Strengthening The Product Development Of Straw Mushroom To Enhance The Welfare And Sustainable Development Goals In Wonokerso, Malang

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Abstract.

Sustainable development is a common goal of countries in the world, including Indonesia. In the process of its realization, sustainable development Goals or SDGs have an impact on various aspects of life, including overcoming food security problems. To achieve the SDGs, the participation of many parties is necessary. The form of community participation can be achieved by conducting training or counseling activities in the product development of local potential commodities, one of which is the mushrooms. Paddy straw mushroom is one type of mushroom that has a high protein content and is low in calories. Through capacity building in Wonokerso Village, Pakisaji, Malang Regency, we expect to be able to increase participants' skills and insights about the straw mushrooms product development in order to develop jobs in achieving sustainable development goals. Participants not only strengthen their mushroom product development skills but also increase their knowledge in preparing the media for cultivation. Participants were very enthusiastic because the theme conveyed in the activity was very relevant, it is hoped that with this activity participants can increase the ability and understanding of the community to cultivate straw mushrooms to be sold in various urban areas through business partners. In the activities that have been carried out, the final assessment results of training showed high knowledge about the cultivation of straw mushrooms compared to the results of initial knowledge and obtained sustainability analysis to provide advanced training in the cultivation of paddy straw mushrooms in the post-harvest process.

Keywords: *Straw Mushroom, SDGs, Food Security, Community Participation and welfare.*

I. INTRODUCTION

Wonokerso Village, Pakisaji District, Malang Regency is a straw mushroom producing village in East Java. Located on the southern main route of Malang, Wonokerso Village, Pakisaji is a strategic area to be accessed by both tourists and investors. Wonokerso Village is located at a height of 460 meters above sea level with an average temperature of 250 celcius so that it has fertile soil conditions and is suitable for use in agricultural areas including crop cultivation. On the other hand, Wonokerso Village also has special characteristics of industrial estates as evidenced by the existence of various business potentials including the cultivation of straw mushrooms to livestock products (1). Mushroom farmers use rice husk waste as a medium for planting straw mushrooms, making the cultivation of straw mushrooms a local business of the local community (2).

This is because planting media using rice husk waste gives better results on the growth of straw mushroom plants when compared to other growing media (3).Judging from the local potential in the form of mushrooms will be very pomising if developed with the right strategy. Efforts to create a strategy for developing mushroom products are needed so that the cultivation results are managed optimally. Especially if it is supported by the characteristics of Wonokerso Village residents who relatively maintain tradition and culture to actively participate in activities to advance the village. If the strategy of developing straw mushroom products is well realized, food security and sustainable development in Wonokerso Village can be achieved. Several forms of achieving sustainable development are evidenced by increasing population welfare, lack of unemployment and poverty, to improving the health conditions of Wonokerso Village residents(4).

Fig 1. Wonokerso Village Office

Mushrooms are rich sources of nutrients and have large portions as health foods (5). Mushrooms *Volvariella Volvaceae*) have a high nutritional content, one of which is more mineral content when compared to beef and lamb (6). In addition, the protein content of mushrooms is also higher than other plants (7). Straw mushrooms have a fairly complete nutritional content including carbohydrates 8.7%, protein 26.49%, potassium 44.2%, calcium 0.75%, phosphorus 30%, fat 0.67%, and also vitamins (8). Straw mushrooms which are a potential commodity in the local tropics will be increasingly known to the general public if strategies are carried out in the development process (9). High nutritional content and as a potential local commodity, the production of straw mushrooms not only helps in accelerating the achievement of food security but also sustainable development (10). Food security is a complex issue involving socio-economic, political, and environmental aspects (11). Through the development of mushroom products, it can contribute to improving nutrition and as a healthy food, especially for people who undergo gluten and calorie diet programs (3).The implementation method carried out in this community empowerment activity uses focuss group discussin (FGD) techniques and direct counseling related to the cultivation of mushrooms (12).

This activity was carried out in several stages of activities, starting with the field survey stage with the aim of extracting information about health problems that often occur, especially during the current transition season, then continued with the selection of FGD targets and training, namely selecting groups of villagers who have businesses and well-informed villagers who are starting businesses. After the selection of the target audience, the next stage is to take care of extension permits, prepare materials and tools for derivative products of mushroom cultivation, prepare presentation materials, prepare questions, and prepare supporting infrastructure for activities. The population and sample of this workshop were chosen because they reviewed the suitability of well-informed training partner village communities or cultivation pioneers. Mushrooms are a commodity that is rich in benefits, one of which is as a food rich in protein and vitamins. Straw Mushroom *(Volvariella Volvaceae)* is a high nutritional content, one of which contains more minerals when compared to beef and lamb (13). These mushroom seeds are found around the neighborhood of Wonokerso Village, Malang Regency. Tools needed in training the cultivation of straw mushrooms include trowel gloves, scissors, and water spray bottles. While the materials used are mulch plastic, molten mushroom seeds, dolomite lime, straw / husk charcoal, and water. The data collection technique used in this workshop is the test method. The test method consists of two types, namely pre-test given before material exposure and post-test given after material exposure.

II. RESULT AND DISCUSSION

2.1 Exposure of Straw Mushroom Cultivation Material

On August 9, 2023, socialization activities were carried out to the people of Wonokerso Village, Malang Regency. On this day, the opening was held by the chief researcher, Mr. Ahmad Fawaiq Suwanan, and continued with welcome and thanks from Mr. Nariyadi as the Head of Wonokerso Village. The opening explained the series of socialization activities and FGDs which will be held for two days, August 9-10, 2023.

1(a) 1(b)

Fig 1(a). Opening of the event by the lead researcher and distribution of pretest

Fig 1(b). Welcome and thank you from Wonokerso Village Head, Pakisaji

The opening activity continued with pretest filling by 19 selected residents in Wonokerso Village, Malang Regency. Pretest is used to determine the level of initial understanding of respondents about the material to be delivered during socialization activities and FGDs.After the pretest filling activity by respondents, then the material delivery by the pioneer of the straw mushroom business, Mr. Taufan, at 10.00 WIB. The material presented by Mr. Taufan was related to the definition and use of mushrooms, the reasons for cultivating mushrooms, tips on cultivating mushrooms, the ingredients for cultivating mushrooms, explanations of cultivation with beetles and without mushroom beetles, how to cultivate herbs, things that need to be considered when cultivating mushrooms, and post-harvest handling.

Fig 2. Material explanation by Straw Mushroom Practicioner

2.2 The second activity will be on August 9, 2023

After an explanation of the material from Mr. Taufan, it was continued with the practice of cultivating straw mushrooms by Mr. Taufan in the form of initial steps of cultivation to an explanation of what must be done in the cultivation of straw mushrooms.

Straw mushroom cultivation

The activities of cultivating straw mushrooms and the presentation of the steps of cultivating mushrooms were explained by Mr. Taufan. The first step is to prepare a beetle or mushroom house used for cultivation.

Fig 3. First Steps of Straw Mushroom Cultivation

The place or container used because without a beetle is replaced with a net parcel box without a lid. Where the use of this box is considered more practical for community use, especially for those who do not have room to make beetles. After that, the preparation for providing equipment maintains the temperature

and humidity of the beetles. The second step in this cultivation if without using a beetle is to use a box parcel to maintain the humidity of the beetle does not need to be done. After this step, begin to prepare the straw mushroom nursery by maintaining the room temperature of 32-35 degrees Celsius. The fourth stage, is the preparation of planting media. The planting medium used is straw planting media that has been soaked with water for 1-3 nights.

Fig 4. Fourth Step of Making Planting Media with Straw

In this fourth step, straw planting media is placed in a parcel box on the bottom layer and added up to 1/4 of the parcel box space. Straw planting media is considered better to use because it is a substitute for urea fertilizer containing chemicals. After the straw planting medium is placed on the parcel box, it is followed by sprinkling dolomite lime on top of the planting media. Sowing dolomite lime is spread as needed and not too much.

Fig 5. Sowing of Dolomite Lime in Growing Media

The next step is the stocking of seedlings of molten mushrooms. The selected straw mushroom seeds are fresh and good mushroom seeds and there is no white-and-white on the seedlings. The resistance of mushroom seeds that are still good for a maximum of 1 month with conditions is still good to be developed.

6 (a)

6 (b)

Fig 6 (a). seeds of straw mushrooms that are each good and fresh to be developed

Fig 6 (b). the process of stocking mushroom seedlings in planting media containing straw and dolomite lime.

After stocking the seeds of the straw fungus, then the closure is carried out with the straw planting medium again which is half dry or still wet. If you want to use rice husks, it is better to dive for 3 days and 3 nights and will accelerate the growth of straw mushrooms overnight. The mushroom will grow on the sidelines of straw or planting media on the parcel box.

Fig 7. Cover with Straw Planting Media

After covering with straw planting media, dolomite lime is then sprinkled again to remove nutrients in the straw. Next, the parcel box container is closed using black silver mulch plastic. The upper part on the black color while the lower part on the silver color. The function of the position of the mulch plastic with black color above is to absorb sunlight so that it can enter. Mulch plastic does not need to be covered and attached as a whole because it can produce carbon dioxide substances that cause toxins to the body.

Fig 8. Parcel Box Closure with Black-Silver Mulch Plastic

Things that need to be considered in the cultivation of straw mushrooms using parcel boxes and straw planting media are spraying water at any time when the condition of the growing media feels dry. Box parcels for cultivation can only be used in one layer of straw mushroom seeds. The parcel box is placed in a warm and humid room. Mushrooms can be harvested after 10-12 days.

2.3 FGD Activities on August 10, 2023

The socialization activities that occurred on August 9, 2023 were closed and continued at the FGD on August 10, 2023. In this case, the reopening was carried out by the chief researcher, Mr. Ahmad Fawaiq Suwanan, S.E., M.Si. and continued with the delivery of material by Mr. Dr. Rizky Firmansyah. The opening on the second day conveyed reinforcement about good straw mushroom cultivation strategies. If on the previous day it was explained related to the direct practice of cultivating mushrooms, then on the second day it was emphasized on entrepreneurship material and what strategies can be done if you want to do a variety of mushroom cultivation.

2.4 Straw Mushroom Cultivation Strategy in Improving Community Welfare Towards SDGs

The next activity at 10.00-11.00 was an explanation of the material on the strategy of cultivating straw mushrooms from the entrepreneurial side by Mr. Dr. Rizky Firmansyah.

Fig 9. Material Explanation by Dr. Rizky Firmansyah

The first strategy that can be done by the community in cultivating mushrooms is to assess the feasibility of the resulting mushroom products (14). Before carrying out development on the results of the cultivation of molt mushrooms. First, the community must ensure the feasibility and quality of the mushrooms produced (15). Whether the mushroom is safe for consumption, whether it has been successfully developed, and whether it has appeal to customers, what resources are used in the production of the mushroom (16). If all of these are met, the community can distribute it to suppliers. Furthermore, if the elements of production feasibility are not met, an evaluation is carried out first for business continuity. Appropriately, carrying out production and cultivation must have experienced crop failure. These things should be of better concern to the trial and error community by producing a little to observe whether the mushrooms produced are successfully harvested. The second strategy is the analysis of distribution channels and intended consumers. In this case, distribution channels can partner with mushroom distributors in urban areas (17). Villagers who want to facilitate marketing first analyze the presence of colleagues or business people in the city who can be a channel for distributing the results of mushroom cultivation. Sometimes the analysis of distribution channels goes unnoticed because society is focused on developed cultivation. Doing business partners with suppliers certainly facilitates distribution channels. At present, it is not easy to distribute the results of the cultivation of straw mushrooms directly to consumers. Considering that consumers today are more critical in assessing a product to be consumed. Villagers can first build partners with vegetable vendors in urban areas or mobile vegetable vendors.

It would be better, if the quality of mushroom products is able to enter the distribution channels at the level of supermarkets and minimarkets. What if you do not have a business partner for the distribution of mushroom products? So, what can be done is to sell your own mushroom products in urban areas. However, of course this is a high risk of failure and non-profitability (18). So, business partners with suppliers are important for straw mushroom cultivators to get to the final consumers who are the target of sales.The third strategy is product packaging. This third strategy is the basis of sales. The results of the cultivation of straw mushrooms do not become unique and attractive when only wrapped using black plastic. Therefore, it is necessary to create a packaging strategy that attracts consumers (19). Consumers can use thick white plastic packaging instead of black crackles that look unattractive. In addition, people can use thick plastic crates with lids on them that attract consumers. Currently what is famous in the community is the *packaging of standing pouches* with *zipper* covers on it. Mushrooms can be packaged and have high selling value if using the right packaging. People who are new to producing mushrooms can choose white packaging plastic to reduce new production costs using plastic containers if there is an increase in sales figures. Furthermore, the production of straw mushroom cultivation products can adjust to the intended distribution channel. If it is at the same level in the supermarket and minimarket channels. Producers of straw mushroom cultivation products can use *standing pouch* packaging that is more elegant and contemporary and supports environmentally friendly concepts (20).

The fifth strategy is promotion and marketing. Promotion and marketing strategies are the main strategies that are important to pay attention to. Why is that? This is because good promotion and marketing will further increase consumer attention to buy. Producers of mushrooms are required to follow the latest trends (21). As is well known, the majority of consumers choose to buy imported mushroom products on e-commerce platforms and supermarkets (22). Of course, manufacturers must be able to adapt to digitalization like this. In addition, in terms of promotion and advertising, producers must also be able to adjust the preferences and tastes of consumers who currently prefer the TikTok or Instagram Reels applications. Using the TikTok platform is the latest product promotion trend that is being loved by young people or young housewives. So, producers must be able to adjust and determine the right promotional and marketing media in marketing the production of mushrooms.The sixth strategy is a derivative product development strategy. This strategy is an advanced strategy of cultivating mushrooms. After fulfilling the five strategies above and creating branding or labels, it can be continued to the sixth strategy to create products derived from mushrooms (23). Creating branding or labels needs to be the main concern before developing the results of mushroom cultivation into derivative products.

Giving a unique and attractive first impression to consumers creates labels in the community (24). For example, if in Malang the meatballs known are presidential meatballs even though the better meatballs are elsewhere. Branding or labeling of meatball products can be applied to the production of molten mushrooms. For example, the FGD participant here named Ibu Susi produces straw mushrooms with high quality and the best compared to imported mushroom products. Ibu Susi uses the Straw Mushroom branding "Sae" if the branding is successfully created, the community and consumers will label trust when buying mushrooms and choosing Ibu Susi's products. The success of this branding was continued with the development of derivative mushroom products such as producing crispy mushrooms, canned mushrooms, straw mushroom flour, and anchovy mushroom sauce.This mushroom product development strategy if continued will generate high profits and profits in the mushroom cultivation business. When the whole can be fulfilled, consumers and the national and international community will label Wonokerso Village as a reference village for national mushroom cultivation. So it is difficult, of course, this will benefit the welfare of the village community itself and even increase the achievement of regional and national SDGs.

2.5 Second Activity on August 10, 2023

The next activity at 11.00-11.30 the community filled out a posttest related to the entire series of FGD activities and service that lasted for two days. The community was asked to fill out a posttest to assess the extent of the final understanding of respondents and participants during FGD activities and training on mushroom cultivation.

Fig 10. Posting Poststest by Wonokerso Village Community

2.6 Closing

This first period of FGD and training activities closes at 12.00 pm on August 10, 2023. The FGD and training activities in Wonokerso Village, Pakisaji ended with a group photo session between participants and the LPPM Universitas Negeri Malang research team.

Fig 11. Photo with LPPM UM and Wonokerso Village Training Participants

The training on straw mushroom cultivation in Wonokerso Village implicitly aims to accelerate food security and national SDGs. The FGD and training participants consisting of 19 people are expected after participating in this to be able to practice directly cultivating mushrooms. The LPPM research team can provide an assessment regarding the determination and desire of FGD participants in cultivating straw mushrooms sustainably. Although after the FGD activity, participants will not directly practice cultivating mushrooms, but at least a desire or impression on FGD participants that this training activity is able to

provide motivation, improve *skills* / abilities, and increase public insight regarding the benefits of mushroom cultivation.At the time of the service implementation, pretest and posttest activities were carried out. Pretest activity where the distribution of questionnaires that must be answered by FGD participants regarding matters of cultivating straw mushrooms and perceptions of doing business partners. Furthermore, a postest was carried out where participants were asked to answer 15 similar questions from the previous pretest to determine the level of understanding and absorption of training material. On attendance the attached attendance list shows that the number of participants present is more than 75%.

Table 1. Pretest - Posttest Score Results

No	Name	Pretest	Posttest
1	Hariyono	55	71
2	Alvyola Gem Yusanto	65	68
3	Lukariyatin	52	72
4	Ali Suwarno	39	59
5	Moch. Alimni	57	75
6	Wahyudi Basuki	58	75
7	Sunarmi	50	71
8	Sukarti	60	60
9	Susiana	61	72
10	Priyanto	43	60
11	Alex	37	64
12	Hamim Saifuddin	59	75
13	Suyono	37	60
14	Mulyono	37	71
15	Ngateman	45	51
16	Rinoko	43	71
17	Great Praise Slamet	41	60
18	Gunawan	42	60
19	Ngatemo	66	66
Number of Values		**947**	**1261**
Average		**49.84**	**66.36**

Based on the results of the data above, it shows an increase in the average value of the people of Wonokerso Village after participating in training activities on cultivating mushrooms. The increase was 25% compared to the average pretest score. The change that occurred was an increase of 16 points from the original 50 points on the pretest to 66 points on the posttest. From the results of the table above, it shows that the respondents' pretest results have an average score of 50, which means they are included in the questionnaire with moderate scores. If the average respondent concludes, the people of Wonokerso Village have an understanding or initial knowledge of medium, not high or low straw mushrooms. In addition, the table above shows that the posttest results of the Wonokerso Village community have a high average or 66. This means that the FGD and training provided increase the understanding of the people of Wonokerso Village in cultivating mushrooms. The high value also shows that the village community has at least understood the series of cultivating mushrooms, the functional side of mushrooms, and tips on doing herbal medicine cultivation business.

III. CONCLUSION

There are two conclusions about sustainability from the results of this service. **First**, sustainability analysis from the side of FGD participants. FGD training participants provided sustainability advice for the LP2UM research team, namely developing training and courses to create products derived from molten mushrooms. It is based on the advanced program of cultivating mushrooms, people can develop derivative products such as ready-made and semi-finished foods from mushrooms. In addition, there are questions regarding the cultivation of straw mushrooms using containers from asbestos. The sustainability of the question is answered that it cannot be if you use asbestos materials if the outside environment is dry. The use of asbestos material as a beetle can be done in environments with soft conditions and rainy seasons.

Second, sustainability analysis from the side of the LP2UM research team for FGD participants. The LP2UM research team wants to continue collaborating with Wonokerso Village, Pakisaji to find out the sustainability of straw mushroom cultivation by amsyarakat. The hope is that with the creation of this communication, a deep relationship will be built between researchers and the intended partner villages. As is known from data analysis, the majority of FGD participants do not come from entrepreneurial or self-employed backgrounds. So that the sustainability of this training is needed in order to achieve the goal of strengthening the entrepreneurial capacity of rural communities in supporting sustainable development (SDGs) in Wonokerso Village, Pakisaji, Malang Regency.

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