

Sustainable Agriculture: Empowering Youth Organization through The Modernization of Forage Technology in Desa Ganjarsari

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Abstract

RW 03 Desa Ganjarsari, Kecamatan Cikalong Wetan, Kabupaten Bandung Barat, Jawa Barat is an area that has a lot of potential for goat farming, particularly for youths who are involved in youth organizations and who also own agriculture businesses. Thus, the preparation and accessibility of conventional animal forage are the matter at hand. This empowerment program's purpose is to provide training in the production of complete fermented silage forage as a modern forage technology to promote sustainable agriculture among youths. The program is put into action using the discussion technique for planning, the learning-by-doing method for executing it out, both verbal and written evaluation methods, as well as the testing of products to determine the program's effectiveness. The outcomes include guidelines for making complete fermented silage, increased awareness of the youth organization, their ability to produce modern forage, and their willingness to act as change agents to modernize forage technology in order to achieve sustainable agriculture in the area as a whole. It has been proven as an improvement towards modern farm activities, since one of the parameters of modern farm activity is the ability to overcome low forage quality. Further development needs to be made, including the establishment of youth-based farm groups and discussions on the well-being of goats and stables.

Keywords: Community Empowerment; Modernization of Forage Technology; Sustainable Agriculture; Youth Organization

INTRODUCTION

One of the most common and viable occupations for people living in rural areas is agricultural work, which includes rearing animals as a manifestation of harnessing the biodiversity of the surrounding environment, including the people who lives in Desa Ganjarsari, Kecamatan Cikalong Wetan, Kabupaten Bandung Barat, Jawa Barat. According to the basic features of having large land, an area temperature of approximately 27–36 degrees Celsius, and plenty of access to forage like grass, the Desa Ganjarsari region has environmental qualities that are excellent for carrying out animal agricultural activities (Yudha, 2022).

Particularly in RW 03 Desa Ganjarsari, goat farming is the only significant occupation and the community's primary source of income. The researchers' conversations with Mr. Hadori, the community most influential in RW 03 Desa Ganjarsari, provided confirmation of this. Along with direct field observations, these interviews helped gather information on farms conditions. The RW 03 neighborhood engages in traditional livestock farming, also known as backyard farming, which makes use of open space near inhabitants' homes, has a small number of livestock, medium-tech inputs, family labor, and a moderate return (Andaruisworo, 2022). Even said, RW 07 has a greater potential for animal husbandry due to the rising demand from goat dealers for livestock and the presence of local youth organizations who own the animals in lieu of simply working with them.



Figure 1. Interview with Mr. Hadori
(Source: Private Documentation)

The interview revealed a number of issues with farm activities, one of which being the issue regarding animal forage. The process of making animal forage, which involves cutting vast amounts of odot grass and cassava leaves every day, is seen by the community as requiring a lot of time. As a result, the community occasionally dedicates the majority of the day to carving. This was also followed by the animals' behavior, which showed they were fatigued from eating forage by not eating the entire amount they were given in feed. This condition was further supported by Ginting & Ritonga's (2018) study, which found that monotonous forage can make livestock goats bored and less hungry, which also has an impact on the availability of nutrient-dense food. In order to improve goat forage technology, training in the production of completely fermented silage is prioritized as part of community empowerment.

Changes have been made to the management of animal feed collection in an effort to modernize animal feed according to community capabilities. The community has tried to divide the tasks in collecting concentrate feed (cassava) and grass feed (odot grass), which are then respectively given to livestock. These efforts haven't been the best at producing animal feed that is of higher quality and more efficient, though, so more assistance is required.

The necessity to support community needs in carrying out agricultural activities in order for them to achieve Sustainable Agriculture led to the determination that the subject of empowerment in modernizing goat forage technology in a more modern approach. This is consistent with the actual beneficial effects of the support process in optimizing the thus-far made efforts (Widiawati, Kusumaningtyas, & Suliswaningsih, 2021). An agricultural or animals operation that adheres to the concepts of economic, environmental, and social sustainability is known as sustainable agriculture (Velten, Jager, & Newig, 2021). One of the fundamental components of sustainable agriculture is fermented complete silage feed, which has the added benefit of helping the community produce long-lasting goat forage while simultaneously enhancing goat nutrition in accordance with the idea of ecologically friendly forage (Ahni, Hamid, & Abdullah, 2019). Additionally, this is in line with the second goal of the United Nations' Sustainable Development Goals (SDGs) "End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture" (United Nations, 2022). Therefore, by modernizing forage technology, people can take advantage of the benefits of social sustainability through the simplicity of the feed preparation process, economic sustainability, which is improved livestock quality, environmental sustainability, which is ecologically friendly forage.

The training activities are centered on Karang Taruna as a youth organization. The decision to choose youths as activity partners is based on their enormous potential to affect change in a society that is still in advancement. In addition, a lot of young people attend Karang Taruna, a community cadre who is regarded as having the ability to pick up skills

quickly in any circumstance (Asyari, Zidni Ilma, Wida Dina Tinta, & Mahlullah, 2022). The Ministry of Social Affairs of the Republic of Indonesia has designated Karang Taruna as one of the pillars in achieving social welfare due to the high expectations of the local community for youth in bringing about positive change (Suradi, 2019).

This empowerment effort was conducted as one of the projects for the Sustainable Community Empowerment and Independent Learning Campus Program organized by the Agent of Change student group "Satria Rancage" under the Sociology Education Study Program and the Institute for Research and Community Service at Universitas Pendidikan Indonesia. The goal of empowerment through training in modernizing goat forage is to help bring up social change in the field of goat forage technology through the production of complete fermented silage, which can facilitate and benefit society in terms of the economy, the environment, and social welfare. The Karang Taruna who have received training are also expected to act as change agents in the community for sustainable agriculture.

IMPLEMENTATION METHOD

Four people, including one village elder and three entrepreneurs of goat livestock businesses, were the targets of the comprehensive fermented silage instruction. The three entrepreneurs were also representatives from Karang Taruna. The location used as the training ground was the home page of Mr. Hadori, a prominent member of the community. On April 30, 2023, the training was conducted by the group's agent of change leader.

Discussion is the method used for the program's preparation with youth organizations and community leaders since it promotes two-way communication and both parties' willingness to be open to new ideas (Mahmudah, Abdullah, Rodiyah, & Susilawati, 2020). For the goal of an open approach and the exploration of experience and expertise of the targets, non-formal cooperative conversations were conducted during the program's development phase. The selection of a youth representative's contact person is made for members who have the strongest internet signal in order to encourage online talks, as internet signals and the lack of adequate communication tools are some of the obstacles to communicating. In order for the target to approach the next level of empowerment with good excitement and seriousness, the session also offered materials and increased understanding regarding the advantages of economic, environmental, and social sustainability through the production of complete fermented silage. At this point, it was also decided that complete fermented silage might require preparation as well as tools and resources.

The equipment needed for the training includes a large bucket for storing forage, a small bucket containing the probiotic liquid, a dipper, scales, and a plant sprayer. Green feed, concentration feed, and additive feed need to be prepared as ingredients. The three feeds are combined to create the complete fermented silage, which is then fermented with molasses as a probiotic liquid, water, minerals, and vitamins, and a blend of 5% additive feed, 25% concentrate feed, and 70% grass feed. This is in compliance with the requirements of the complete fermentation silage ratio, which states that grass feed, concentrate feed, and additive feed should be combined in a ratio of 7: 2: 1 to satisfy 70–90% of the nutritional needs of animals (Andriani, 2021). Then, basic instructions for creating complete fermented silage will be given online using these tools, ingredients, and formulas.

Furthermore, the target receives hands-on instruction, support, and consultation during the implementation stage according to the researcher's participatory use of the learning by doing method (Febriansah, Hanif, & Taurusta, 2022). Additionally, this technique enables the target to learn novel skills through his practice-related experiences (Widiawan, 2023). As a result, throughout the implementation phase, silage production will be jointly carried out by empowerment partners and researchers.

Finally, the evaluation process is completed by discussion and recording while using both written and verbal evaluation methods (Yusnandar, Deliati, & Jufrizen, 2019). To assess the overall effectiveness of the program, it is crucial to evaluate a number of activities and the outcomes of those activities (Mufrodi, Robi'in, & Noviyanto, 2021). Trials on goats will be used to jointly assess the success of complete fermented silage products, and compliance with the success indicators for complete silage products, namely (Andriani, 2021); (1) A yellowish green color; (2) When squeezed, the soft texture releases no water and has not an unpleasant odor.; (3) Decent smell. A concept map of the entire set of initiatives for producing complete fermented silage as a modernization of forage technology is shown below:

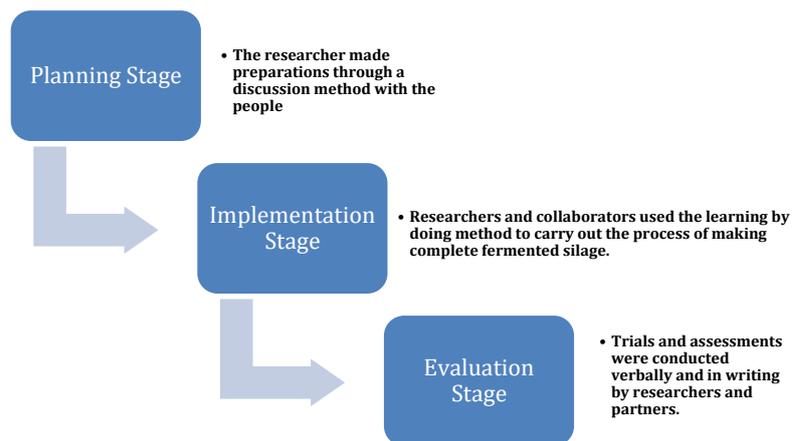


Figure 2. The Program Concept Map
(Source: Private Documentation)

RESULT and DISCUSSION

In the planning stage, researchers and the people hold informal discussions on the technicalities of producing complete fermented silage as a cutting-edge forage technology. Information about the youth's long-standing desire for modern forage feed in this manner was discovered as well throughout the discussion. The researchers then provided information on the advantages and benefits of complete fermented silage, particularly as a forage technology that makes it simpler for farmers to produce goat forage (Rokhayati, 2023), as well as modern forage technology that improves the nutrition and completeness of livestock's diets (Sugiarti, Fitriani, & Samudera, 2020). These two benefits result from the modernization of forage technology, one of which is complete fermented silage, which are resulting in advantages that are accomplished. To encourage communication and openness between the two sides, the submission of the information is carried out in a casual manner and with the help of the language spoken in the area.

Next, the researchers prepare the equipment and resources required to create a complete silage with the aid of the youth. The preparation of grass feed and concentrate feed is the responsibility of the youths, while the preparation of additive feed is the obligation of researchers. The full list of resources required, including tools, materials, and manufacturing stages, is entered online, and sent to the Karang Taruna contact person as follows:

Tools:

1. A bucket with a capacity of 100 – 150 L
2. A small bucket with a capacity of 5 L
3. Liquid Sprayer

4. Weighing Tool
5. Cutting Tool
6. Plastic Mat/Tarp

Materials:

Grass Feed:

1. 50 Kg of Dried Odot Grass

Concentrate Feed:

1. 15 Kg of Cassava
2. 5 Kg of Rice Bran

Additive Feed:

1. 40 ml of Molasses
2. 40 ml of Effective Microorganism 4 Peternakan (EM4)
3. 50g of Animal Minerals and Vitamins
4. 2 – 3 L of Water

Complete Fermented Silage Making Steps:

1. On a tarpaulin or large piece of plastic, dried odot grass is cut and chopped with a chopper into pieces that are between five and ten cm in length.
2. The cassava is sliced and cut into small pieces using a chopper.
3. Molasses, effective microorganism 4 Peternakan (EM4), water, and a number of minerals and vitamins are combined to create a probiotic liquid. Stir, then allow to rest for five to ten minutes.
4. Over the established grass, add rice bran and cassava.
5. Spray the probiotic liquid evenly over the surface of the grass feed and concentrate feed after letting it sit for five to ten minutes.
6. After spraying the feed with the probiotic liquid, mix it thoroughly in order to combine it.
7. Place the mixed forage in a sizable barrel or bucket and press it down until it fills the container entirely and only has a small air gap remaining.
8. Close the big barrel/bucket tightly.
9. For around 14 days, let the process of fermentation continue.
10. The feed can be given to livestock after 14 days.

The author provides a visual aid in the form of a chart that's related to the more general terms procedure for producing fermented silage, which will make the process easier to follow. These steps are as follows:

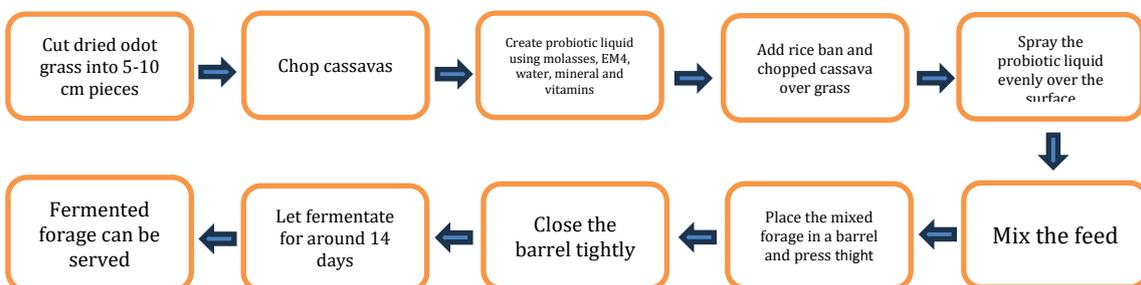


Figure 3. The Visual Step by Steps
 (Source: Private Documentation)

The author provides specific percentages in the following Table 1. to help readers understand the amounts of ingredients used.

Table 1. Comparison of Grass Feed, Concentrate Feed and Additive Feed Percentages

Grass	Concentrate	Additive
Odot Grass 50 Kg	Cassava 15 Kg Rice Ban 5 Kg	Water 2 L Molasses 40 ml EM4 40 ml Mineral 50 g
Total 50 Kg 69,34 %	Total 20 Kg 27,73%	Total 2,1 L 2,87%

(Source: Research Data)

Moreover, the researchers and the youths completed each stage of the production of completely fermented silage in accordance with the earlier provided instructions. Despite the researcher's involvement in the manufacturing processes, the idea of learning by doing is kept prioritized by setting the steps up for independent training, support, and consultation at every stage that needs to be carried out. The phase of program implementation is documented in Figure 4-6.



Figure 4. Grass and Concentrate Feed
 (Source: Private Documentation)



Figure 5. Producing and Spraying of Probiotic Liquid
 (Source: Private Documentation)



Image 6. Group Photo
 (Source: Private Documentation)

As mentioned in the previous steps for manufacturing fermented forage, one of the obstacles in making fermented feed is making sure the right mixture is used to make probiotic liquid. The author provides an example of a probiotic liquid whose mixture is displayed in Figure 5. to make it simpler to create. As we can see, the probiotic liquid that

will be sprayed over the feed has a brownish tint as a result. The group photographed in Figure 6. is comprised of two members of the "agent of change" empowerment group, three livestock entrepreneurs who are members of Karang Taruna, and one of the community leaders, Mr. Hadori.

On May 13, 2023, following a 14-day fermentation period, the evaluation stage was completed by conducting a forage experiment and evaluating the beneficial qualities of the previously described fully fermented silage. The following are product trials and product documentation for complete fermented silage forage.



Figure 7. The Complete Fermented Silage Product
(Source: Private Documentation)



Figure 8. Forage Try-Out
(Source: Private Documentation)

The complete fermented silage product that was seen at the time of evaluation met the requirements for a quality silage because it was yellowish green in color, did not release any water when squeezed, and had a pleasant scent, based on the appearance and color of the forage seen in Figure 7. The substance was quickly embraced by goats with a voracious appetite after being tried on a number of goats, based on the evidence try-out that can be seen in Figure 8. The complete fermented silage production scheme has thus been successfully put into practice. Youth organizations still require significant online and offline support in order to gain independence and modernize forage technology toward a more effective and high-quality one, which leads to sustainable agriculture, despite the fact that guidelines have been provided regarding the tools and materials used in the manufacture of forage.

Consequently, given that one of the requirements of modern livestock farming is lowering the degree of difficulty in producing high-quality forage, improvements to more modern farm activities have been effectively completed (Nisa, Aminudin, & Fahrudi, 2019). This has been proved by Karang Taruna's ability to produce higher-quality fermented forage and the methods used to make it. In addition, Karang Taruna is dedicated to becoming a change agent in the realization of sustainable animal husbandry and is growing increasingly conscious of the modernization of animal forage.

CONCLUSION

Within the framework of a sustainable and independent learning campus independent community empowerment program, the program to produce complete fermented silage forage as a form of modernizing forage technology to achieve sustainable agriculture has been carried out, with the following results:

1. Karang Taruna awareness regarding modernization of forage technology in the context of sustainable agriculture.
2. Guidelines for making complete fermented silage as a modern forage technology.
3. Karang Taruna's ability to produce complete fermented silage.
4. Karang Taruna's willingness to become agents of change in sustainable agriculture through modernization of forage technology in the surrounding community.

The program's strategy is straightforward and adaptable, allowing empowerment targets to participate in the activities as a whole without encountering substantial difficulties. This program's limitation that the area is not too big prevents it from focusing on a lot of targets is its main flaw.

Following that, further developments and follow-ups can be made based on this research:

1. Development and the formation of youth-based farm groups.
2. Sustainable agriculture training related to goat and barn health.

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