

Program to Increase the Effectiveness and Efficiency of Organic Fertilizer from Goat Manure in Wonorejo Village, Situbondo Regency

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Abstract

The Community Service Program was carried out in Wonorejo Village, Banyuputih District, Situbondo. The program implementer is a Community Service team and students participating in MMD 1000 Villages in 2023 funded by MMD 1000 Villages Grant Universitas Brawijaya. The target recipients of the program are members of the *Soponyono Kendal* farmers group that produces organic fertilizer and the purpose of the program was to aid facilities and training for effective organic fertilizers processing activities. The methods used are Focus Group Discussion, hybrid extension, providing modules, providing production advice, and assistance in making NIB/BIN (Business Identification Number) as legalization of business production. The result is that the program has succeeded in achieving the planned output target. Moreover, this activity is also able to involve the village government and BABINSA (*Bintara Pembina Desa/Village Development Officer*).

Keywords

Goat Faeces; Hybrid Extension; Legalization; Module



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1. INTRODUCTION

Desa Wisata Kebangsaan Wonorejo is located at the eastern end of Situbondo Regency and has an area of 414,019 Ha. Wonorejo Village is the easternmost village in the Banyuputih sub-district. The village is on the border between Banyuwangi and Situbondo, passing through the Baluran forest. It is located at the southeastern end of the city center of Situbondo Regency, approximately 78 km from Situbondo and 30 km from the center of Sumberwaru District, and serves as a buffer zone for Baluran National Park. It is a protected area for biological natural resources and their natural ecosystems as a supporting capacity for international-class tourism potential. A buffer zone can be interpreted as an area that surrounds or adjoins the core zone and is identified to protect the core zone from the adverse effects of human activities (Gunawan, 2022).

Wonorejo Village can be reached easily using private or public transportation which is supported by good road infrastructure. In general, the physical condition of Wonorejo Village is a forest and hilly area and has similarities with other villages in the Banyuputih District area. The potential of this village is beef cattle and goat farming. *Soponyono Kendal* Goat Farmers group is one of the livestock farmers groups in Wonorejo Village which comprises 12 goat farmers. It was established in 2012, the number of goat owners was only around 3-11 heads, and in 2023, it has grown to a business scale of 10 to 70 heads. The positive impact of this business development is increasing the welfare level of farmers and their families. However, the negative impact of increasing livestock businesses is poor manure waste processing. On the other hand, this pile of manure also has a huge potential for organic fertilizer because it is needed by most farmers in Wonorejo Village and the area around Baluran National Park. Thus, in 2019, farmers began to process goat manure into organic fertilizer manually. The problem faced by farmers is mainly because the production process is not efficient, thus they need production facilities and training to increase product quality and quantity.

Soponyono Kendal farmers group has been already processing manure into organic fertilizer, however, it can only process a small part of the manure produced due to the low-capacity feces grinding machine. On the other hand, the significant potential market demand for organic fertilizer amid expensive and scarce inorganic fertilizers (Pamungkas & Pamungkas, 2019) state that livestock waste, such as feces, urine, and feed residues left without further handling, can cause environmental pollution and health problems in the community around the farm. Manure processing needs to be done to reduce environmental pollution.

Through the 1000 Village Strategic Community Service Grant, the main product of organic fertilizer, community service activities were carried out in Wonorejo Village. The outcome is that Wonorejo Village becomes a producer of organic fertilizer in the local community. In 2024, hopefully, organic fertilizer processing businesses can meet the needs of farmers in the broader area and reduce waste significantly. The urgency of this community service program is based on the results of the initial survey and data obtained that it is a potential area for goat business development that does not disturb the ecosystem of Baluran National Park; the available human resources have a strong desire and aspiration to develop themselves by establishing farmers groups. There is also a potential workforce in the organic fertilizer business, especially from the youth and women who are involved in the family livestock business. As a national village launched by the government on May 2, 2015, the organic fertilizer business is one of the unifiers of five religions in the community in economic activities. This will be an area

adjacent to tourist attractions, and all economically valuable businesses (including goat livestock and organic fertilizer) can get extra promotions.

2. METHODS

Based on the waste problem and the development of goat livestock businesses in Wonorejo Village, Situbondo, it is necessary to carry out a community service program. The program was carried out by *Doktor Mengabdi* Team from Brawijaya University Malang. The members are from the Animal Science, Law, and Engineering Faculty. The activities applied were FGD (Focus Group Discussion), training, and giving organic fertilizers processing. The participants are 20 members of the *Soponyono Kendal* Farmers Group who are actively involved in the organic fertilizers processing business. The community service started in April 2023 to November 2023.

3. FINDINGS AND DISCUSSION

The implementation of the results of community service by the MMD 1000 Village Grant Team is carried out in stages. The order of implementation of community service activities is as follows.

Table 1. Problems, Solution, Output, and Target of The Project

No.	Problems	Solution(s)	Outputs and Methods	Target
1.	Goat feces waste that needs to be processed	Development of feces processing business into organic fertilizer that is more effective, efficient	Increasing the amount of organic fertilizer production of goat feces	There is an increase in the quality and quantity of organic fertilizers
2.	Simple processing of goat feces	Provision of grinding machines, fermentation sprayers, sack sewing machines, and carts	The use of grinding machines, fermentation sprayers, sack sewing machines, and carts in the processing of	Farmers can use organic fertilizer processing machines

			organic fertilizers	
3	Need knowledge and skills in goat business management	Extension on goat business management	Method: Lecture Media: LCD and demonstration Extension teaching materials; video	Farmers have goat business management skills
4.	Need knowledge and skills in waste processing according to SNI (<i>Standard Nasional Indonesia</i>)/INS (Indonesian National Standard)	Extension of waste processing by INS	Method: Lecture Media: LCD and demonstration Extension teaching materials; video	Farmers have waste processing skills according to INS
5.	Knowledge of organic fertilizer business licensing is needed	Extension of organic fertilizer business licensing	Method: Lecture Media: LCD and demonstration Extension teaching materials; video	Farmers know organic fertilizer business licensing

3.1. Participatory Needs Mapping Between the UB Team, MMD 1000 UB Village Students, and Soponyono Kendal Farmers Group

The needs mapping meeting was held on Tuesday, July 4, 2023, to explore the potential of villages and the problems faced by villages, especially farmers. Participatory data mining is needed so that community service is right on target. This follows the opinion that participation in development in the current era is needed to garner "voices" from the community so that development is on target. Participation requires support from all stakeholders, especially the government, donors, civic groups, and even the general public (Tufte & Mefalopulos, 2009).



Figure 1. Mapping the needs, problems, and potentials of Wonorejo Village and extension on organic fertilizers attended by three stakeholders

The needs mapping meeting was conducted by the parties, namely the *Soponyono Kendal* Farmers group, the Village Government represented by the Village Head Sumarto Adi, academics consisting of 1000 students who participated in the MMD (*Mahasiswa Membangun Desa*) program, and the Community Service Team from Brawijaya University. The results of this meeting provided opportunities for community participation represented by farmers groups in the development of Wonorejo Village, Banyuputih District, Situbondo. In this case, farmers' groups are given access to livestock and agricultural development, especially in utilizing animal manure (goat) and socializing the advantages of organic fertilizer to farmers in Wonorejo Village and its surroundings. The village government also allows farmers' group members to express their difficulties in developing group programs. The village program will be adjusted as much as possible to the needs and desires of farmers, especially those who need financial support from the village.

These participatory needs maps get several important points, such as village institutional strengthening is strengthened by involving all community members in goat manure waste management. The other point is the production of organic fertilizers is improved with the help of machines and laboratory testing so that the resulting fertilizers are of higher quality and the production process is more effective and efficient. Comprehensive improvement was found in increasing farmers' knowledge and skills about livestock business management, manure processing, licensing, and marketing of organic fertilizers.

This activity follows the opinion of (Servaes, 2008), who stated that participatory communication, according to UNESCO at the meeting in Belgrade in 1977, was broken down into involvement in management, access, and participation. The definition of

such participatory communication points is first access, which is how people can choose which programs they need and want that are relevant to their lives. The authorized institutions will hopefully get a response from the community they target. The media is a party that has an important role in providing access to the community. Secondly, participation in community involvement in communicating with other parties, especially in planning and managing production processes, management, and communication systems. Representation of community members and public consultation are also possible in decision-making. Thirdly, self-management is the highest form of community participation. The community is involved in planning, communication, policy formulation, and decision-making.

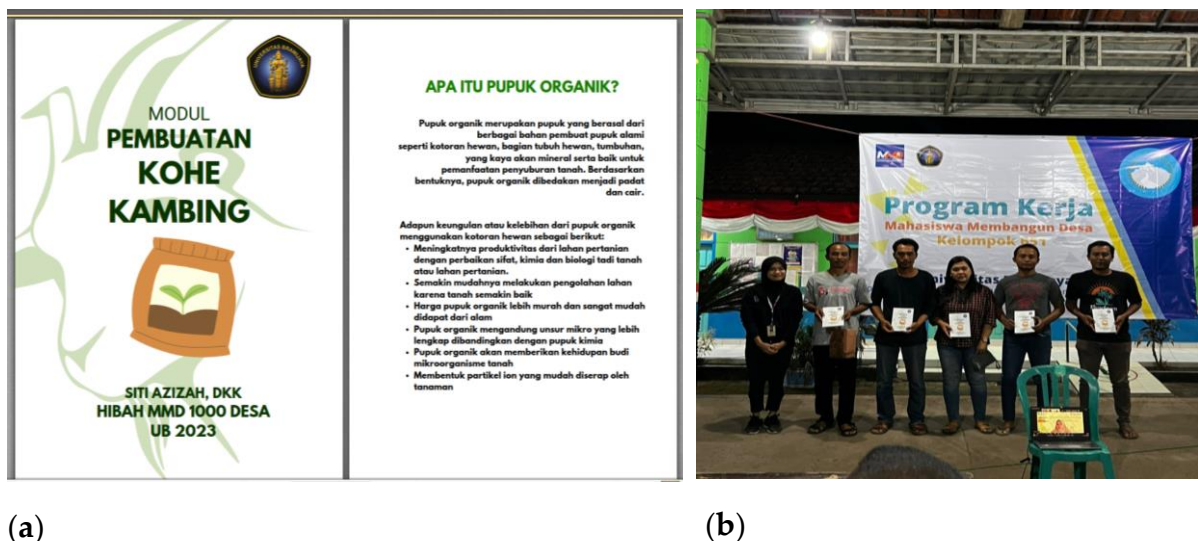


Figure 2. Extension media to help improve farmers' knowledge and skills (a) Goat Faeces Making Module; (b) Handover of modules to representatives of *Soponyono Kendal* farmers group members

Figure 2 is a module given to breeders to increase farmers' knowledge about organic fertilizers. The module is an extension of print media used to understand organic fertilizer from goat manure. Some of the points included in the module are Understanding organic fertilizer, the process of processing goat manure into organic fertilizer, some alternative ways of processing goat manure, and the quality indicators of organic fertilizers.

The material in the module is adjusted to the opinion of Surya et al. (2021) that excess organic fertilizer using animal manure is quite a lot. The fertilizers can increase the content of organic matter and nutrients in the soil will naturally improve the properties, chemistry, and biology of the soil or agricultural land, to make it tillage because the soil is better, lower the price of organic fertilizer, and very easy to get from

nature; it contains more complete microelements compared to chemical fertilizers and will give life to soil microorganisms. In addition, organic fertilizers can mobilize or bridge nutrients in the soil so that it will form ion particles that plants easily absorb, and release soil nutrients very slowly and continuously, thus helping to prevent the occurrence of excess supply of nutrients that make plants reference, able to maintain moisture in the soil so that it will reduce the pressure or tension of soil structure on plants, helps prevent topsoil erosion and able to maintain soil fertility levels.

The reason for choosing the use of printed modules is because they have the advantages of being durable, reaching many people, not high costs, not needing electricity, being carried everywhere, leveraging a sense of beauty, facilitating understanding, and increasing learning passion (Jatmika et al., 2019). The life of farmers in rural areas who are not familiar with digital media and the characteristics of the module does not require electricity or internet signals, making the printed module very appropriate for farmers in Wonorejo Village. Most farmers claim to be helped by additional knowledge from the provision of modules. Especially because so far the quality of organic fertilizer is only based on the experience and testimonials of farmers who use it. After studying the quality indicators of organic fertilizers, farmers realize that reliable laboratory tests are needed to convince farmers about the advantages of organic fertilizers and are willing to switch from inorganic fertilizers.

3.2. *Provision of Organic Fertilizer Production Facilities*

The assistance of organic fertilizer production facilities is one of the community service activities whose results can be directly felt by *Soponyono Kendal* member farmers. The obstacles faced in the production process are low-quality manure grinding tools and sprayers. In addition, sack sewing machines are still borrowed from other farmers' groups. With this assistance, there is a significant increase in production because the results of the manure grind are getting smoother, the enzyme spraying is getting flatter, and there is no need to wait for the turn to borrow a sewing machine.

A good sprayer with an even spray is needed because all goat manure must be exposed to EM4. The EM4 solution is sprayed evenly on the bed of goat manure. The dirt must be turned over, and the EM4 solution re-sprayed all over the part. After it is evenly distributed and the goat manure is slightly damp with a wetness level of about 30–40 percent, put the manure in the sack, but not too full. Tie the sack with a rope and place it in the shade (<http://cybex.pertanian.go.id/artikel/99915/fermentasi--kotoran-kambing/>).

The next provision of facilities is to test the content of organic fertilizer products from farmers' groups. The purpose of laboratory tests is to determine whether fertilizer

meets the minimum standards set by the government. Figure 3 shows the laboratory test results of *Soponyono Kendal* organic fertilizer.

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Figure 3. Laboratory test results of organic fertilizer produced by *Soponyono Kendal* Farmers Group

Based on Figure 3. It is known that the laboratory test results are then compared with the standard quality of bulk organic fertilizers based on the Regulation of the Minister of Agriculture Number 70/Permentan/SR.140/10/2011 concerning Organic Fertilizers, Biofertilizers, and Soil Improvers. The results of the organic fertilizer test showed a value of C / N 7 when compared to the bulk fertilizer standard of 15-25. It was concluded that the fertilizer produced by the *Soponyono Kendal* farmers group still requires additional carbon sources. The solution to quality improvement is to supplement with carbon-source materials. Additional carbon can be from harvest waste such as cassava skin, chopper straw, forage derived from weeds, or other carbon sources. This community service activity was covered by the local mass media Situbondo. Mass media coverage of this program can be accessed at <https://situbondonews.sigapnews.co.id/pendidikan/sn-56462/belasan-mahasiswa-berikan-sosialisasi-dan-edukasi-kepada-petani-dan-peternak-di-desa-wonorejo>.



Figure 4. Delivery of organic fertilizer production facilities: (a) Goat feces grinding machine and sack sewing machine; (b) Sprayer EM4

The handover of the goat manure grinding machine and sack sewing machine can be seen in Figure 4. Thus, it is expected that the production process will be more effective and efficient.

3.3. Extension Program

Agricultural extension is a learning process for farmers and their families and other agricultural business actors so that they know, want, and can help and organize themselves to access markets, agricultural technology, and capital to increase farm production, efficiency, business effectiveness, and family income. As one of the empowerment efforts, an extension must also include elements of community empowerment, including the accessibility of information technology, involvement/participation of key actors in development, organizational capacity in the form of the ability to work together, organize community members and mobilize resources to solve the problems faced (Bahua, 2015).

Hybrid Extension on Goat Faeces Organic Fertilizer

The hybrid extension was held on Saturday, July 15, 2023, with the aim of a hybrid extension. This program was very relevant because the range of participants is wider, easy to do, and the information provided can vary. It could even be that hybrid extension via the Internet can replace the function of extension workers because of the massive amount of information provided (Sirnawati, 2020). The hybrid extension recording can be accessed at <https://youtu.be/sxVFOUwYDJU> (Figure 5).

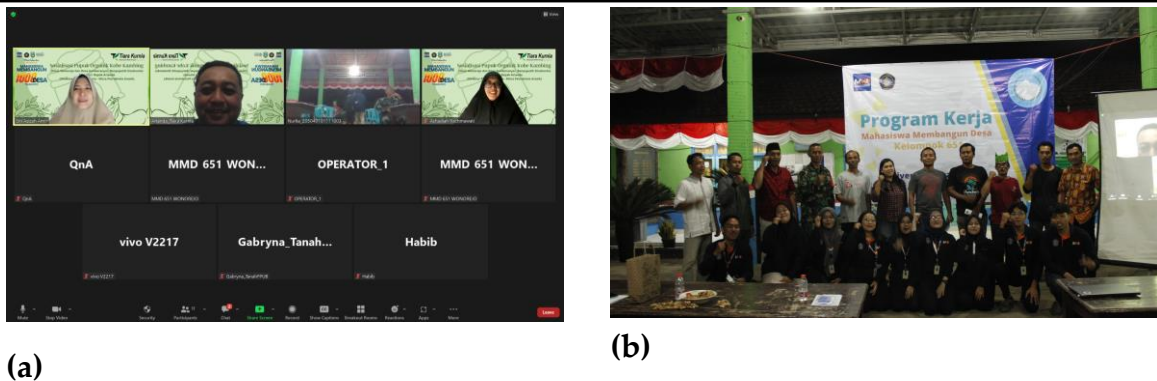


Figure 5. Hybrid Extension: **(a)** Online extension through Zoom Meeting; **(b)** Offline extension through face-to-face

Hybrid extension stated by Gitosaputro & Listiana (2018) is an extension that utilizes internet networks, communication through computers, and digital interactive multimedia to bridge the process of the rapid transformation of new science and technology in agriculture. Figure 5 shows the extension process by using Zoom meetings to present speakers from PT. Tiara Kurnia Director was a speaker, along with an offline extension that was attended by village officials, goat breeders, farmers, and local BABINSA (*Bintara Pembina Desa/Village Development Officer*).

The hybrid extension is adjusted to the conditions of learning participants in Wonorejo Village while overcoming the limitations of distance and space between participants and speakers. According to (Azizah (2023), an extension program planner must understand several things in the use of digital media, such as interests, learning styles, and socioeconomic conditions of students. Sometimes the role of a teacher is needed if the conditions of students are heterogeneous. Especially if teaching and learning activities are not formal education but non-formal education whose students have different individual characteristics, learning adjustments with the help of information technology must be made so that the needs of each individual are accommodated.

The *Soponyono Kendal* Farmers group showed improvement in their knowledge about producing and marketing organic fertilizers. The DM Team did a brief interview about the extension learning outcome. Some of the increased knowledge gained by farmers is: how to produce organic fertilizer correctly and not cause failure due to wrong composition; how to promote good products with correct packaging and the importance of legality in organic fertilizer production.

NIB (Nomer Ijin Berusaha)/BIN (Business Identification Number) Assistance

Assistance in making a NIB/BIN (Business Identification Number) was carried out to strengthen the legality of organic fertilizer products produced by *Soponyono Kendal* Farmer Group in Figure 6. It is shown that the process of making this BIN has been successfully carried out. According to the Regulation of the Investment Coordinating Board of the Republic of Indonesia, Number 1 of 2020 concerning Guidelines for the Implementation of Electronic Integrated Business Licensing Services, BIN or Business Identification Number is the identity of Business Actors in business activities. It is valid while carrying out business activities by the provisions of laws and regulations. BIN is proof of Investment/Business Registration which is also an endorsement of the Company Registration Certificate, customs access rights, and proof of fulfillment of the first report on the obligation of the Manpower Report in the Company (WLKP/Wajib Laporan Ketenagakerjaan Perusahaan).



(a)



(b)

Figure 6. Making BIN *Soponyono Kendal* Organic Fertilizer: (a) Submission of BIN by MMD students; (b) BIN *Soponyono Kendal* Organic Fertilizer

Auliyah & Legowo (2022) stated that BIN has a business legality function; BIN is also intended to collect MSME data digitally for later use in programs to support the development of MSMEs. With the BIN, organic fertilizer made by the *Soponyono Kendal* farmers group can be more easily marketed and participate in MSME programs organized by the government, academics, and private parties.

4. CONCLUSION

The implementation of MMD 1000 Village Grant Community Service is a collaboration between academics (Community Service Team and MMD participating students) with the *Soponyono Kendal* farmers group, village government, and PT. Tiara Kurnia has been successfully done. The objectives of the program targets have been achieved, among others: increasing farmer knowledge and improving the quality and quantity of organic fertilizers with extension and assistance with production facilities. The legality of organic fertilizer production through BIN has also been achieved. The recommendation for future community programs is to increase community knowledge and perception to increase the demand for organic fertilizers. The quantity improvement of organic fertilizers is especially in the value of C/N 7.

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