

Transfer of Technology to Utilize Tumbu Sugar by-Products as a Medium for White Oyster Mushroom Plants to Improve the Creative Economy of Kandangmas Village

Zulfikar Rafi Nurcahyandi ¹, Erly Nurviyani ², Andre Widiatmoko ³, Pria Jaya Permadi ⁴,
Jayanti Putri Purwaningrum ⁵

Pendidikan Matematika,
Universitas Muria Kudus, Indonesia

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ABSTRACT

This community service is motivated by a large amount of waste from the by-products of tumbu sugar in Kandangmas Village reaching 6 tons per day. The bagasse waste is only burned and landfilled without being used, this causes environmental pollution in Kandangmas Village and until now there has been no solution to reduce the waste. The purpose of this community service is to utilize the by-products of tumbu sugar in making white oyster mushroom backlogs. and knowing the economic improvement of partners during the mushroom cultivation and processing of white oyster mushroom products. The method applied is Participatory Action Research (PAR). Data collection used includes interviews and document analysis. Based on observations, it is known that the percentage of fungal growth in beetles reaches 95%. The resulting mushroom has good quality, it is characterized by white mushrooms, heavy bots, and a wide diameter. Post-harvest oyster mushroom handling is processing and marketing. Currently, residents already have around 20 processed mushroom menus which are sold at the Aosy Lady Mushroom Lapak and market online as well. This shows that the training and mentoring from this community service activity have succeeded in increasing the knowledge and understanding as well as the community's economy related to the technical cultivation of white oyster mushrooms. In further activities, the ORMAWA HIMATIKA UMK PPK Team plans to conduct more intensive assistance and motivate the Environmental Care Plantation Community Group to become a mushroom center village and the only mushroom education village in Kudus Regency.

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Corresponding Author:

Zulfikar Rafi Nurcahyandi
Universitas Muria Kudus

INTRODUCTION

Indonesia is an agricultural country that has a diversity of agricultural commodities ^[7]. This diversity is a potential that can be developed in the agricultural sector, one of which is the horticulture sector. The agricultural sector in Indonesia is important in national economic growth. Most of Indonesia's population lives in rural areas and more than half of the population depends on agriculture. The development of the agricultural sector is not only food crop commodities, but also plantation crops and horticulture. Horticultural products provide benefits for humans, including as a source of food and nutrition. One of them that has a contribution to humans is fungi ^[9]. Mushrooms are one of the horticultural sectors that currently have a very large

opportunity to be developed in the world of economy. The number of people's need for mushrooms continues to increase much higher than the availability of goods in the market ^[7].

According to Rosa et al at first, the fulfillment of human needs for the consumption of mushrooms only relied on the generosity of nature ^[7]. In such a way, the number of mushrooms obtained is very limited and only in certain seasons. However, now information continues to develop until finally the mushroom can be cultivated independently without having to rely on natural conditions or certain seasons. However, mushroom production in Indonesia is only able to meet 50% of market demand both from within and outside the country. This condition opens up mushroom business opportunities including the sale of fresh mushrooms and processed oyster mushrooms such as (crispy mushrooms, mushroom nuggets, mushroom satay, mushroom meatballs, mushroom spring rolls, mushroom stews, and so on).

According to Mardiana dkk White oyster mushrooms are one of the commercial consumption mushrooms with high economic value and prospective as a source of income for farmers ^[5]. Oyster mushrooms have become the raw material needed to be processed into daily healthy food. In Indonesia, one promising business is mushroom cultivation, mushrooms have begun to be known in recent years by the public as a healthy lifestyle making various kinds of mushroom culinary variants that cause increased demand for mushrooms ^[4]. Mushroom cultivation can be carried out simply on a household scale. The tools used are easy to get and the price is affordable. In addition to the mushroom cultivation business, the mushroom processing business is also very promising. With small capital and creativity in processing, this business can be an opportunity to get large profits ^[7].

Kandangmas Village is one of the developing villages in Dawe District, Kudus Regency, and one of the assisted villages of Muria Kudus University in the Village Development Program. Overall the area of Kandangmas Village is 1,291,892 m². With the northern border bordering Cranggang Village, the southern part bordering Rejosari Village, the eastern part bordering Pati Regency, and the western part bordering Lau, Rejosari. The location of the area has a large area of land making Kandangmas Village one of the villages that has potential in the fields of industry, agriculture, tourism, and the economy. One of the agricultural potentials in Kandangmas Village is dominated by the largest tumbu sugar-producing factory in the Kudus Regency. Based on observations that have been made waste waste from the by-products of tumbu sugar in Kandangmas Village reaching 6 tons per day, this information is quoted in the 2023 Kandangmas Village pantura-UMKM journal. The bagasse waste is usually only burned and landfilled without being used properly, this is what causes environmental pollution in Kandangmas Village until now there has been no solution to reduce the waste.

Running from these problems, a solution was obtained that could help the problem of environmental pollution in Kandangmas Village, namely by utilizing bagasse waste as an innovation in making white oyster mushroom blogs. Sutarja stated that in Indonesia, white oyster mushrooms are generally grown on wood sawdust media. However, the availability of sawdust is a limiting factor in the cultivation of white oyster mushrooms. If there is no wood sawdust, the cultivation of oyster mushrooms cannot be developed properly. Therefore, it is necessary to look for alternative media that are widely available and easy to obtain. One media that can be used as an alternative is the by-product of tumbu sugar ^[5]. In addition, according to Machfudi et al, the addition of nutrients through the by-products of sugar tumbu or bagasse is one of the efforts to be able to help increase the production of white oyster mushrooms ^[4].

Bagasse is a residue from the milling process of the sugarcane plant *Saccharum officinarum* L. after taking its potential sap. Based on the fiber component, bagasse contains 84% of the cell wall consisting of cellulose 40%, hemicellulose 33% and lignin 11%. Treatment with the addition of bagasse waste can increase the number of fruit bodies and wet weight of oyster mushrooms, thus having a good influence in increasing oyster mushroom production ^[3]. Bagasse contains water, sugar, fiber, and microbes, so when stacked it will undergo fermentation that produces heat. ^[1]. The addition of bagasse to conventional growing media is effectively used as a growth medium for oyster mushroom cultivation. The nutritional content needed by oyster mushrooms is more easily absorbed in bagasse media than in sawdust media affects the growth speed of oyster mushrooms and affects the physical quality and nutritional content of oyster mushrooms ^[8].

Based on the above problems, the author through the PPK ORMAWA HIMATIKA UMK program is interested in carrying out community service activities entitled "Transfer of Technology for the Utilization of Tumbu Sugar By-Products as a Media for White Oyster Mushroom Plants to Increase the Creative Economy of Kandangmas Village". The purpose of the community service is to find out the use of tumbu sugar by-products in making white oyster mushroom backlogs. and knowing the economic improvement of partners during the mushroom cultivation and processing of white oyster mushroom products.

METHODOLOGISTS

Community service carried out by the PPK ORMAWA HIMATIKA UMK team applies the Participatory Action Research (PAR) method. The PAR method is a community empowerment approach that involves the community in the process of activities carried out and finds practical solutions to common problems and issues that require joint action and reflection. Participatory Action Research is one research model that looks for something to connect the research process to the process of social change [6]. The social change in question is manifested in three benchmarks which include a joint commitment with the community, the existence of local leaders in the community, and the existence of new institutions in the community that are built based on needs. The PAR method in community service is expected to optimize the participation of independent farmers, the Kandangmas Village PKK group, the Kandangmas Village Fatayat group, and the Kandangmas Village Community to be able to increase the productivity of white oyster mushroom cultivation.

The stages carried out are as follows: First, the service team identifies the problems experienced by business actors. After the problem has been identified, in the second step the service team assists and together facilitates dialogue and reflection to find the right solution to overcome the problem. The third step is for the service team to carry out joint practice activities in making blogs with mixed ingredients of tumbu sugar by-products.

The PAR approach does not have a standard technique for data collection so that researchers can innovate creatively in developing techniques according to their needs [2]. There are two data collection techniques used including interviews and document analysis. The interview is a question-and-answer activity conducted by the interviewer and involves one or more sources. The interview was conducted offline. This interview activity was carried out to explore information known by the source. In addition, this interview was also conducted to obtain data on the obstacles that have been felt by white oyster mushroom farmers during their cultivation so that the service team can identify problems that occur in the cultivation of white oyster mushrooms. As for document analysis, this technique is used to collect and analyze data on documents relevant to the problems faced by white oyster mushroom farmers as well as the environmental innovations they carry out. The analysis is carried out by identifying various types of key information contained in the document.

RESULTS AND DISCUSSION

This community service activity was carried out in Kandangmas Village, Dawe District, Kudus Regency. Kandangmas Village was chosen as the location for Community Service activities by the PPK ORMAWA HIMATIKA Universitas Muria Kudus (UMK) team because it was for the sake of ease of intensive communication between the HIMATIKA UMK team and the Kandangmas Village community group. This is because this service activity is the second year since 2022. This community service activity is targeted at the PKK and Fatayat groups of Kandangmas Village, Dawe District, Kudus Regency. The number of the two groups amounted to 25 people divided into 3 divisions, namely the cultivation, processing, and marketing divisions. In the cultivation division, activities were carried out in the form of training and assistance related to the use of sugarcane frond waste which was used as a planting medium for white oyster mushrooms.

The training activities carried out were in the form of the application of technology to use the by-products of tumbu sugar as a medium for planting oyster mushrooms, cultivation methods, to post-harvest handling in the community in Kandangmas. Training and mentoring activities are carried out from July to November. The target group was given a sugarcane frond chopping device as a medium for cultivating oyster mushrooms



Training and assistance in the use of tumbu sugar by-products as a planting medium for oyster mushrooms builds public awareness about the use of sugarcane fronds which were originally only waste that could cause environmental pollution into something more useful.

The implementation of training on the use of sugarcane fronds as a growing medium for oyster mushrooms began with socialization about the benefits of white oyster mushrooms. White oyster mushrooms are a healthy side dish ingredient because they contain vegetable protein, vitamins, and minerals, and are free of fat and cholesterol. Knowledge about the benefits of white oyster mushrooms will increase public interest in consuming them. In addition, the use of sugarcane fronds can reduce the amount of waste that can pollute the environment. This is intended to increase the economic growth of residents because the waste that is left scattered is converted into goods that have benefits and high selling prices.

The first stage of training and mentoring is the creation of a simple beetle. Beetles are made from ribbed and bamboo poles, tarpaulin walls, and asbestos roofs that are tightly closed so that light does not enter because the intensity of too much sunlight will affect/inhibit the growth of oyster mushrooms.

The second stage of training and mentoring is the application of the method of shredding sugarcane fronds into powder with a shredding machine. Assistance in making media initially experienced difficulties, several times there were repeated fillings due to broken bags and non-uniform size/weight and shape. However, thanks to the perseverance of the HIMATIKA team in guiding, the partner community group managed to make a baglog well. The next step is to utilize the media / baglog, this is done to kill microorganisms that can germinate white oyster mushrooms. Sterilization takes quite a long time about 6-8 hours.

After the mushroom media has finished sterilizing, the next step is to do seedlings by planting mushroom seeds on baglog media. In this nursery section, cleanliness is the main key. The place, tools, and people on duty must be ensured clean. Requires a closed room for better results. One bottle of mushroom seeds can be used for 50 baglogs or more, but it can also be less than that. Depending on the seedling medium used. The seeds we use are king oyster mushroom seeds where king oyster mushrooms have a larger weight and fruit size compared to ordinary white oyster mushroom seeds. King oyster mushroom seeds were obtained from our team members who developed king oyster mushroom seeds at the tissue culture laboratory of Muria Kudus University.

Based on observations, it is known that the percentage of fungal growth in beetles reaches 95%. This increased the interest of residents in cultivating oyster mushrooms. In addition, it also shows that training and mentoring on the use of sugarcane fronds as a growing medium for oyster mushrooms have succeeded in increasing participants' knowledge and understanding of and economy related to the technical cultivation of white oyster mushrooms.

Guidance on mushroom harvesting is focused on the right ways, namely by looking at the criteria for mushrooms worthy of harvesting, how to harvest, and how to pack well so that not many mushrooms are damaged. The resulting mushroom has good quality, it is characterized by white mushrooms, heavy bots, and wide-diameter

Post-harvest oyster mushroom handling that needs to be done is processing and marketing. Marketing of oyster mushrooms can be done by selling them in fresh form. Besides being sold freshly, residents sell it in the form of ready-to-eat processed products. Currently, residents already have around 20 processed herbal menus including crispy mushrooms, mushroom satay, mushroom nuggets, mushroom meatballs, mushroom polish, mushroom mercon tofu, mushroom spring rolls, and many more. Residents usually sell products around the Logung reservoir where the logung reservoir is a tourist destination in Kudus Regency which is quite crowded. In addition to the logung stall, residents also sell at the Asoy Lady Mushroom Lapak and market online.

In further service activities, the ORMAWA HIMATIKA PPK Team plans to conduct more intensive assistance and motivate the Environmental Care Plantation Community Group to become the only mushroom center village and mushroom education village in Kudus Regency.

CONCLUSION

Training and assistance in the use of tumbu sugar by-products as a planting medium for oyster mushrooms builds public awareness about the use of sugarcane fronds which were originally only waste that could cause environmental pollution into something more useful. The seeds we use are king oyster mushroom seeds, where king oyster mushrooms have a larger weight and fruit size compared to ordinary white oyster mushroom seeds. Based on observations, it is known that the percentage of fungal growth in beetles reaches 95%. The resulting mushroom has good quality, it is characterized by white mushrooms, heavy bots, and a wide diameter. Post-harvest oyster mushroom handling that needs to be done is processing and marketing. Currently, residents already have around 20 processed mushroom menus, and are sold at the Asoy Lady Mushroom Lapak and market online as well. This shows that training and mentoring on the use of sugarcane fronds as a growing medium for oyster mushrooms has succeeded in increasing knowledge and understanding

as well as the community's economy related to the technical cultivation of white oyster mushrooms. In further service activities, the PPK ORMAWA HIMATIKA UMK team plans to conduct more intensive assistance and motivate the Environmental Care Plantation Community Group to become the only mushroom center village and mushroom education village in Kudus Regency.

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