

Enhancing the Knowledge and Skill of PKK and Karang Taruna Cadres in The Innovation of Mangosteen Fruit Products

¹Suciati*, ¹Wiwied Ekasari, ¹Andang Miatmoko, ¹Neny Purwitasari, ¹Lidya Tumewu, ¹Yanu Andhiarto, ¹Fatin Fadhilah Hasib, ¹Tri Widiandani, ¹Kholis Amalia Nofianti

¹Universitas Airlangga, Indonesia

*Corresponding author

Email: suciati@ff.unair.ac.id

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Abstract

Purpose: The current community service activities aim to provide knowledge and skills related to mangosteen and its processed products to the Songgon Village community.

Method: Transfer of knowledge and skill by lecturing and practice. Pre and post-tests were carried out to evaluate the participants' knowledge before and after the workshop.

Practical Applications: The knowledge and skills gained by PKK and Karang Taruna cadres in this workshop can be implemented in daily life. The participants learned how to make innovative products from mangosteen fruit so that it can be produced commercially. Thus, in the long term, it is expected to increase the income of Songgon Village Community.

Conclusion: The results showed the participants' enthusiasm to participate in this activity, and the pre and post-tests demonstrated increased knowledge and skills. The next step requires intensive support for the Songgon Village community so that their products can be distributed commercially and provide economic benefits.



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Introduction

Songgon Village is located in the Songgon District, Banyuwangi Regency, East Java. The village has an area of around 12,194 km² with a population of approximately 7.8 million. This village is one of the targets for the development of a tourist village in Banyuwangi Regency. The majority of the population is supported by agriculture as their income (Pemkab Banyuwangi). This is supported by the location of Songgon Village, which is situated at the foot of Mount Raung, where the soil is rich and the climate is mild, making it ideal for cultivating a variety of plants. Residents of Songgon Village commonly cultivate mangosteen. This plant is extensively planted in people's gardens or yards, making Songgon Village one of the mangosteen producers in the Banyuwangi. The mangosteen fruit produced so far is only sold to markets both in and outside Banyuwangi and is used for consumption as fruit.

The mangosteen fruit, sometimes referred to as the "queen of tropical fruit", is a fruit that follows a seasonal pattern and is typically harvested between September and April (Jaroensutasinee et al., 2023). The prevailing market price for mangosteen fruit varies between Rp. 15,000 and Rp. 25,000 per kilogram. However, during periods of high production, the price significantly decreases to Rp. 5,000 per kilogram in the market, and potentially even lower at the level of farmers. The mangosteen fruit comprises two main parts: the white flesh that surrounds the seeds and the dark purple rind, also known as the pericarp. The pulp of the mangosteen fruit is recognized for its nutritional value and abundance of bioactive chemicals (Albuquerque et al., 2023; Sarkar et al., 2023). The mangosteen fruit has abundant dietary fibre, carbs, and protein. This particular fruit is rich in several vitamins, such as vitamin A, vitamin C, thiamin (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), pantothenic acid (vitamin B5), pyridoxine (vitamin B6), and folate (vitamin B9).

Furthermore, it should be noted that the mangosteen fruit has a notable mineral content, including calcium, phosphorus, iron, and magnesium, all of which play a crucial role in maintaining optimal health. The peel of the mangosteen fruit is recognized for its abundance of secondary metabolites, which encompass various xanthone compounds such as α , β , and γ -mangosteens, gartanine, 8-deoxygartanin, as well as garcinones C and D. These constituents are considered the primary constituents of the mangosteen rind, as documented by (Ovalle-Magallanes et al., 2017) and (Rohman et al., 2020). The mangosteen rind, commonly discarded, possesses medicinal properties employed in traditional medicine throughout different nations. The mangosteen rind is traditionally used to treat digestive ailments, urinary tract infections, fever, and as a laxative. There is a significant public demand for a range of nutraceutical products derived from mangosteen rind. Various *in vitro* and *in vivo* studies have demonstrated the potential of mangosteen rind as an antioxidant, antibacterial, anticancer, and anti-inflammatory agent (Ansori et al., 2020; Mahmudah et al., 2020).

Given the substantial prospects for product development derived from the mangosteen fruit and the abundant availability of this fruit in Songgon Village, it becomes essential to organize programs aimed at empowering the local community. Specifically, this involves providing workshops to the PKK and Karang Taruna cadres in order to boost the economic worth of the mangosteen fruit by creating various products. The primary objective of this project is to enhance the knowledge and skills of PKK and Karang Taruna cadres in processing various products from mangosteen.

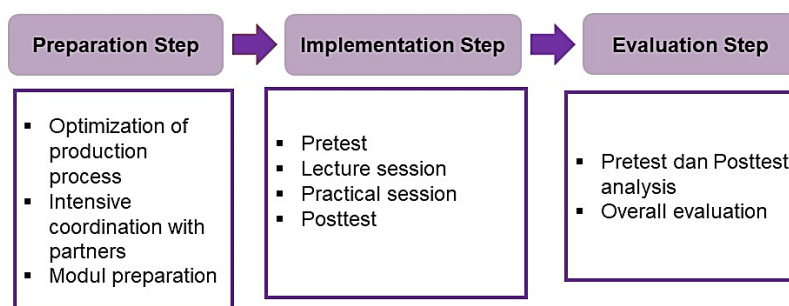
Method

The community service program is implemented using the Participatory Action Research (PAR) strategy. This approach emphasizes the enhancement of community involvement in addressing existing issues (Halliday et al., 2019; Kim, 2019). The participants in this workshop consisted of PKK and Karang Taruna Cadres of Songgon Village. The program was carried out in three steps: preparation, implementation, and evaluation (see Figure 1). The preparation step includes the optimization of the production process of

mangosteen fruit products, namely simplicia, tea, and face masks made from the mangosteen rind and syrup of the mangosteen fruit. During the preparation step, modules and instructional videos were developed to facilitate the dissemination of educational content and training to the participants. At this stage, intensive coordination was also carried out with the Indonesian Pharmacist Association (PC IAI) in Banyuwangi Regency as the collaborator for this program.

The second stage is the implementation of activities. This stage begins with giving a pre-test to get information about the participant's level of knowledge. Next is the delivery of material, including an introduction to the benefits of mangosteen for health, followed by a topic on the use of mangosteen to produce simplicia, herbal tea, face masks, and mangosteen fruit syrup. This session continued with the practice of making various mangosteen products. The implementation phase ends with a post-test to get an overview of the participants' knowledge after giving the material. The final step of the activity involves evaluation, wherein the outcomes of the pre and post-tests are analyzed, and the overall implementation of the activity is assessed.

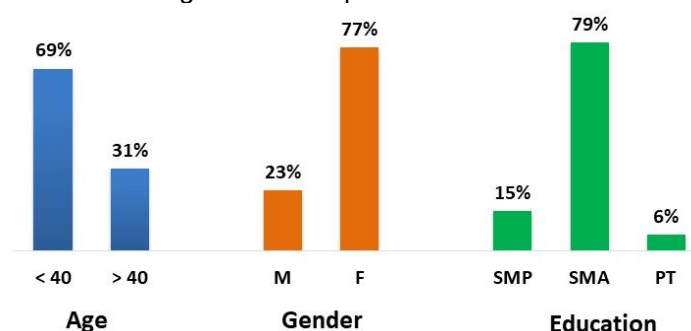
Figure 1. Community Development Program Steps



Result

This activity was attended by a total of 39 participants, including 30 PKK cadres and 9 Karang Taruna members. As shown in Figure 2, most participants were between the ages of 21 and 50, and the majority were female. According to the distribution based on level of education, 79% of the participants were high school graduates.

Figure 2. Participants Distribution



During this program, participants are presented with educational materials through various instructional techniques such as lectures, discussions, and practical exercises. The material presented covers two main topics: firstly, the health benefits associated with the use of mangosteen, and secondly, the various types of processed products derived from mangosteen. Following the lecture session, the participants proceeded to engage in manufacturing activities, namely the production of simplicia, herbal tea, and face masks derived from the mangosteen rind and mangosteen fruit syrup. Figure 3 shows participants during the practical session, and the products are presented in Figure 4.

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Figure 3. Participants practice Making (a) Herbal Tea, (b) Face Mask, and (c). Mangosteen Syrup

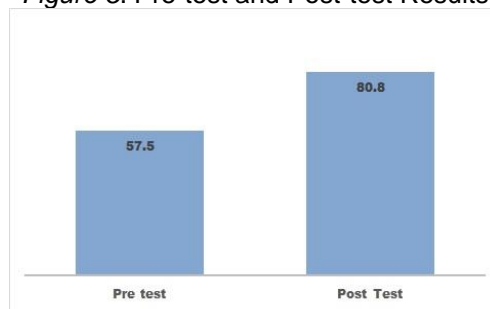


Figure 4. Innovative Products Derived from Mangosteen Produced in the Program (a) Simplicia, (b) Herbal Tea, (c) Syrup, and (d) Face Mask



In order to assess the participant's level of knowledge before and after the activity, pre- and post-tests were conducted. Figure 5 illustrates a significant increase in the participants' knowledge after the activity, as evidenced by the increase in the mean score from 57.5 at the pre-test to 80.8 at the post-test.

Figure 5. Pre-test and Post-test Results



Discussion

This community service program participants were PKK and Karang Taruna cadres from Songgon Village, Songgon District, Banyuwangi. The vast majority of PKK cadres in Songgon Village are classified as economically unproductive housewives. Karang Taruna, meanwhile, is a group of young people whose mission is to develop themselves, grow and develop on the basis of awareness and social responsibility from, by, and for the younger generation, with a focus on achieving social welfare for the community. Karang Taruna is expected to be one of the main drivers of the prosperity of the local community. Therefore, these two community groups were selected as the target of this program.

Participants in this training learned how to prepare mangosteen rind simplicia. Simplicia is a natural product that is dried at temperatures no higher than 60°C (Supriningrum

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et al., 2021). To ensure the hygiene and stability of the final product, drying can be carried out in an oven or direct sunlight, for instance, using a solar shelter or in a clean-shaded place. The steps involved in the production of *simplicia* include wet sorting, washing, draining, chopping, drying, and dry sorting. The produced dried *simplicia* is then stored in an airtight container, placed in a clean, dry location, and protected from direct sunlight. The purpose of the drying process is to lengthen the shelf life of the product. Mangosteen is a seasonal fruit, so producing dry mangosteen rind products in *simplicia* will ensure product availability when the mangosteen season has yet arrived. The mangosteen rind *simplicia* that has been produced can then be used to make other products, namely herbal tea and mangosteen rind face masks.

The participants are then instructed on how to make herbal tea from mangosteen rind. Herbal tea is a beverage product derived from plant parts, for example, leaves, stems, roots, flowers, and fruit, which are consumed by brewing them with hot water (Syafa'atun & Marisa, 2020). For consumption convenience, herbal teas are packaged in tea sachets. In order to prepare mangosteen rind tea, the dried mangosteen rind is simply pulverized and placed in a tea bag. Each tea pouch contains 2 grams of powdered mangosteen rind. Regular consumption of mangosteen rind tea can help maintain and enhance health. This is because mangosteen rind is known to contain various chemical compounds that are beneficial for health, such as antioxidants, antimicrobial, anticancer, and anti-inflammatory agents (Ansori et al., 2020; Mahmudah et al., 2020). Mangosteen rind is also beneficial for weight loss (Kudiganti et al., 2016; Watanabe et al., 2018).

Participants also learned how to prepare face masks from mangosteen rind at this workshop. It has been reported that mangosteen has antioxidant, anti-inflammatory, and antibacterial properties, one of which is against acne-causing bacteria (Yang et al., 2021). The mangosteen rind face mask is made with kaolin clay and rice flour as a medium to provide adhesion to the skin. Using kaolin clay in facial masks can help absorb oil from the skin, remove dirt and dead skin cells, and eliminate blackheads (Hibari et al., 2022). The addition of rice flour to facial masks can assist in brightening and moisturizing facial skin, as well as removing dirt and cell debris (Ghode et al., 2019).

Due to its sweet and slightly acidic flavour, mangosteen fruit is suitable for beverage use. Therefore, in this workshop, mangosteen fruit syrup was made as well. Other ingredients, including secang wood, ginger, and lemongrass, are added to the mangosteen fruit syrup to add flavour and enhance its colour. These additional components were selected due to their easy availability in the community. Mangosteen fruit syrup is suitable for people of all ages due to its pleasant flavour and is made with natural ingredients.

At the end of the activity, a survey was carried out to evaluate the participants' satisfaction with this activity. The results revealed that the participants viewed the activities as highly beneficial and expressed enthusiasm for future activities. Participants' knowledge and abilities have increased as a result of community service activities involving the provision of information through lectures, discussion, and practice. This activity is anticipated to continue in order to monitor the program's success in attaining its primary goal, which is to improve the economy of the residents of Songgon Village. PKK and Karang Taruna cadres who have received training are expected to disseminate the obtained knowledge and skills to other families and Songgon Village residents. In the next project, assistance can be provided for the registration of products so that they can be sold and contribute to economic growth.

Conclusion

In general, the community service programs were executed well and without any difficulties. The conducted training activities proved beneficial in enhancing the participants' knowledge and skills in the production of various mangosteen products. The participants expressed a high level of enthusiasm in applying the skills they had learned to produce various mangosteen fruit products, which is recognized as an essential agricultural commodity

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originating from Songgon Village. The products made have the potential to not only meet individual needs but also to be mass-produced and sold, consequently supporting the long-term economic development of the Songgon Village community.

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