



## Empowering Women Farmers Tirta Rahayu through Cost of Goods Sold (COGS) Training on Creative Processed Agricultural Products Based on Science and Technology

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### ABSTRACT

*The community service partner is the Tirta Rahayu Women Farmers Group (KWT) located in Tamanan Village, Banguntapan District, Bantul Regency. This group is engaged in the processing of local agricultural products. The main problem faced is the low level of understanding among members regarding how to calculate the Cost of Goods Sold (COGS). This results in inaccurate pricing and inconsistency in profits, meaning that the potential of their business has not been optimally exploited. The empowerment program implemented focuses on training in technology and the use of digital cost analysis tools, particularly spreadsheet applications, to calculate COGS. Through socialization, workshops, and mentoring, there was a 45% increase in members' knowledge of COGS and a 17% increase in production efficiency. As a result, KWT Tirta Rahayu is now able to determine fairer selling prices, optimize resource utilization, and increase the competitiveness of their products in the local market.*

### Keywords

Community Service  
Agricultural Product  
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### A. INTRODUCTION

Indonesia is blessed with abundant natural resources, fertile soil, and a tropical climate (Maliyah, 2022). However, a paradox emerges when the majority of the population remains in the lower-middle economic class, where poverty arises as a consequence of a development model that pursues economic growth but neglects human rights principles, thereby deepening social inequality (Dekki Umamur Ra's, 2017). Data from the Central Statistics



Agency (2023) shows that the contribution of the agricultural sector to the national GDP has shrunk to 13% in line with the rapid growth of the industrial and service sectors (Badan Pusat Statistik, 2023). Nevertheless, the significance of the agricultural sector remains irreplaceable, especially in terms of employment, which accounts for 29% of the total national workforce (Badan Pusat Statistik, 2025; Badan Pusat Statistik, 2024). The reality behind these figures shows that most jobs in the agricultural sector are still subsistence-based with relatively lower income levels compared to the modern economic sector. In this context, MSMEs play a crucial role with their ability to absorb labor and distribute income more evenly (Yulya Ammi Hapsari et al., 2024). However, MSMEs face complex challenges, particularly limited financial management capacity due to low financial literacy (Harnida et al., 2024), which is evident in the suboptimal calculation and recording of production costs. The productivity gap between the agricultural and industrial sectors has created significant income inequality (Todaro, 2020). Comparative studies in India and Vietnam show that agricultural modernization can reduce this gap, although structural challenges still need to be addressed (Ekaina, 2019).

The transformation of traditional agricultural systems towards more modern practices is a crucial step in narrowing the inequality gap, while also opening up wider opportunities for women's participation in the agricultural sector. In this context, the role of women has undergone a significant transformation from merely supplementing their husbands' income (Fatmawati, 2018) to becoming active and strategic actors in meeting family needs and contributing directly to the process of agricultural modernization. They have become active actors in meeting family needs (Prasekti et al., n.d.). Increased productivity among women farmers has the potential to significantly boost agricultural household income (Yoga Tri Ambudi, 2023). The existence of women farmer groups (KWT) such as Tirta Rahayu in Bantul proves the potential for empowering women farmers through capacity building (Sukmasari, 2020), with the aim of creating independence and equal participation in decision-making (Noshaba Aziz, 2021; Nur Isna Deraputri et al., n.d.). Community empowerment as an alternative development model (Machmudah et al., 2019) plays a crucial role in realizing a strong and sustainable farmer organization (Edy Mulyono et al., 2016).

Unfortunately, the potential of KWT Tirta Rahayu is hampered by weak cost management capabilities, where the determination of selling prices still relies on estimates rather than comprehensive cost calculations. The belief in pricing based on "feelings" without considering all cost components has an impact on unstable income and weakens competitiveness. Therefore, science and technology-based interventions to strengthen financial literacy and COGS calculation capabilities are urgently needed. Digital assistance has been proven to improve the accuracy of cost recording, selling price accuracy, and operational efficiency (Mariza Syafitri et al., n.d.). The ability to calculate COGS correctly increases the competitiveness of processed products, especially when consumers are increasingly selective in choosing businesses that offer competitively priced products, high quality, and services that meet their needs (Satriani & Vijaya Kusuma, 2020).

## **B. METHODS**

Methods. This community service activity employed a participatory and practice-oriented educational approach aimed at community empowerment through the direct transfer of knowledge and practical skills. The approach was selected to support the enhancement of micro-enterprise literacy and managerial capacity. The activity partnered with KWT Tirta Rahayu, chosen for its active participation, strong potential for business development, and readiness to improve organizational capacity. The training focused specifically on calculating



and managing the Cost of Production (COP/COGS) as a fundamental tool for efficient pricing and sustainable business decision-making.

**Implementation Stages.** The program was implemented in three stages: (1) preparation and needs assessment through field observations and preliminary interviews with KWT Tirta Rahayu administrators; (2) outreach and training on Cost of Production using interactive lectures, focus group discussions (FGDs), and hands-on calculation simulations based on members' business cases; and (3) evaluation and follow-up to assess participants' understanding and application of the material. The activities were conducted over one month, aligned with the group's routine schedule, and supported by visual media and simplified modules to accommodate participants with diverse educational backgrounds.

### **C. RESULTS AND DISCUSSION**

The community service activity implemented with the Tirta Rahayu Women Farmers Group produced significant outcomes in enhancing members' business capacity. Through a participatory and practice-oriented educational approach, members gained a clearer understanding of Cost of Production (COP/COGS) concepts. Evaluation results indicated a 45% increase in COP knowledge, demonstrating the effectiveness of interactive socialization and hands-on learning methods.

Beyond knowledge improvement, the systematic application of COP calculations had a direct impact on production efficiency. Members were able to identify cost components more accurately, resulting in a 17% reduction in production costs. This finding confirms that simulation-based training and business case practices effectively strengthened practical cost management skills.

The adoption of digital templates using Excel and Google Sheets also led to meaningful changes in business decision-making. All members (100%) successfully applied digital templates for COP calculations, contributing to more accurate and fair pricing strategies as well as more equitable profit distribution. This outcome reflects a behavioral shift from intuition-based practices to data-driven decision-making.

In the long term, these results contribute to greater financial independence among women farmers and improved competitiveness of processed agricultural products in local markets. The low-cost, simple, and replicable training model offers strong potential for adoption by other women farmer groups in Bantul Regency and the Special Region of Yogyakarta. The level of implementation difficulty is considered low to moderate, while future development opportunities are substantial, ranging from e-commerce integration and halal certification to modern packaging and large-scale program replication. Overall, this community service activity has demonstrated a sustainable impact on individuals, groups, and the local economy of Tamanan Village.



Figure 1. Presentation of material



Figure 2. Question and answer session

#### D. CONCLUSION

The spreadsheet-based training on calculating the Cost of Goods Produced (COGS) implemented in the Tirta Rahayu Women Farmers Group has yielded concrete and sustainable results. Quantitatively, this program has succeeded in increasing members' understanding of COGS by 45% and production efficiency by 17%, while qualitatively there has been a behavioral transformation from emotion-based pricing to a data-driven approach. The program's strengths lie in its technological simplicity, requiring only a smartphone and a free spreadsheet application, making it highly applicable for agricultural MSMEs with limited literacy, as well as its immediate economic impact through more accurate pricing and equitable profit distribution. However, the program has limitations in terms of its dependence on internet access and digital devices, and it does not yet include advanced training in digital marketing. Looking ahead, there are significant opportunities for development through ecommerce integration, halal certification, packaging innovation, and, most importantly, replicating the program to dozens of other women farmer groups in the DIY region. Thus, this program has not only succeeded in creating direct economic impact but has also laid a strong foundation for more sustainable and measurable agricultural SME development in the future.

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## **F. AUTHOR CONTRIBUTIONS**

The success of the community service activity "Members of the Tirta Rahayu Women Farmers Group through Strengthening Creative Processed Agricultural Products Based on Science and Technology" and the writing of this scientific article is the result of collaboration between all team members. Each author has a complementary role in the planning, implementation, evaluation, and preparation of scientific reports.

**Beta Asteria (Team Leader)** As team leader, Beta Asteria led the entire program planning process, from identifying problem partners to empowering computing strategies focused on improving understanding of Cost of Goods Produced (COGS) calculations. She ensured that activities ran according to plan, led coordination with KWT Tirta Rahayu, and was responsible for compiling the introduction and conceptual framework of the article. Her leadership ensures that all activities and results are organized systematically.

**Sulastiningsih (Member 1)** Sulastiningsih plays a role in preparing training materials on the basic principles of production cost calculation and selling price determination. She also facilitates socialization activities and conducts manual Cost of Goods Produced (COGS) calculation practices, helping participants understand cost components and observing changes in participants' abilities during the activities. In addition, she contributed to the preparation of the methodology section and reviewed the quality of the article's content.

**Muhammad Subkhan (Member 2)** Muhammad Subkhan was responsible for collecting and analyzing activity data, including assessing the improvement in KWT members' skills in calculating Cost of Goods Produced (COGS) and production efficiency. He conducted direct observations, interviews, and impact analyses that showed a 45% increase in participants' understanding. Subkhan also compiled the results and discussion sections of the article so that the findings could be presented clearly and validly.

**Rafif Raditya Muhrizal (Member 3)** Rafif contributed to technical assistance and field documentation, as well as preparing documents to support the report. He was also involved in writing the article and contributed to the preparation of the results and conclusions sections, as well as helping to ensure that the article complied with journal guidelines.

**Dimas Rizky Kurniawan (Member 4)** Dimas participated in supporting the implementation of activities by organizing educational tools and assisting participants during training sessions. He was also involved in compiling the results narrative and presenting evidence of activities, including strengthening the argument that showed a change in participants' behavior from estimating prices based on estimates to setting prices based on actual cost data. Through the synergy of all team members, this community service activity successfully had a significant impact on improving production cost literacy for KWT Tirta Rahayu and produced a comprehensive scientific report with academic value.

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