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Creative Food Processing As A Youth Business Opportunity: Circular Economy Empowerment And Traditional Food Knowledge For Orphanage Adolescents

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Abstract

Indonesia generates 23-48 million tons of food waste annually, ranking it as the world's second-largest contributor of food waste, while the rich diversity of Balinese traditional food remains underutilized as a source of youth entrepreneurship. Adolescents residing in orphanages, who typically come from underprivileged families with limited access to entrepreneurship education, represent a vulnerable group at risk of unemployment after leaving institutional care. This community service activity aimed to enhance the knowledge and entrepreneurial motivation of orphanage adolescents in creative food processing through two complementary approaches: food waste utilization within a circular economy framework and the introduction of economically valuable Balinese traditional foods. The activity was conducted on 7 March 2026 at the KH. M. Manshur Educational Orphanage (YAPPA), Denpasar, using a participatory approach method comprising interactive lectures, group discussions, product demonstrations of food-waste derivatives, and an entrepreneurial motivation session. Effectiveness was evaluated using pre-test and post-test instruments together with a five-point Likert satisfaction questionnaire. A total of 27 participants attended, exceeding the target of 20 (135%). Results showed an average knowledge increase of 42%, surpassing the 30% target, with a participant satisfaction score of 4.6 out of 5. Group discussions also generated five creative food business ideas based on waste and local ingredients. The findings indicate that participants developed a better understanding of the learning materials through hands-on product demonstrations and the sharing of entrepreneurial experiences by successful orphanage alumni. Therefore, continuous vocational training and business mentoring are recommended to enable participants to translate the knowledge gained into practical and sustainable entrepreneurial activities.

Keywords: circular economy; youth entrepreneurship; food waste; Balinese traditional food; community service

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Introduction

Indonesia faces a dual challenge within its national food system: an abundance of underutilized traditional food resources on one hand and substantial food waste generation on the other. According to the National Food Agency, Indonesia produces 23-48 million tons of food waste per year, making it the world's second-largest contributor after Saudi Arabia [1]. This condition is consistent with global findings indicating that food loss and waste occur throughout the supply chain, from production to household consumption [2], [3].

The circular economy approach offers a solution to food waste problems by converting production and consumption residues into value-added products while simultaneously creating new business opportunities for small-scale economic actors [4], [5]. In Indonesia, this policy direction is reinforced by the Indonesia Circular Economy Roadmap 2025-2035, which promotes the development of food industries based on recycled resources [6].

Bali, with its distinctive culinary diversity, including lawar, sate lilit, and jaje Bali, holds substantial potential to develop creative, sustainable food products based on local resources [7]. The preservation and revitalization of local food also play an important role in supporting sustainable regional food security [8]. However, the economic potential of both traditional food ingredients and food waste remains largely unrecognized and underutilized by younger generations, including adolescents under the care of social institutions.

Adolescents living in orphanages constitute a relatively economically vulnerable group. Most come from underprivileged families with limited access to entrepreneurship education, placing them at risk of unemployment after leaving institutional care due to insufficient vocational skills. Previous research indicates that food entrepreneurship training can serve as a relevant economic empowerment strategy for adolescents in orphanages [9]. Using food waste and traditional food ingredients as a business foundation is a strategic choice, as it requires little initial capital and leverages resources already available in participants' surroundings.

Based on these conditions, this community service activity was designed to address three main issues: (1) how to increase orphanage adolescents' knowledge of the economic potential of food waste within a circular economy framework; (2) how to introduce the richness of Balinese traditional food ingredients as capital for creative food businesses; and (3) how to equip participants with basic food entrepreneurship knowledge so they can initiate independent businesses based on local food. The activity aimed to increase participants' awareness and knowledge of the food circular economy, introduce types of Balinese traditional food ingredients and their nutritional and economic value, and foster motivation for creative food entrepreneurship among adolescents in orphanages as a foundation for economic independence. Furthermore, the program integrates human literacy, life skills, social competence, progressive values, transcendence values, local cultural wisdom, and sustainability to cultivate responsible entrepreneurship while strengthening participants' economic resilience and social responsibility.

Method

Target Audience, Time, and Location

The community service activity was conducted on Saturday, 7 March 2026, from 09.00 to 12.00 WITA, at the KH. M. Manshur Educational Orphanage (YAPPA) for Girls, Jalan Pendidikan II No. 4, Sidakarya, South Denpasar, Denpasar City, Bali. The target audience consisted of female adolescents aged 10-21 years residing at the orphanage, as well as orphanage staff and caregivers. A total of 27

participants attended, comprising 25 orphanage residents and 2 staff or caregivers, with the majority of participants being junior or senior high school students with no prior formal entrepreneurial experience.

Problem-Solving Framework

The problem-solving framework was developed based on the Education for Sustainable Development (ESD) approach, integrating economic, social, and environmental aspects in a sustainable manner, and consists of three pillars: (1) knowledge enhancement, through module-based extension covering food circular economy concepts and a catalog of Balinese traditional food ingredients; (2) awareness building, through demonstrations of products derived from food waste; and (3) entrepreneurship cultivation, through interactive discussions on strategies for starting household-scale food businesses and case studies of successful young food entrepreneurs in Bali.

Activity Methods

The activity employed a participatory extension method consisting of four stages. First, an interactive lecture on the concept of the food circular economy and an introduction to Balinese traditional food ingredients, in line with the recommendation of the Ministry of Agriculture of the Republic of Indonesia (2023) that effective food extension combines lectures with visual media. Second, small-group discussions (5-6 participants) to identify potential food businesses within participants' surroundings, with results presented in a plenary session. Third, product demonstrations featuring items derived from food waste, including banana peels, coconut pulp, and corn cobs, as well as commercially marketed products based on Balinese traditional food ingredients. Fourth, a question-and-answer and motivational session facilitated by a guest speaker, a young local food entrepreneur who is herself an alumna of an orphanage.

The delivery of educational material was interactive to ensure participants could easily follow the concepts presented. Documentation of this session is shown in Figure 1, which illustrates the facilitator delivering material on the food circular economy and traditional food ingredients to the participants.



Figure 1. Delivery of educational materials on the circular economy and traditional foods

Beyond the lecture session, active participant involvement was also encouraged through interactive discussion, as the group discussion stage required participants to articulate and exchange ideas directly with the

facilitators. This engagement is captured in Figure 2, which shows the interactive discussion and direct interaction between participants and facilitators during the training session.



Figure 2. Interactive discussion and participant engagement during the training

Activity Evaluation

Activity effectiveness was evaluated in three stages. A pre-test was administered 15 minutes before the extension session to measure participants' baseline knowledge. Process evaluation was conducted through observation of participant engagement during the activity, including active participation in discussions, enthusiasm during the demonstration session, and the quality of questions raised. A post-test was administered 10 minutes before the activity concluded, using the same instrument as the pre-test, with a success indicator of at least a 30% increase in participants' average score from the baseline. Participant satisfaction was measured using a five-point Likert-scale questionnaire.

Activity Documentation

As a record of the overall implementation, documentation was also collected at the activity's closing stage. Upon completion of the program, participants, together with the facilitator team, gathered for a group photograph as closing documentation, as shown in Figure 3, which depicts the participants and the implementation team after the community service activity concluded.



Figure 3. Group photo with participants after the community service activity

In addition to documentation with the participants, the organizing team and facilitators were also documented alongside the orphanage management as a token of appreciation for the established collaboration. This final documentation is presented in Figure 4, which depicts the implementation team together with the orphanage organizers and facilitators at the conclusion of the activity.



Figure 4. Team documentation with organizers and facilitators

Results And Discussion

Activity Implementation

The extension activity proceeded according to the planned schedule, beginning with participant registration and completion of the pre-test, followed by an opening session, presentation of material on the food circular

economy and food-waste potential in Bali, demonstration of food-waste-derived products, group discussions, and a question-and-answer and motivational session, concluded with the post-test and satisfaction questionnaire. All participants actively engaged throughout the activity, as indicated by high participation during the food-waste product demonstration session, where participants enthusiastically asked questions and interacted directly with the displayed products.

The group discussion sessions generated five creative food business ideas from participants: producing herbal tea from coffee husk waste, chips made from kepok banana peels, traditional Balinese spice-based dodol, and local Balinese fruit juice. This outcome indicates that the demonstration- and discussion-based participatory method successfully encouraged participants to think creatively in identifying business opportunities from resources available in their immediate environment.

Achievement of Activity Targets

As shown in Table 1, participant attendance exceeded the planned target by 135%, indicating a high level of interest among adolescents in orphanages in creative food entrepreneurship activities. Likewise, the average knowledge score increased by 42%, exceeding the minimum expected improvement of 30%.

The high attendance rate (135% of target) indicates strong interest among adolescents in orphanages in creative food entrepreneurship and reflects the relevance of the activity theme to the target group's actual needs. The average knowledge improvement of 42% demonstrates the effectiveness of the participatory extension method combined with concrete product demonstrations, consistent with findings that food extension, which combines lectures with visual media/demonstrations, is more effective than conventional lecture-only methods [10].

Table 1. Achievement of Community Service Program Targets

Indicator	Target	Achievement	Achievement (%)
Number of participants attending	20 people	27 people	135%
Knowledge increase (pre-post test)	≥ 30%	42%	140%
Participant satisfaction (1-5 scale)	≥ 3.5	4.6	131%
Basic food entrepreneurship understanding	≥ 70% of participants	80% of participants	114%

Factors Contributing to Success

Several factors contributed to the success of this activity. First, the relevance of the activity theme to participants' socioeconomic conditions as adolescents in orphanages in need of entrepreneurial preparation for life after institutional care. Second, the product-demonstration approach made the material more concrete and easier to understand compared to purely theoretical delivery. Third, the involvement of a guest speaker who was an orphanage alumna and successful entrepreneur proved to be a powerful motivator for participants, as it provided tangible evidence that limited economic background is not a barrier to entrepreneurship. This finding is

consistent with Wulandari and Sari, who reported that involving role models with backgrounds similar to participants' increases the effectiveness of entrepreneurship empowerment programs for adolescents in orphanages. Fourth, the varied and participatory extension methods, encompassing lectures, group discussions, and demonstrations, encouraged active engagement among participants throughout the activity [9].

Constraints and Limitations

Although the activity was generally successful, several constraints were identified during implementation. The limited duration of the product demonstration session (30 minutes) meant that not all participants could try the products directly. Digital entrepreneurship material, particularly online marketing strategies, could not be delivered in depth due to the overall time constraints of the activity (3 hours) for covering two fairly broad sub-themes. Limited demonstration equipment also meant that some products could only be displayed in finished form rather than through a live preparation process. In addition, some participants initially showed limited confidence in expressing their business ideas, and limited internet connectivity at the venue hindered the optimal delivery of video-based presentations.

Implications and Development Opportunities

The results of this activity indicate that the circular economy approach is relevant as a food-based economic empowerment strategy for orphanage adolescents, as it utilizes resources already available to participants, namely food waste and local traditional food ingredients, to create economic value without requiring substantial initial capital. This approach aligns with the food circular economy principles developed by the Ellen MacArthur Foundation and supports the policy direction of the Indonesia Circular Economy Roadmap 2025-2035 [4], [6].

As a follow-up, this activity can be developed into a sustained 3-6-month vocational training program with hands-on product-making sessions, supported by partnerships with local Balinese food MSMEs that serve as business mentors. Developing an interactive digital module that participants can access independently, as well as forming a joint creative food business group (KUB) based at the orphanage, also represents opportunities for further program development. Replicating similar activities at other orphanages and among underprivileged adolescent communities in Bali could extend the economic empowerment impact of this intervention model.

Conclusion

The community service activity "Creative Food Processing as a Youth Business Opportunity," conducted at the KH. M. Manshur Educational Orphanage (YAPPA) for Girls, Denpasar, proved effective in increasing knowledge and entrepreneurial motivation in creative food processing among orphanage adolescents. The participatory extension approach, combining interactive lectures, group discussions, and product demonstrations based on food waste and Balinese traditional food ingredients, successfully increased participants' understanding by an average of 42%, exceeding the 30% target, with a participant satisfaction score of 4.6 out of 5 and an attendance rate of 135% of the established target. The

involvement of an alumna of the orphanage as a guest speaker proved to be a strong motivator, consistent with role-model-based learning principles. This activity confirms that the circular economy approach and the utilization of local traditional food wealth constitute relevant and replicable strategies for the economic empowerment of underprivileged adolescents. Follow-up actions, including sustained vocational training, business partnership mentoring with local MSMEs, and facilitation of business licensing and access to capital, are needed to translate participants' knowledge into practical entrepreneurial practice.

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