

## EMPOWERING COFFEE FARMER GROUPS THROUGH POST-HARVEST STANDARDIZATION, BUSINESS MANAGEMENT, AND TECHNOLOGY TRANSFER IN BELANTIH VILLAGE, KINTAMANI

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### Abstract

Belantih Village, Kintamani District, Bangli Regency, has strong potential for coffee-based local economic development, yet the Karsa Nadi and Sarwa Ada Coffee Farmer Groups still face constraints in post-harvest processing, quality standardization, business administration, and market development. This community service program under the Pemberdayaan Mitra Usaha Produk Unggulan Daerah (PM-UPUD) scheme aimed to strengthen the technical and managerial capacity of the two farmer groups as a foundation for developing competitive and sustainable coffee enterprises. The first-year program applied a participatory approach involving lecturers, students, village government representatives, group administrators, and farmer members. Activities were organized into five stages: coordination and problem identification; training and extension; technology application and mentoring; monitoring and evaluation; and sustainability planning. Technical assistance covered selective red-cherry harvesting, sorting, fermentation, washing, drying, storage, hygiene and quality control, and the introduction of a Standard Operating Procedure (SOP) for coffee processing. Managerial assistance included simple financial recording, production-cost administration, sales records, and group business administration. The implementation produced several initial changes. Participants showed better understanding of post-harvest handling and product quality, the processing SOP began to be used as a common operational reference, simple business records were introduced, participation in program activities became more coordinated, and periodic technical mentoring was established. Knowledge and technology transfer was reinforced through demonstrations, field practice, discussion, and direct assistance rather than one-way training alone. The progress report does not provide quantified pre-test/post-test scores, income changes, or production increases; therefore, the outcomes are interpreted as descriptive capacity and practice improvements rather than final economic impacts. The program establishes a practical foundation for the next phase, which should strengthen consistent SOP implementation, production capacity, quality control, branding, packaging, digital promotion, market networking, and farmer-group institutions.

### Keywords:

coffee farmer groups, post-harvest processing, standard operating procedures, business management, technology transfer, community empowerment

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## INTRODUCTION

Coffee is an important agricultural commodity for rural economies because its value is determined not only by production volume but also by the quality of cultivation, post-harvest handling, processing consistency, and the position of farmers within the value chain. National technical guidance emphasizes the importance of good agricultural practices, while coffee-processing guidelines highlight selective harvesting, hygiene, drying, storage, and quality control as critical stages in protecting product quality (Ministry of Agriculture of the Republic of Indonesia, 2020; International Coffee Organization, 2021; Food and Agriculture Organization of the United Nations, 2019). Improving these stages can increase value addition and create a stronger basis for market differentiation, particularly when farmer groups are able to combine technical improvements with better business management (Nugraha & Suharno, 2020; Porter, 2008).

Belantih Village, Kintamani District, Bangli Regency, is one of the local coffee-producing areas with considerable potential to support the development of a regional superior product. The village lies at

approximately 1,100-1,300 meters above sea level, and its agroclimatic conditions support coffee cultivation. Coffee farming is an important source of income for the local community, making the commodity strategically relevant to village economic development. This local potential is consistent with broader rural-development approaches that encourage communities to strengthen value chains around locally distinctive products and productive institutions (Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, 2021; World Bank, 2020).

Despite this potential, the Karsa Nadi and Sarwa Ada Coffee Farmer Groups still experienced several constraints that limited value creation at the farmer level. Field observations and discussions indicated that post-harvest handling continued to rely on relatively simple facilities and that sorting, fermentation, washing, drying, and storage were not consistently standardized. The absence of an operationally applied SOP created the risk of variation in processing practices and product quality. Standardization is particularly important because coffee quality can be affected by handling at each stage of the post-harvest chain, including cleanliness, moisture management, storage, and the control of defective beans (Widyotomo, 2019; National Standardization Agency of Indonesia, 2020).

The farmer groups also faced managerial limitations. Business administration and financial recording were not yet systematically organized, and records of production costs, income, expenditure, sales, and cash flows were limited. This condition reduced the ability of the groups to evaluate their business performance, formulate development plans, and prepare credible information for financing or partnership opportunities. Strengthening farmer institutions and simple business administration is therefore important because collective organizations require transparent records, task coordination, and basic managerial capacity to improve their bargaining position and sustainability (Suryana & Kariyasa, 2018; Tambunan, 2019).

Marketing represented another development gap. A large proportion of the product was still marketed through collectors, while product identity, packaging, digital promotion, and wider direct-market access had not been optimized. However, expanding promotion before achieving more consistent quality can create a mismatch between market promises and production readiness. For this reason, the first year of the PM-UPUD program placed priority on strengthening the technical and managerial foundations of the farmer groups, while branding, digital marketing, network expansion, and production scaling were positioned as subsequent development priorities.

The PM-UPUD community service program was therefore designed as a staged empowerment process rather than a single training activity. The first-year intervention focused on improving post-harvest capability, introducing a practical processing SOP, strengthening simple business administration, and establishing a mentoring mechanism. The activities also involved university students as part of experiential community engagement, linking academic learning with the application of knowledge in a real rural-enterprise context. This article summarizes the first-year implementation, initial outcomes, implementation constraints, and sustainability direction of the empowerment program for the Karsa Nadi and Sarwa Ada Coffee Farmer Groups in Belantih Village.

## METHODS

**Program Setting and Partners.** The community service program was implemented in Belantih Village, Kintamani District, Bangli Regency, Bali, with the Karsa Nadi Coffee Farmer Group and the Sarwa Ada Coffee Farmer Group as the main partners. The program involved lecturers from Warmadewa University, students from the Development Economics Study Program, village government representatives, group administrators, and farmer-group members. The intervention was conducted as the first-year stage of the PM-UPUD scheme and was directed toward strengthening production-related capability and basic business management.

**Participatory Implementation Approach.** The program used a participatory approach combining socialization, training, demonstration, field practice, mentoring, monitoring, and evaluation. The approach was selected so that partners were not positioned only as recipients of information, but

were involved in identifying problems, determining priorities, practicing introduced procedures, discussing operational constraints, and evaluating implementation. This type of applied community engagement is consistent with the program objective of transferring knowledge and technology in a form that can be adopted by the partner groups and sustained after the formal activity period.

**Five Implementation Stages.** The activities were organized into five interconnected stages. First, the team coordinated with the village government and farmer-group administrators, conducted socialization, observed field conditions, and identified priority problems. Second, training and extension were delivered on selective red-cherry harvesting, sorting, fermentation, washing, standardized drying, storage, hygiene and quality control, SOP implementation, simple financial recording, production-cost management, and group administration. Third, the team conducted direct mentoring to support the application of post-harvest procedures and the preparation of simple business records. Fourth, monitoring and evaluation were conducted through field observations, interviews, group discussions, review of participant understanding, assessment of SOP application, and review of administrative practices. Fifth, sustainability planning was prepared through continued mentoring, refinement of the SOP, institutional strengthening, improved business administration, stakeholder coordination, and preparation for the subsequent program stage.

**Evaluation and Interpretation of Outcomes.** The progress report primarily documents implementation processes and descriptive changes rather than experimental or statistical impact measures. Accordingly, this article compares initial partner conditions with first-year implementation outcomes using field observations, monitoring results, participant engagement, adoption of the SOP, and changes in administrative practices. No numerical pre-test and post-test scores, quantified income changes, production-volume increases, or product-price changes were reported in the source document. Therefore, the results are presented as early-stage improvements in capacity, procedures, and organizational practice, and are not interpreted as quantified causal impacts. This descriptive interpretation is consistent with the available evidence and avoids overstating program effectiveness.

## RESULT AND DISCUSSION

**Baseline Conditions and Priority Problems.** The initial assessment showed that the partner groups possessed important assets for development, including local coffee-production experience, available agricultural resources, and a strong connection between coffee and household livelihoods. At the same time, the groups faced interconnected problems in production, management, marketing, and institutional organization. Post-harvest activities were carried out with limited facilities, while sorting, fermentation, washing, drying, and storage were not consistently performed according to a common quality standard. The lack of standardized procedures contributed to variability in processing practices and reduced the groups ability to guarantee consistent product quality. In managerial terms, transaction records and cost calculations were still limited, making it difficult to evaluate business performance or prepare development plans. Marketing remained dependent on collectors, and the groups had not yet fully developed product identity, attractive packaging, or digital promotion. Based on these conditions, the program prioritized post-harvest standardization and business administration as the first-year foundation for later marketing and production expansion.

**Coordination, Socialization, and Partner Commitment.** Implementation began with coordination among the community service team, the Belantih Village Government, the Karsa Nadi Coffee Farmer Group, and the Sarwa Ada Coffee Farmer Group. This stage was important for aligning expectations regarding program objectives, activity schedules, the role of each party, mentoring mechanisms, and expected outputs. Socialization also created a shared understanding that improving coffee competitiveness requires more than increasing production; it requires consistent processing, quality control, administrative discipline, and collective commitment. The progress report records strong participation and a positive response from the partner groups throughout the scheduled

activities. Such participation became an important enabling factor because the introduced procedures could be discussed and practiced directly with those responsible for day-to-day coffee processing.

**Post-Harvest Training and Quality Awareness.** The technical training was designed to move participants from experience-based post-harvest practices toward more structured processing. Materials included selective harvesting of mature red cherries, sorting, fermentation, washing, drying, storage, cleanliness control, and quality assurance. Training was not limited to lectures; it combined interactive discussion, demonstration, and direct practice so that participants could understand the function of each processing stage. The emphasis on selective harvesting and standardized handling is consistent with coffee-processing guidance that links raw-material quality and process control to final product characteristics (International Coffee Organization, 2021; Widyotomo, 2019). During implementation, participants demonstrated greater awareness that product quality must be managed from harvesting through storage rather than inspected only at the end of the process.

**Development and Initial Application of the Coffee-Processing SOP.** A key output of the first-year program was the introduction of a Standard Operating Procedure adapted to the actual conditions of the farmer groups. The SOP covered mature-cherry harvesting, fruit sorting, fermentation, washing, drying to an appropriate moisture condition, storage, and hygiene control during processing. The purpose of the SOP was to provide a common operational reference so that members could reduce differences in processing practices and gradually build more consistent quality. This standardization is relevant to national coffee quality requirements and good hygiene practices along the coffee chain (National Standardization Agency of Indonesia, 2020; Food and Agriculture Organization of the United Nations, 2019). Monitoring showed that the SOP began to be applied in processing activities. Nevertheless, the source report also recognizes that consistent implementation by all members requires continued supervision and repetition until the procedures become routine working practices.

**Strengthening Business Administration and Financial Recording.** Technical improvements were accompanied by basic business-management assistance. The groups were introduced to simple administration covering transaction records, production costs, sales, cash movements, and basic business reporting. The objective was not to establish a complex accounting system, but to create reliable records that could support evaluation, planning, accountability, and future access to financing or partnerships. Before the program, administration was described as unstructured and many transactions had not been systematically documented. During the first year, simple business records began to be introduced and group administrators showed better understanding of the role of data in business decision-making. For farmer organizations, this managerial foundation is important because stronger administration can support collective planning and reduce dependence on informal memory-based management (Suryana & Kariyasa, 2018; Tambunan, 2019).

**Knowledge and Technology Transfer.** The program treated technology delivery as a process of knowledge transfer and practical adoption rather than the distribution of equipment alone. Participants received explanations, observed demonstrations, practiced post-harvest procedures, discussed problems encountered in the field, and obtained periodic mentoring. This sequence allowed the team to connect technical concepts with the actual conditions of the groups. The approach also enabled immediate feedback when participants faced difficulties in implementing sorting, fermentation, drying, storage, or administrative procedures. Students contributed to field facilitation, documentation, administrative assistance, monitoring, and evaluation. Their involvement strengthened the intensity of interaction with the partner groups and supported the broader objective of experiential learning through community engagement.

**Initial Program Outcomes.** The first-year outcomes indicate a shift in several operational conditions, although the results remain at an early stage. Participant understanding of post-harvest practices improved through training and direct practice; an operational SOP that had previously not been available began to be introduced and implemented; simple business-administration records started to be used; member participation became more active and coordinated during program

activities; and periodic technical mentoring was established. These changes are important because they create the internal capacity required before the groups can realistically pursue higher production, broader promotion, or more demanding markets. The outcomes are summarized in Table 1.

**Table 1. Initial Conditions and First-Year Program Outcomes**

| Indicator               | Initial Condition          | First-Year Outcome                                  |
|-------------------------|----------------------------|-----------------------------------------------------|
| Post-harvest knowledge  | Limited                    | Improved through training and practice              |
| Quality SOP             | Not yet available/applied  | SOP introduced and implementation initiated         |
| Business administration | Unstructured               | Simple administrative records introduced            |
| Member participation    | Not well coordinated       | Members actively participated in program activities |
| Technical mentoring     | Not previously implemented | Periodic mentoring conducted by the service team    |

Source: First-year PM-UPUD progress report, summarized by the authors.

**Results of Technology and Innovation Delivery.** The progress report also documents the specific forms of technology and innovation delivery during the first year. Post-harvest techniques were delivered through training and practice, the processing SOP through implementation mentoring, business administration through training and assistance, quality management through demonstration and evaluation, and continued mentoring through field monitoring. The initial results were increased participant understanding, the beginning of SOP application, the introduction of business records, stronger quality awareness, and improved group commitment. These outputs are summarized in Table 2 and demonstrate that the program combined technical, managerial, and organizational elements rather than treating each area separately.

**Table 2. Technology and Innovation Delivery During the First Year**

| Technology/Innovation   | Delivery Method              | Initial Result                        |
|-------------------------|------------------------------|---------------------------------------|
| Post-harvest techniques | Training and field practice  | Participant understanding improved    |
| Coffee-processing SOP   | Implementation mentoring     | SOP application initiated             |
| Business administration | Training and mentoring       | Simple business recording initiated   |
| Quality management      | Demonstration and evaluation | Awareness of product quality improved |
| Continued mentoring     | Field monitoring             | Group commitment strengthened         |

Source: First-year PM-UPUD progress report, summarized by the authors.

**Supporting Factors and Implementation Constraints.** Several factors supported implementation, including the commitment of the village government, active participation of farmer-group members, institutional support from Warmadewa University, and student involvement in field activities. These factors helped the program maintain coordination and adapt activities to local conditions. The program also encountered practical constraints. Activity schedules had to be adjusted to the coffee-harvest season and to the time availability of farmers who continued to work in their plantations. In addition, the adoption of new procedures required repeated mentoring because knowledge gained during training does not automatically become consistent daily practice. These constraints did not prevent first-year activities from being implemented, but they reinforce the need for a multi-stage empowerment model rather than short-term training alone.

**Sustainability, Marketing, and Institutional Development.** The next phase of the program is planned to consolidate the technical and managerial foundation established during the first year. Priority activities include improving consistency in SOP implementation, optimizing post-harvest facilities, strengthening quality control, increasing production capacity, improving business administration, and strengthening the organizational capacity of the farmer groups. Once product quality becomes more consistent, market-development activities can be expanded through branding, packaging improvement, digital promotion, and the development of networks with business actors,

cooperatives, MSMEs, coffee shops, and other potential partners. This sequence is strategically important because competitiveness requires an alignment between product quality, organizational capability, and market positioning (Porter, 2008; World Bank, 2020).

**Contribution to Community Empowerment and University Engagement.** Beyond the immediate technical outcomes, the program strengthened collaboration among the university, village government, farmer groups, and students. The farmer groups received structured assistance to address practical business problems, while students gained direct experience in problem identification, community communication, facilitation, documentation, monitoring, and program evaluation. The activity therefore contributed to the implementation of university community-service responsibilities and provided a contextual learning environment in which academic knowledge was connected with local economic development. The collaboration also creates an institutional basis for continued mentoring, research, and innovation related to the development of coffee as a local superior product.

## CONCLUSION

The first-year PM-UPUD program in Belantih Village successfully established a stronger technical and managerial foundation for the Karsa Nadi and Sarwa Ada Coffee Farmer Groups. Through a participatory sequence of coordination, socialization, training, demonstration, field practice, mentoring, monitoring, and evaluation, the program addressed two central constraints: inconsistent post-harvest processing and weak business administration. Participants developed better understanding of coffee post-harvest handling and quality control, a processing SOP was introduced and began to be applied, simple business and financial records were initiated, member participation became more coordinated, and periodic technical mentoring was established. The program also strengthened knowledge and technology transfer by linking technical instruction with direct practice and follow-up assistance.

The reported outcomes should be interpreted as early-stage capacity and practice improvements rather than final economic impacts because the source report does not provide quantified changes in income, production volume, sales value, or pre-test/post-test scores. Continued mentoring is therefore necessary to turn the initial changes into consistent organizational routines. The next phase should focus on strengthening SOP compliance, production efficiency and capacity, quality consistency, business administration, institutional governance, branding, packaging, digital marketing, and market partnerships. If these elements are developed sequentially and supported by continued collaboration among farmer groups, the village government, the university, students, and market actors, the program has the potential to strengthen the competitiveness and sustainability of coffee-based local enterprises in Belantih Village.

## REFERENCES

- Badan Standardisasi Nasional. (2020). SNI 01-2907-2020: Kopi. Jakarta: BSN.
- Direktorat Jenderal Perkebunan. (2024). Statistik Perkebunan Indonesia: Kopi 2022-2024. Jakarta: Kementerian Pertanian Republik Indonesia.
- Food and Agriculture Organization of the United Nations. (2019). Good hygiene practices along the coffee chain. Rome: FAO.
- International Coffee Organization. (2021). Coffee processing and quality improvement guidelines. London: ICO.
- Kementerian Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi. (2021). Pengembangan Produk Unggulan Kawasan Perdesaan (Prukades). Jakarta: Kemendes PDTT.
- Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2023). Panduan Program Kemitraan Masyarakat (PKM). Jakarta: Kemendikbudristek.
- Kementerian Pertanian Republik Indonesia. (2020). Pedoman teknis budidaya kopi yang baik (Good Agricultural Practices/GAP). Jakarta: Direktorat Jenderal Perkebunan.
- Murthy, P. S., & Naidu, M. M. (2012). Sustainable management of coffee industry by-products and value addition: A review. *Resources, Conservation and Recycling*, 66, 45-58.
- Nugraha, A., & Suharno. (2020). Analisis nilai tambah pengolahan kopi rakyat. *Jurnal Agro Ekonomi*, 38(2), 95-108.

- Porter, M. E. (2008). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
- Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.
- Suryana, A., & Kariyasa, K. (2018). Pemberdayaan petani dan penguatan kelembagaan ekonomi perdesaan. *Forum Penelitian Agro Ekonomi*, 36(1), 1-15.
- Tambunan, T. (2019). *Usaha mikro kecil dan menengah di Indonesia: Isu-isu penting*. Jakarta: LP3ES.
- Widyotomo, S. (2019). *Teknologi pascapanen kopi*. Jember: Pusat Penelitian Kopi dan Kakao Indonesia.
- World Bank. (2020). *Enhancing agricultural value chains for rural development*. Washington, DC: World Bank.