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Organic Vegetable Business Empowerment of Hijau Daun Farmers Group, Karang Rejo, North Metro

Pemberdayaan Usaha Sayuran Organik Kelompok Tani Hijau Daun Karang Rejo Metro Utara

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Abstract

The excessive use of chemicals for vegetable cultivation in Karangrejo, North Metro threatens the sustainability of agriculture. The high control of pests, weeds, and labor costs causes farmers to use chemicals and doses tend to increase, which poses a risk to consumers. PKM objectives: 1. Organic cultivation, 2. Training on post-harvest innovation on washing, packing, labeling, and packaging variations. 3. Variations of processed organic vegetables: ice cream and nuggets. 4. Development of offline and online marketing. Activities during July-September 2022, to 15 members of the Hijau Daun farmers group, with assistance/training on organic cultivation, post-harvest with the application of Pumakkal Liquid Fertilizer Production of PT. Pumahitari University of Muhammadiyah Metro, making ice cream and vegetable nuggets, offline and online sales practices. Activity results: 1. Farmer groups know and are capable of environmentally friendly organic cultivation. 2. Able to make compost and liquid fertilizer and 9 types of vegetables obtained Prima 3.3 certificate. Able to make ready-to-cook packages, Hida ice cream, and nuggets and use the web.

Abstrak

Penggunaan bahan kimia budidaya sayuran Karangrejo Metro Utara yang berlebihan, mengancam keberlanjutan pertanian. Tingginya pengendalian hama, gulma dan biaya tenaga kerja menyebabkan petani menggunakan bahan kimia dan dosis cenderung meningkat. yang beresiko membahayakan konsumen. Tujuan PKM: 1. Budidaya organik, 2. Pelatihan inovasi pascapanen pencucian, pengepakan, pelabelan dan variasi kemasan. 3. Variasi olahan sayuran organik: es krim dan nuget. 4. Pengembangan pemasaran off line dan on line. Kegiatan selama Juli-September 2022, kepada 15 anggota Kelompok tani Hijau Daun, dengan pendampingan/pelatihan budidaya organik, paska panen dengan aplikasi Pupuk Cair Pumakkal Produksi PT. Pumahitari Universitas Muhammadiyah Metro, pembuatan es krim dan nuget sayuran, praktek penjualan off line dan on line. Hasil kegiatan: 1. Kelompok tani memiliki pengetahuan dan mampu budidaya organik yang ramah lingkungan. 2. Mampu membuat kompos dan pupuk cair dan 9 jenis sayuran memperoleh sertifikat Prima 3.3. Mampu membuat kemasan siap masak, Hida es krim, nuget dan memanfaatkan web.

Keywords: Hijau Daun, organic farming, Pumakkal, Hida ice cream.

1. Introduction

The use of chemical fertilizers and chemical pesticides plays a positive role in increasing crop yields and growth. However, the excessive application of inorganic fertilizers and chemical pesticides harms human health, and the environment and increases the cost of agricultural production. Pesticides are classified as Endocrine Disrupting

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Chemicals (EDCs), namely chemicals that can interfere with the synthesis, secretion, transport, metabolism, binding, and elimination of hormones in the body, one of which is thyroid hormone, Suhartono, 2014. Excessive application of pesticides also causes poisoning in 76,5% of farmers in Sumber Rejo Village, Ngablak District, Magelang Regency, Central Java Province, Yuantari, 2009.

Organic farming is known as the development of traditional farming science that has been done by humans, through the use of non-chemical materials. Modern organic farming is an agricultural cultivation system using natural ingredients and without the use of synthetic chemicals. The values of health, ecology, justice, and protection underlie the management of organic agriculture. Health applies the sustainability and improvement of the health of soil, plants, animals, earth, and humans integrated into organic cultivation because these components are interdependent and cannot be separated between their components. Organic agricultural products are attractive to producers and consumers because they do not use synthetic chemicals that pose a hazard to human health and the environment. Awareness of these dangers makes most consumers demand organic products to maintain body and environmental health. Lesmana dan Hidayat, 2008.

Pumakkal (Biang, starter in Lampung language) is a consortium of indigenous bacteria of Pineapple Liquid Waste (PLW), is a bacterium that has the potential to decompose and can be used as a starter in waste recovery, Sutanto, 2019. Pumakkal in addition to containing bacteria Bacillus careus, Acinobacter baumani, Bacillus subtilis, and Pseudomonas pseudomallei, Sutanto, 2020 also contains nitrogen, phosphorus, potassium as organic fertilizers.

The application of Pumakkal on vegetables for the Hijau Daun farmers group has the opportunity to produce environmentally friendly vegetables and cultivation. The aim of this service is 1. Training on organic vegetable cultivation, 2. Increasing awareness of farmer groups to grow vegetables that are safe for consumption with the principles of sustainable agriculture. 3. Assistance in the sustainability of the Hijau Daun Farmers Group, Karangrejo in processing and selling off and online.

Solutions and Outcomes Target

The solution to the problems above is to build awareness of the importance of organic vegetable cultivation so that it will ensure long-term health and sustainable farming systems. As a result of this service, farmer groups understand that the levels of chemical residues before and after the cultivation of organic vegetables are different, farmers believe that organic cultivation will reduce chemical residues and increase soil fertility. 2. Farmer groups can grow vegetables that are safe for consumption with the principles of sustainable agriculture. 3. Able to carry out various online and conventional vegetable processing and sales.

2. Result and Discussion

The service activity was carried out in July -October 2022, for 20 members of the Hijau Daun Farmers Group. The first stage was the socialization of activities to farmer groups, discussing the stages of activities including observation and survey of chemical residue levels in the pilot garden consisting of soil, water, and vegetable samples. The second stage is preparation for organic cultivation by preparing the land, making compost, planting, maintaining, and harvesting. After harvesting, various packaging, labeling, and processing of vegetables are carried out. The third stage is the socialization of cultivation management and marketing both conventionally and online. At this stage, the Prima 3 test is also carried out for the legality of vegetables. All stages are carried out with the principle of organic cultivation.

Figure 1. Meeting of the Service Team with the Hijau Daun farmer group, RT (Neighbourhood) and RW (Hamlet) administrators, and the village leader to socialize the service work program. (Doc. PKM 2022).

Figure 1. The results of the socialization agreed to carry out the service for four months. The service team provides assistance in organic cultivation, assistance in the manufacture of organic fertilizers with Pumakkal, and cultivation of

organic vegetables until post-harvest. Prima 3 vegetable certification, organic farming management, and marketing assistance. The service team prepared equipment, materials, and land rental as well as four experts with expertise in organic cultivation, quality assurance of organic farming processes and production, marketing techniques, and product legality along with ten umbrella research students and two internship students from PT. Pumahitari. Farmer group members participate in mentoring, training, and group cultivation.

Preparation for cultivation begins with renting land owned by residents and processing land. Preparation of water from drilled wells so that it is guaranteed free of contaminants, ensuring the land does not enter tertiary water which may have been polluted.

Figure 2. Land preparation and planting of seeds and initial liquid fertilizer are all controlled so that chemical residues are kept to a minimum. (Doc. PKM 2022).

Figure 2. shows that farmer groups are given an understanding of the importance of preparing land for processing land. Controlled irrigation so that the incoming water is free from residue, in this case, drilled wells are used. The perimeter of the land is given a barrier net for the control of plant-disturbing insects. Map land sizes that are affordable and easy to care for, watering and grooming paths allow farmers to pass easily. Composting provides an understanding of the importance of reducing chemical inputs in the soil. The initial stage is still using chemicals, only reduced to 30%, gradually reduced each time the harvest. Composting utilizes agricultural waste materials and livestock waste that is around the farmer group.

Figure 3. Composting using agricultural waste (leaves and fruit as biopesticides), livestock waste, husk charcoal, ash, lime, and Pumakkal starter and application of compost on land. (Doc. PKM 2022).

Based on Figure 3. The composting process is less than one month, every 10 days controlled by temperature, pH, and humidity. During control, if the water content decreases, it is watered and Pumakkal is added so that the fermentation process is optimal. The compost was successfully marked with no increase in temperature (stable at room temperature), pH 7-9 (neutral) humidity 70-80%. Farmers also get an understanding that various agricultural waste materials can be used for compost with a percentage of 30-40% plus ash and husk charcoal to maintain the porosity and soil moisture content, dolomite or lime serves to neutralize soil pH. The use of Pumakkal as a starter will make organic materials simpler and ready to be used by plants. The increase in nitrogen levels is thought to be caused by an overhaul of organic substances by the bacterium Konsosia B (10) consisting: Bacillus careus, Acinobacter baumanni, and Bacillus subtilis. Acinetobacter baumanni is dominant as a nitrifying bacterium that converts ammonia to nitrate at the end of the fermentation process. In addition, microorganisms also contribute several single-cell proteins obtained during the fermentation process, after the decomposition process is completed, nitrogen will be released again as one of the components contained in compost. Sutanto.2020.

Land preparation, seeding, and composting were completed followed by vegetable planting. There are 9 kinds of vegetables, namely: green spinach, red spinach, cassava leaves, choy sum, water spinach, basil, spring onions, bok choy, and lettuce.

Figure 4. Organic vegetable cultivation using the Pumakkal application in the village of Karangrejo 23, North Metro (Doc. PKM 2022).

Figure 4. Application of Pumakkal compost for land that is being used for the first time with a dose of 5 kg per square meter, vegetables is planted at a spacing according to the type of vegetables. Treatment includes watering 2-3 times a day/depending on the weather. The use of Pumakkal liquid fertilizer by spraying 1-2 times a week, a dose of 5-10%. Weed care by routine weeding, either with tools or manually pulled out. Pests and diseases use trapping plants (refugia), natural predators/ chameleons, and natural biopesticides, including chinaberry leaves and fruit, tobacco, sea mango fruit, PGPR from bamboo roots that have been mixed in Pumakkal liquid fertilizer. A biological agent is any organism that in all stages of its development can be used to control OPT (Plant Pest Organisms) in the production process, processing of agricultural products, and various other purposes (Marianah, 2015). One of the biological agents is Plant Growth Promoting Rhizobacteria (PGPR), which are bacteria that live in colonies on plant roots and increase plant growth. The mechanism of action of PGPR occurs through inhibiting the growth of soil-borne pathogens or increasing plant resistance to pathogens, Beneduzi et al., 2012.

Figure 5. Planting trapping flowers in addition to beautifying the garden is also useful for trapping pests that come. The chameleon is a natural predator to eat pests on vegetables. (Doc. PKM 2022).

Figure 5. Efforts to control pests and diseases are by using refugia plants or pest traps so that they are attracted to flower traps and lay eggs that hatch in flowers and do not enter vegetables. Maintenance of natural predators such as chameleons provides opportunities for pests/fleas, and leafhoppers to be eaten by natural predators.

Management of organic vegetable business to increase vegetable business and sustainably include:

a) Standard Quality of certified vegetables, for Karangrejo organic vegetables, eight types of vegetables have been certified. The vegetables are spinach, green beans, long beans, water spinach, cucumber, bok choy, mustard greens, and eggplant. Prima 3 certificate states that it is safe with pesticide residues below the threshold. Therefore, consumption of organic vegetables is calmer because they are healthy and safe, as shown in Figure 6.

b) Harvesting requires treatment, including washing running water so that dirt and E.coli can be kept to a minimum. Various packages, labels and are processed into Hida ice cream and vegetable nuggets, as shown in Figure 7.

c) Regarding post-harvest management, Hijau Daun farmers groups are given training for online sales. Facilities used with Tokopedia and Shoppie. The activity received a good response from the participants even though some were still not familiar with technology, as shown in Figure 8.

Figure 6. Prima 3 Certificate, stating that the vegetables are safe with pesticide residues below the threshold. (Doc. PKM 2022).

Figure 7. Efforts to improve vegetable quality by washing with running water, *tumpeng sari* (intercropping) cultivation system, packaging packaged with organic plastic and labeled, vegetables being processed into HIDA ice cream and nugget. (Dok. PKM 2022).

Figure 8. Sales off and online. Sales online Web features. https://hijaudaun.berdu.pw/ (Doc. PKM 2022).

Table 1. Results of PKM for the Hijau Daun Farmer Group Empowerment in Karang Rejo Metro Utara.

NO.	ASPECT	BEFORE	AFTER
	Knowledge, and understanding of organic cultivation	Limited about without chemistry	Organic includes tillage, soil, water, environment, fertilizer, seeding, planting, care, harvesting, and post-harvest to sales.
	Land preparation	Just hoe/rotary, get rid of weeds, manure, chemical fertilizers	In addition to what has been done, eradicate weeds without chemicals, compost manure with agricultural waste, dolomite lime (increase pH), and Pumakkal starter (accelerated fermentation) to reduce chemicals, and reduce chemical fertilizers by 30-40%.
	Nursery	Seeds without washing, pest control with chemical drugs	The seeds are washed, and the pests are controlled biologically (making biopesticides)
	Planting	Not paying attention to	Crop rotation and intercropping for

NO.	ASPECT	BEFORE	AFTER
		crop rotation and intercropping.	fertility and control of pests and diseases
	Maintenance	Extermination of pests and diseases with chemicals, not paying attention to refugia and natural predators. watering with splashes, and eradicating pests with interlocking tanks.	Suppressing chemicals up to 30%, planting refugia plants and keeping chameleons as natural predators, watering with a water pump so that it is labor efficient, and special water tanks for organic fertilizers.
	Harvest and Post-harvest	The washing water has not flowed, and there is no packing and labeling.	Washing with running water, packing vegetables, and labeling the Hijau Daun of Karangrejo.
	Marketing	Only offline, mostly rely on wholesaler	Offline and online using the Hijau Daun website; https://hijaudaun.berdu.pw/. It builds an online media network and joins the Pasar Argo Ceria of Metro City Government and Pojok Organik of Campus 1 UM Metro.
	Profit	Profit and loss have not been calculated	With a selling capital of Rp. 210,000, farmers earn 475,000 in the Pojok Organik of Campus 1 UM Metro.

Community service activities (PKM) that have been carried out in Karang Rejo 23A, North Metro, namely organic vegetable cultivation and marketing. Organic vegetable cultivation is the main choice to be developed because it can provide healthy vegetables for families, maintenance techniques are relatively easy, and have high economic value. One of the reasons for the high price of organic vegetables is that the products produced are safe for consumption, the number of producers is very limited and the risk of failure is high so that they become exclusive products. Currently, many people are interested in organic food, one of the most popular organic foods is organic vegetables. This organic vegetable has a relatively more expensive price and less attractive appearance but has health benefits because it is produced without using chemicals. Moreover, the latest research facts show the nutritional advantages of organic food. The first activity carried out was making fertilizer using Pumakkal, then planting spinach water, bok choy, etc., watering vegetable seeds, fertilizing vegetables and cleaning the land, and controlling pests organically. After the vegetables have been harvested, the vegetables are sorted and cleaned for damaged or wilted parts, after cleaning the vegetables are tied according to a predetermined size. The vegetables that have been tied and cleaned, packaged, and labeled are then ready to be marketed to the general public.

PKM activities are training on the manufacture of processed organic vegetables, processed into nuggets and ice cream. Making processed nuggets and ice cream is a new idea for the community in processing vegetables so that children who don't like vegetables can still eat these organic vegetables. The training is intended to train skills and understand the importance of diversifying processed organic vegetable products. It means that organic vegetables can be processed into other products such as vegetable nuggets and organic vegetable sticks/dumplings. To get added value from harvested vegetable and fruit crops, housewives groups are given knowledge and skills after harvesting vegetable and fruit crops to produce high economic value products such as ice. vegetable and fruit cream, Astuti, D.A., et al, 2016. In addition to having a high economic value, ice cream is a product that is liked by children, making it possible to be used as a medium for children's vegetable consumption.

Through this Community Service Activity (PKM), knowledge and skills will be given to process organic vegetables. This is expected to be an alternative to increasing the household income of organic vegetable farmers through the introduction of the business of processing organic vegetable products into organic vegetable nuggets. Many types of organic vegetables can be processed into nuggets, including broccoli and carrots. Armed with the skills of processing organic vegetable nuggets provided by the PKM team, it is hoped that the farmer's family will be moved and interested in trying this organic vegetable nugget processing business opportunity so that the hope of increasing

farmers' household income will be realized. Thus, optimization of added value can be achieved in an industrial pattern that is directly integrated with family farms and agricultural companies.

The socialization and practice of buying and selling online through several social media and e-commerce applications involved group members of 15 people and 10 junior high and high school students who live in the village. The following is the web address for online purchases that can be visited at https://hijaudaun.berdu.pw/. Currently, various kinds of e-commerce are engaged in organic vegetable products. The emergence of e-commerce that sells agricultural products can certainly make it easier for consumers to get the agricultural products they need. Online marketing has the advantage of requiring relatively low investment costs, easy to use, wide network coverage, rapid dissemination and collection of information, and easy search for potential business partners. Pracaya, 2007. suggests that the main source of information about organic vegetable food is the internet.

In addition to the online trading socialization work program, he also sells crops and ice cream in two places, namely at Samber Field and the Muhammadiyah Metro University Rectorate Building. The impact of Organic Vegetable Cultivation in Hijau Daun Farmers Group is the process of growing vegetables without using chemicals such as chemical fertilizers, pesticides, and others. Organic vegetable cultivation uses organic materials such as manure. Charina A, 2017 the impact of organic vegetable cultivation is that it does not cause environmental pollution, both soil, water, and air pollution because it does not use chemicals, the vegetables produced do not contain toxins so they are safe for consumption. However, the physical appearance of organic vegetables is sometimes not good, such as smaller size and hollow leaves. Kartini8 K, et al. 2017. In this organic vegetable processing training, organic vegetables are processed into juice, nuggets, and ice cream. This processing training was carried out in a Hijau Daun farmer group in Karangrejo. The impact of the organic vegetable processing training is as a new idea for the community in processing organic vegetables so that children who don't like organic vegetables can still consume these organic vegetables Kurniaari D. 2021, and also as an idea for marketing organic vegetables in the processed form which of course has many benefits. demand and low level of competition.

According to research by Rifai, A. 2012, online buying and selling socialization to Hijau Daun farmers groups in Karangrejo has become a source of information for some consumers to know about organic vegetables and the organic vegetable market other than through garden owners. Currently, the marketing of organic vegetables does not only occur in supermarkets but the marketing of organic vegetables can also be expanded with the online system of Sarno S, 2019. The impact of online marketing of organic vegetables is not only profitable for sellers or garden owners but also provides convenience for consumers. in search of organic vegetables. In addition, the marketing of organic vegetables with this online system can expand the marketing area of organic vegetables.

3. Conclusion

The purpose of implementing PKM is to obtain an increase in the cultivation and marketing of organic vegetables in the Hijau Daun Farmers group, Karangrejo 23A, North Metro, based on the excessive use of chemicals in fertilization, overcoming pests in the care of vegetable crops in high quantities, of course, the use of chemicals with excessive use endangers the health of consumers. In addition to the excessive use of chemicals, and vegetables grown by the Hijau Daun farmers group, the price is dropping or falling, of course, there are many losses.

Therefore, the objectives of PKM are: 1. Introducing how to grow organic vegetables with Pumakkal Liquid Fertilizer, which reduces chemical residues so that plants are safer for consumption in the long term. 2. Increasing the creativity of the Hijau Daungroup in managing raw materials into products that can generate economic value and can compete and have a strategy of selling raw products both conventionally and online. The results of PKM activities can be concluded: 1. Organic vegetable cultivation with Pumakkal produces environmentally friendly products 2. Farmers have creativity in organic vegetable cultivation, processing raw materials into finished products that produce economic value. 3. Having an entrepreneurial spirit that can compete in modern times, so that you can sell offline and online.

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