up to 23.3% compared to traditional bricks. In addition, the synergistic effects of including rice husk, glass, and marble sludge in brick samples have been shown to improve physical, mechanical, and thermal properties, while reducing shrinkage and weight per unit area. The findings highlight the feasibility of utilizing waste materials in the brick industry, paving the way for more sustainable and innovative production methods. In addition, the use of recycled plastic waste in brick production has also been explored, with studies showing the potential to improve properties such as lightness and porosity, while also showing some challenges in maintaining optimal mechanical characteristics. (Abdel Hamid et al., 2023) (Abdel Hamid et al., 2023) (Chauhan et al., 2021)

It is hoped that Community Service Activities can contribute to MSME actors as activity partners to be able to develop and innovate and produce efficiently so that product profitability increases. In addition, it is hoped that the *One Village One Product* (OVOP) program can be realized and implemented so that it can become the flagship product of Sigedong Mancak Serang village.

Implementation Method

This Community Service is part of the main activity in the framework of the Student Work Lecture (KKM) Group 24 of Sultan Ageng Tirtayasa University in Sigedong Mancak Village, Serang Regency, Banten. To improve the quality and efficiency of brick production in Sigedong Village, innovations are made by adding wood powder to the production process. This innovation aims to produce bricks with better quality and a more efficient production process.

The implementation method in this activity is by providing counseling, mentoring and recommendations to MSME business actors in Brick Products and collaborating with Wood Producers, to utilize wood powder waste which will be used as materials used in burning Bricks. The following are the stages in the brick production process that have been renovated:

1. Ingredient Mixing:
    - Stages**:** The process begins with the addition of wood powder to the clay and water mixture.
    - Process: A mixture of clay, wood powder, and water is thoroughly mixed using a hoe tool. This mixing is done until the desired consistency is achieved, ensuring that the wood powder is evenly smeared.
2. Brick Printing:

- Stage: After the mixture is ready, the material is fed into the printing machine to form the bricks. The printing machine is designed to form bricks of consistent size and shape.
- Process: The printing machine works under a certain pressure to ensure the bricks have the ideal density. This molding process also ensures that each brick has the same dimensions, which is important for the strength and final quality of the product.

3. Drying:
   - Stage: The bricks that have been molded are then dried using sunlight. Drying is carried out for about three days, depending on the intensity of sunlight and weather conditions.
   - Process: Bricks are placed on an open area or shelf that allows exposure to direct sunlight. These drying aims to reduce the moisture in the bricks so that they are ready for the next process.
4. Broaching:
   - Stages: The blowing process is carried out after the bricks have dried to give them a red color and strengthen the brick structure. Blowing is done by burning bricks in an oven or furnace.
   - Process: The bricks are placed in a furnace heated at a high temperature for a day and a night. This process not only gives the brick its distinctive red color, but also increases the strength and durability of the brick against various environmental conditions.

This innovation of adding wood powder in the brick production process has proven successful. The resulting bricks have a neater surface, brighter colors, and better strength compared to previous products. In addition, the blowing process takes place faster, which significantly saves production time and costs.

Result and Discussion

The findings of this Community Service activity show that the incorporation of sawdust in brick production can lead to a significant increase in the sustainability and efficiency of MSME brick producers in Indonesia. The use of sawdust as a raw material has been shown to improve the thermal insulation properties of bricks, reduce their weight, and lower energy consumption during the production process. This innovation is in line with the principles of sustainable development, because it promotes the efficient use of resources and waste reduction, it is quite profitable for wood producers to utilize wood product waste in the form of wood dust that is usually discarded, into waste of economic value, because wood powder can be used for the brick production process.

Output:

1. High Quality Brick Production:
   With the application of wood powder addition innovation, the resulting bricks have better quality, including a neater surface and brighter colors.
2. Increased Production Efficiency:
   The production process becomes more efficient with faster blowing times and reduced production costs.
3. Process Documentation:
   Documentation that includes innovation procedures, mixing, printing, drying, and blowing techniques, as well as the results of the quality evaluation of the bricks produced.

Outcome:

1. Better Quality Bricks:
   These innovative bricks have higher durability, better aesthetic quality, and stronger structural strength, meeting higher market standards.
2. Increased Market Competitiveness:
   With improved product quality, Brick MSMEs in Sigedong Village can offer bricks that are more competitive in the market, increasing sales opportunities and market share.
3. Production Sustainability:
   These innovations support more sustainable production practices by utilizing environmentally friendly additives, such as wood pulp, which can reduce waste and the use of key raw materials.

Table 1. Product Innovation Follow-up Recommendation: Brick

Recommendations	Description
Adoption of Innovative Production Methods	Batubata MSMEs in Sigedong Village are advised to adopt an innovation method by adding 10% wood powder in the raw material mixture. This will result in stronger and higher quality bricks
Collaboration with Academics and the Government	It is hoped that there will be continued cooperation between MSMEs, academics, and village governments in conducting further research and development related to this innovation, as well as to ensure its sustainability and scalability.
Periodic Monitoring and Evaluation	It is recommended to conduct periodic monitoring and evaluation of the implementation of these innovations to ensure that the expected results are achieved and to identify areas that need improvement or adjustment.

Figure 1. Joint Activities with Brick MSMEs in Sigedong Mancak Village

Conclusion

The *One Village One Product* (OVOP) program implemented in Sigedong Village has succeeded in increasing innovation and efficiency in brick production by Small and Medium Enterprises (MSMEs). The use of wood powder as an alternative raw material has been proven to improve product quality, production process efficiency, and environmental sustainability. The results of the implementation of this program show that the bricks produced are not only better in terms of quality, but also more environmentally friendly, supporting sustainable production practices. To ensure the sustainability and success of this innovation, it is recommended that MSMEs continue to adopt innovative methods, collaborate with academics and the government, and conduct periodic monitoring of production processes and results.

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