



## Strategy for Providing Feed to Sami Mupu Goat Farmer Group in Wanagiri Village, Buleleng Regency, Denpasar, Bali

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### ABSTRACT

During the coffee harvest season, coffee skins are generated as a byproduct of the coffee processing procedure. The quantity of coffee skin generated is substantial, typically 40% to 50%. Coffee skins are commonly subjected to a drying process and afterward provided to goats as a supplementary feed, typically without undergoing any specific treatment. The cellulose concentration of dried coffee skin is significantly elevated, which can lead to a decrease in its digestion. By employing technological advancements such as fermentation, it is possible to reduce the cellulose content or crude fiber present in coffee skins. This fiber reduction enhances the coffee skin's digestibility and shelf life. The utilization of fermented coffee skin as a concentrated feed source for goats has been observed. Based on scholarly sources, it has been suggested that goats require approximately 10% of their body weight in daily forage feed. Additionally, it is deemed essential to supplement their diet with concentrate feed, ideally amounting to 1% of their body weight, to offer additional nourishment. To sustain a population of 25-50 goats, each weighing an average of 25 kg, farmers are required to supply a daily feed quantity ranging from 75-125 kg. Therefore, group members must possess imperative for group members to possess an adequate provision of feed, including grass and concentrates, to consistently fulfill goats' dietary requirements the group to possess an adequate provision of feed, including both grass and concentrates, to fulfill the dietary requirements of goats consistently. One potential approach to addressing the challenges partners encounter is imparting knowledge, enhancing skills, and introducing suitable technology for by partners is imparting knowledge, enhancing skills, and introducing suitable technology to the strategic provision of goat animal feed. This can be achieved by fermenting coffee skins and producing silage, of fermenting coffee skins and producing silage, augmenting the feed's quantity and quality of the feed while extending its storage duration. The utilization of coffee skin waste, which is produced during coffee bean processing, as a viable feed option for goats is a promising solution. This approach eliminates the practice of stockpiling coffee skin waste beneath coffee trees, eliminates the practice of stockpiling coffee skin waste beneath coffee trees, and eliminates the practice of stockpiling coffee skin waste beneath coffee trees but also mitigates environmental pollution.

## 1. INTRODUCTION

Wanagiri Village is located in Sukasada District, Buleleng Regency, Bali Province. The village is located at an altitude of 1,220 meters above sea level[1][2] and an area of 15.75 km<sup>2</sup>[3].

Wanagiri was chosen because this village is in a mountainous wilderness area, derived from the words Wana, which means forest, and Giri, which means hill. Wanagiri Village was formed in 1973, a merger of 3 banjars, namely Banjar Dinas Asah Panji, Banjar Alas Ambengan (now called Banjar Dinas Bhuanasari according to Regent Decree Number 10 of 1989) and Banjar Yeh Ketipat [3].



Sami Mupu Farmer Group, located in Banjar Dinas Bhuanasari, Wanagiri Village, Sukasada District, Buleleng Regency, is a goat farmer group formed in 2016. The total number of goats raised is around 400 heads spread in several different locations and pens, each cage is filled with 25-50 Peranakan Etawa (PE) goats. Activities of group members other than farmers and ranchers, carrying out traditional and religious activities. The feed given to goats consists of grass and leaves that grow around the pen's location (Figure 1). Production of forage crop feed is very abundant. In addition to utilizing fresh forage as animal feed, group members have also made silage feed from forage. Silage is a forage fodder preserved using fermentation techniques [4]. However, silage manufacturing is still on a small scale due to limited facilities and infrastructure, so the amount is insufficient for the long term, and the supply has not been continuous. Therefore, the amount of silage made needs to be increased by increasing the facilities and infrastructure.

During the coffee harvest season, the coffee processing process produced coffee skins. The amount of coffee skin produced is quite a lot (40-50%), and will usually be stacked under the coffee tree with the intention of fertilizer. Still, coffee skin is very easy to grow mold because of its high water content, which is very dangerous for coffee plants [5]. Coffee skins are also usually dried and given to goats as additional feed, without any special treatment. Dried coffee skin is very high in cellulose content. High cellulose content in a material can reduce the digestibility of the material. [6] stated that one of the alternative feeds for animal feed is obtained from coffee skin waste. With a little technological touch (fermentation), the coffee skin's cellulose or crude fiber content will decrease [7], its digestibility will increase, and the shelf life will be longer. Fermented coffee skin can be used as a source of concentrate for goats.

According to some references, the need for forage feed (grass and leaves) for a goat in a day is 10% of body weight as the main feed, and it is also important to provide concentrate feed as much as 1-3% of body weight as reinforcement feed [8]. This means in 1 pen with several goats of 25 - 50 heads and an average body weight of 25 kg, farmers must provide forage of around 75 - 125 kg and concentrate around 7 - 13 kg daily. However, freshly harvested forage should not be given directly to the farmer but should be served in advance for at least 12 hours to reduce moisture content to prevent abdominal bloating and transmission of parasites such as worms. Thus, group members must have a supply of feed, both forage and concentrates, so that goat feed needs are always met.

The solution to the problems faced by partners is to provide knowledge, skills and appropriate technology regarding the strategy of providing goat animal feed, by utilizing waste (coffee skins) as animal feed, namely making fermented coffee skins [9] and adding facilities and infrastructure for making silage with the aim of increasing the quantity and quality of silage and can be stored longer. Knowledge is provided through counseling, providing short material so that it is easy to understand, while improving skills and appropriate technology is carried out by holding direct practice in the field. We also help with the materials and equipment needed in fermentation and feed making.



**Figure 1.** The Situation and Condition of One of the Sami Mupu Goat Farmer Groups

With community service funded by the Warmadewa University Community Service Institute, the Sami Mupu farmer group hopes to have knowledge and skills in providing sufficient goat feed throughout the season and coffee waste in the form of coffee skins can be used as goat feed and does not pollute the environment.

## 2. MATERIALS AND METHODS

### 2.1. Training Materials

To support the counseling and training process, providing feed to goats requires the following infrastructure: 1) a Liflet containing how to make silage from forage and fermentation of coffee skins for goat feed. 2) Schedule of activities and time required. 3) Tools for fermentation practices in the manufacture of feed.

### 2.2 Implementation Method

The methods implemented include coaching, training, mentoring, and structured consultation on various obstacles to providing added value for partners. The method is one of the tools to achieve goals. Various methods that can be applied in the implementation of community service include lectures, questions and answers, discussions, demonstrations, and joint training. These methods can be implemented separately or in combination according to the capabilities and characteristics of the material studied.

The implementation of this PKM activity program begins with lectures and discussions, training, and questions and answers. a) Lecture and Discussion Method: This PKM activity will begin with giving lectures and counseling to Sami Mupu Farmer Group members. The implementation team gave participants lectures on the activity material. The material provided is related to the types of forage for goats, the potential of coffee skins as animal feed, fermentation technology, and the process of making forage silage and coffee skins for goat animal feed. This activity aims to provide theoretical knowledge to group members about the material of the activities to be carried out. The activity then continued with a discussion to deepen respondents' understanding of the strategy of providing goat feed through making feed from coffee skins and the necessary facilities. At the time of this activity, more pictures and explanations were shown about the stages of the fermentation process in making feed, and the equipment needed, with the hope that respondents could understand faster. b) Demonstration and Training Methods: Demonstration and training activities are follow-up activities carried out by PKM implementers on lectures and discussions that have been carried out. This activity is carried out by demonstrating the preparation of materials and equipment, fermentation process, storage and handling at the end of fermentation.

### 2.3 Stages of Implementation

The implementation of Community Service activities is carried out in several stages, namely:

- 1) Site survey to find problems from the group, planning the implementation of extension activities, planning demonstration activities, and training.
- 2) Interviews and questions and answers about problems faced by partners, as well as planning activities that show steps to solve the problems faced.
- 3) Partners will be given material that has been prepared by the team in the form of leaflets about the types of forage for goats, the potential of coffee skins as animal feed, fermentation technology, the process of making forage silage, and coffee skins for goat feed
- 4) Problems in goat feed provision will be overcome by counseling, demonstrations, practices, and handing over material and equipment assistance to partners to support the "Strategy for Providing Feed to Sami Mupu Farmer Group".

Partner participation in the implementation of action research activities is needed for the smooth process of this activity

- 1) Partners are expected to abide by all agreements that have been made
- 2) Partners are expected to be disciplined and earnestly follow and carry out all activities until all activity plans end.
- 3) After the PKM activities end, partners can continue the activities well, and the pioneered activities can develop.
- 4) Assistance, evaluation, and cooperation will continue after the PKM program ends.

### 2.4 Post-Program Handling

The evaluation was carried out by giving participants questionnaires to determine the activity's success rate. The implementation of this community service activity can run smoothly, participants are enthusiastic and active in participating in training from beginning to end. Enthusiasm and enthusiasm can motivate Sami Mupu farmer group members as trainees to make fermented feed from coffee skins available around the location.

## 3. RESULT AND DISCUSSION

### 3.1 Implementation of Activities

The activity was attended by 8 group members in the form of counselling on the types of forage for goats, the potential of coffee skins as animal feed, fermentation technology, the process of making forage silage, and fermentation of coffee skins for goat animal feed. The activity continued with the direct practice of making fermented feed from coffee skins for goats.



**Figure 2.** Counselling Activities and Practices of Making Goat Animal Feed from Coffee Skin

The activities included counseling on theoretical studies to provide an understanding of the material for providing feed and fermentation technology in the use of coffee skins for goat animal feed. All group members actively participate in activities from beginning to end, namely the practice of making feed from coffee skins, and expect continuous assistance in the next process, both maintaining quality, packaging, marketing, and cultivation of goats

### 3.5 Inhibiting and Supporting Factors

#### 3.1.1. Inhibiting factors

In PKM implementation activities, the inhibiting factor is the difficulty of finding a schedule for implementing activities due to traditional ceremonial activities in the community. When implementing service activities in coffee, plants have not produced much, so the availability of coffee skins is also limited. Coffee is a seasonal crop, and the peak of coffee bean production in Wanagiri is in August.

#### 3.1.2. Supporting factors

The group was very enthusiastic about making animal feed from coffee skins. Participants were very excited, tried to arrive on time to the place of activity, and promised to independently apply the knowledge and skills of making feed from coffee skins. This community service activity took place smoothly, supported by the quite sunny weather at that time, considering the erratic weather that month.

#### 3.1.3. Solutions and follow-up

The obstacles faced in implementing PKM can be overcome with good communication between the team, the group leader, and village officials so that counseling activities and practices can occur smoothly.

#### 3.1.4. Next Plan

Furthermore, the community service team will continue to accompany the group so that it succeeds in making animal feed from coffee skins in large quantities and good quality, able to market with economical packaging and attract consumers. In addition, the team will continue to accompany the group in the cultivation of goats in terms of maintenance management, feed, disease prevention, production, and marketing.

#### 3.1.5. Strategy steps for further realization

The next strategy we do is to analyze the nutritional quality of coffee skin silage feed produced by carrying out various stages, including testing and calculating nutrients in coffee skin silage feed. In addition, to improve product quality, it is very important to carry out attractive and economical packaging.

## 4. CONCLUSION

Coffee skin waste from coffee bean processing activities can be used as goat animal feed, no longer stacked under coffee trees, and does not pollute the environment. The knowledge and skills group members possess have succeeded in making a product, namely goat animal feed from coffee skins.

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