From Waste To Wealth: Community Service For Sustainable Furniture Production

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Abstract

The PKM activity was carried out in Dalung, Badung, Bali. It adopts the use of reclaimed wood in furniture production. The background of this activity is that UMKM (Micro, Small, and Medium Enterprises) face an obstacle in their efforts to manage the cost of production and increase product quality. High dependence on new wood raises production costs, and as a result, it confines profitability. The program was designed to enhance the operational skills of UMKM operators to process reclaimed wood efficiently for lower cost production and high-quality final products.Participatory approaches were applied, followed by technical training sessions and direct production assistance. The beneficiary activities included identification of problems within a specific context, practical training in techniques for processing reclaimed wood, and managerial skills that aim to improve efficiency in resource use. The activities involved three main stages: socialization and problem identification, technical training, and tutoring during the course of production.The results were fairly impressive: the reduction of production costs by 25-30% due to the use of reclaimed wood, improvement of technical skills of participants, and enhanced product quality to meet local consumer standards. The program promoted active involvement in the community as well, because the participants expressed great interest in the application of the techniques learned. The overall outcomes of PKM helped not only to empower local UMKM but also to train people in sustainable practices within the production of furniture. Therefore, it placed an emphasis on the use of local resources and on continuous training as a stimulus for grass-roots economic growth.

Keywords: *Reclaimed Wood, Sustainable Furniture, Community Service, Skill Enhancement, Waste Management*

Introduction

Management in this respect signifies a science of making projects comply with their beginning estimates for time, cost, and quality (Komang Didi Kariana, 2024). (Putra, 2024) says that MSEs face several problems, which include shortage of capital, lack of human resources, less access to banking, uncertainty over the sustainability of the business, and other issues. The MSE sector is well placed, especially in the wood-processing industry, to determine the welfare of the local economy (Nurprabowo & Rahayu, 2023). However, entrepreneurs are faced by a number of problems, which include high production costs, the availability of raw materials being limited, and limited access to modern technology. Most MSEs depend on new wood, which is gradually becoming expensive due to the scarcity of the resource base. Where the wood waste or offcuts or reclaimed wood has not yet been used appropriately, while still it can be manufactured into quality items like cabinets or any other furniture.

Community economic development has always been an issue to better help people develop social and economic welfare improvements (Sedana, 2024). The major problems which the MSEs in wood processing face in the partner area involve several key elements. First, high production costs owing to limited access to affordable wood raw materials. With ever-increasing prices for new wood, it is difficult for most entrepreneurs to maintain their profit margins. Second, lack of technical abilities in utilizing reclaimed wood as an alternative source of raw material. Many entrepreneurs either do not know or do not have the skills

required in processing reclaimed wood or offcuts into quality products. Thirdly, low product innovation tends to result in the low competitiveness of MSEs within the local and national levels. Most MSEs tend to produce homogenous goods without creating higher value-added products, where, according to (Hutajulu & Islami, 2024), waste identification and reduction in production is necessary for enhancing operational efficiency and productivity.

Community service program PKM aims to optimize reclaimed wood as the main raw material in the manufacture of cabinets and other furniture products, with a general orientation toward basic economic principles of efficiency in the use of resources. In relation, the general objective of the program is to improve the technical capability and efficiency of production by wood processing MSEs, particularly in the use of reclaimed wood. It considers two important bases for the priorities of the program: first, the very high prices of raw materials are among the major obstacles facing MSEs, in line with what was iterated by (Hafsah, 2004), and, second, the potentials of reclaimed wood to be developed into value-added products competitive in the market, as revealed by (Royani, 2021). This issue is justified as a priority because of the dire need to advance cost reduction in production while at the same time increasing quality and assortment of the manufactured goods.

This program is underpinned by economic efficiency, underlined by minimal resource input with maximal results in return (Ismail, 2024). By this principle, wood processing MSEs are able to use reclaimed wood, cheaper than new wood, to make high-quality products. A theoretical basis of this program is the application of the concept of a circular economy, meaning all materials from obsolete products must be recycled and reused in the economic cycle (Masruroh & Fardian, 2022). It aims to facilitate refuse and/or leftover materials for reuse, to minimize waste and to keep the economic cycle running at a more sustainable pace (Darmastuti et al., 2021). Reclaimed wood utilization decreases wastes coming out of the industry and at the same time helps the entrepreneurs reduce raw material costs and increase their margins of profit accordingly.

On the other hand, from a community empowerment point of view, the theory that underlies this program is the theory of sustainable community development (Muh. Syainal Nur & Husen, 2022). The theory presses on the essence of enhancing the ability of people and capacities in order to develop better management of local resources. This program is expected to provide the community with new technical capabilities of managing wood waste into high-value products. The program also aligns with past community empowerment in skills training and local resource management that proved effective in improving the economic welfare of communities.

Other similar activities in the past have also included skills training in wood processing and the empowerment of MSEs to enhance the competitiveness of their products. The proposed program will be more innovative in the sense that it focuses on using reclaimed wood and applying circular economy principles, something not optimally utilized by MSEs in the partner area. Community service, therefore, shall focus on the reclaimed wood's maximum utilization as raw material to attain efficiency in production and thereby allow the local economy to enable creative value-added furniture products, like cabinets and other furniture made of wood. By targeting the economic efficiencies and capacity building within the community, the program shall try to open a larger opportunity for growth and uplifting the economic welfare of the community by local entrepreneurs.

Methods

This PKM is implemented in Dalung, Badung, Bali, one of the areas with the highest concentration of MSEs in wood processing. It will focus on enhancing the skill and competence of the craftsmen, utilizing reclaimed wood as raw material, and improving efficiency in the production process during the implementation of the two-month program. Methods applied in this PKM will be explained through the solutions offered, approaches used, and work procedures implemented.

1. Solution Offered and Implemented

The solution offered in this program uses reclaimed wood and wood offcuts as alternative raw materials in the furniture production process, especially for cabinets and similar products. The use of such materials is bound to solve the major problem the partners have been facing in high production costs due to dependence on new wood. Reclaimed wood will reduce the raw material cost for MSEs without necessarily compromising the quality of the products produced.

The solution will also accord the entrepreneurs technical training in efficient ways of processing reclaimed wood. In this process, the participants will be taken through the process of selecting, cutting, sanding, and assembling reclaimed wood into marketable products with high selling value. The program will also offer

simple business management training with a bias on financial planning and raw material management, thus enabling the partners to manage their resources with higher efficiency.

2. Approach Methods

A participatory approach amalgamated with a simple technology-based approach has been used in addressing the partners' problems. In this participatory approach, at every point, participation of entrepreneurs is ensured, implying involvement in identifying problems, formulating the solutions, and even assessing success. This will guarantee that the solutions offered meet the particular needs of the partners and can thus be applied in a sustainable way.

The approach will be based on the use of easy, uncomplicated methodologies and equipment in processing reclaimed wood, such as effective machinery for woodcutting and energy-saving sanding equipment. This is meant to enhance the use of the proposed solutions for long-term capital and technology-poor entrepreneurs. In the context of community empowerment, the methodology used involves several stages: (1) Program socialization, (2) Technical training and mentoring, and (3) Monitoring and evaluation. Each stage would be in close coordination with the local community to make sure that the result of the program is well adopted.

3. Working Procedures

The working procedure in this program is divided into several stages as follows:

Fig. 1 Flowchart Working Procedures

a) Socialization and Identification of Problems

The PKM team will, in the initial stage, socialize with MSE actors in Dalung regarding the goals and benefits of the program. This team also needs to identify specific problems faced by each of the partners, including the types of reclaimed wood available and the processing techniques they have mastered. This socialization will be carried out through group meetings involving local wood entrepreneurs.

b) Technical Training

The team then goes on with the technical training on techniques in the processing of reclaimed wood, use of simple tools, and methods of efficient cutting to produce quality furniture. Participants will be assisted to learn how to make an assessment for what type of reclaimed wood is suitable for use, how to repair wood defects, and advanced processing to enhance market value. This training will be done gradually, over a number of weeks, with field practical sessions.

c) Mentorship on Production

After training, the team provides direct mentoring throughout the production process. In other words, this direct mentoring is meant to ensure participants apply correctly whatever techniques they have learned. In this regard, each step of production will be guided from processing materials to assembling the final product. This will be done within the first two months after training.

d) Business Management and Savings on Raw Material

Apart from technical training, the partners will also undergo some simple business management training on how to manage the raw material stock, financial planning, and cost-saving in raw material usage. In the session, entrepreneurs learn how to reduce production waste as much as possible and make maximum use of every available piece of wood. Consequently, they can produce more products without raising their cost of production.

e) Monitoring and Evaluation

The monitoring shall be periodic to establish how the entrepreneurs are putting to work techniques taught. Evaluation after three and six months shall be done to ascertain how much of the savings in raw material costs shall have been achieved, and what quality products are being produced. The evaluation

shall also be on income increases generated by entrepreneurs after going through this program.

In this light, it is envisaged to trickle down and be felt in the impacts on wood processing MSEs within the Dalung area in efficiency in production, enhanced technical capacity, and increased business incomes.

Results and Discussion

1. Problem-Solving Outcomes for Partners Using Applied Methods

Due to the PKM program, maximizing use of reclaimed wood as the main raw material achieves a number of important results. First, production costs for partner MSEs in wood processing at Dalung, Badung, Bali are considerably reduced. Due to the usage of reclaimed wood, raw material costs decreased by about 25-30% and eased the pressure on sustaining profit margins without passing on the price increases to the product. Besides, their technical capabilities in treating the reclaimed wood also significantly improved. From the training provided, the partners can now distinguish types of reclaimed wood that are suitable for quality furniture production. The training also enhanced the partner's techniques of cutting, sanding, and assembling products more effectively.

Another valuable outcome of the program is the improvement in quality that has come about in the products made. Hitherto, entrepreneurs used to manufacture furniture of low standards because of their limited techniques and raw materials. However, after training, they were able to make cabinets and other furnishings of high quality which found very easy acceptance among the local consumers. These new products are not only more efficient in raw material use but also stronger and of finer quality, enabling MSEs to be more competitive in the local market.

Table 1. table summarizing the changes that occurred before and after the Community Service Program (PKM)

Aspect	Before PKM	After PKM
Production Costs	High dependence on new wood, leading to increased costs	Reduced costs by 25-30% through the use of reclaimed wood
Technical Skills	Limited skills in processing reclaimed wood	Enhanced skills in identifying and processing reclaimed wood
Product Quality	Lower quality furniture with minimal market appeal	Improved quality and aesthetics, better received by consumers
Community Participation	Low engagement in identifying problems and solutions	High involvement in all stages of the program
Product Output	Basic furniture production with low economic value	High-value furniture products made from reclaimed wood
Business Management	Lack of structured financial and resource management	Development of simple management plans for efficiency and profitability

2. Community Involvement in Program Implementation

The engagement of program partners in this current work has been very high. The stages involved in socialization to training and production mentoring involved all MSE actors. They helped highlight their major issues, including a lack of access to raw materials and skills problems related to processing reclaimed wood. They also showed great interest in the training and practical sessions as expressions of eagerness to enhance their skill and productivity levels. Partners have equally provided valuable feedback in the process of

implementation that helped the program team readjust the methods for better suitability to the needs on the ground.

In fact, this level of participation manifested not only in physical attendance during the activities but also in their commitment to implementing the techniques taught in daily production activities. In fact, even after the training ended, entrepreneurs were still in contact with the mentoring team to solve the problems that came up during the course of production. Through this very active involvement of entrepreneurs, success was achieved with the assurance of sustainability.

3. Types of Outputs Induced by the Program Activities

The program has produced different valuable outputs. To begin with, there are physical outputs in the forms of furniture products that include cabinets, tables, and chairs using varieties of reclaimed wood with new methods of processing. Besides eliciting higher economic values, such products manifest increased technical capacities of entrepreneurs. Besides, the enhancement of technical skills is an essential output. Where previously considered wastes, through training and mentoring, entrepreneurs can now process raw materials into high market value products.

The other output or deliverable of the program is the reporting of basic business management plans implemented by MSE partners. These encompass raw material management, financial management, and production planning to ensure efficiency and profitability. The program also produced a model for empowerment drawn from leveraging on local resources that can easily be replicated by other MSEs in the same geographical area.

4. Implications for Follow-Up Actions, Impacts, Learnings, and Program Development

This PKM program can be further developed by involving more MSE actors in the surrounding Dalung area, Badung, Bali. The implications of the success of this program include opportunities to expand training and mentoring outreach to wood processing MSEs in other areas facing similar challenges. The empowerment model based on utilizing reclaimed wood can also be applied to other sectors facing similar raw material challenges, such as crafts and construction industries.

Probably the most apparent impacts of this program are increased efficiency and cost savings in production for entrepreneurs. The use of reclaimed wood means that the dependence on new wood, whose prices fluctuate and continuously rise, is no longer at 100%. In addition to these economic impacts, positive environmental impacts come through the promotion of reduction of wood waste and the reuse of existing resources.

Another vital lesson that can be learned from the initiative is the fact that MSE partners should be actively involved in each step of the process. This can ensure high levels of participation whereby the methods used are more efficient and appropriate. The application of simple technologies that correspond to the capacities of MSE partners has also been considered an adequate strategy for community empowerment.

In the future, the program could be developed further by incorporating product marketing and distribution aspects to help MSE actors increase their market share. Besides, the new innovations in furniture design could be incorporated within the programs to make the products more attractive to wider markets.

Figure 1. Furniture Innovation: Products Made from Reclaimed Wood

Conclusion

A PKM program dealing with reclaimed wood for furniture production had been carried out and was able to create significant positive impacts on the MSME actors in Dalung, Badung, Bali. The partners were able to reduce the cost of production, improve the quality of the product, and develop technical skills on how to process reclaimed woods effectively through a participatory approach and effective technical training. The program has also ensured good business management and full participation of the community at all levels of its implementation, hence making it stronger in the local market. This success underlines the importance of innovation anchored on local resources and constant training for stimulating sustainable economic development at the community level.

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