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Making Biocarno Fertilizer from Marine Organic Waste to Increase the Income of the Abadi Fisherman Farmer Group in Kuala Indah Village

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ABSTRACT
Management of marine organic waste can also be used as a solution to reduce marine waste and prevent global warming considering that the sea has many roles in supporting the life of living creatures and maintaining the ecosystem. The organic fertilizer that will be produced will be called "Biocarno Fertilizer" with good quality. The aim of this activity is to form or develop the Abadi Fishermen Farmer Group which is economically and socially independent, helps create peace and comfort in social life, and increases the skills and income of Farmer Group members in producing Biocarno Fertilizer independently. The result of this activity is the completion of community service in the form of counseling and outreach carried out by the service team to partner farmer groups, namely making Biocarno fertilizer by mixing several raw materials such as marine organic waste, cow dung, rice straw, Azolla, EM4 and molasses as a bioactivator. composting process. The next planned stage that must be carried out is to monitor and evaluate the progress of compost maturation over the next month, then samples of the mature compost will be taken to be taken to the laboratory for nutrient analysis so that farmers can modify the compost raw materials to produce quality compost according to the standards determined by SNI 19-7030-2004.

Keyword: Biocarno Fertilizer, Marine Organic Waste, Kuala Indah Village

1 Introduction

The ocean plays an important role in the welfare of society, especially for coastal residents. Coastal areas are areas located between land and sea areas, which provide natural resources to meet people's living needs [1]. In addition to the potential natural resources that are widely spread across Indonesia's coasts, the potential for pollution of the coastal and marine environment also has quite large opportunities. Marine debris on the beach is marine debris that is deposited on the beach due to being carried by currents or sea waves [2].

Based on a survey conducted by the Ministry of Environment and Forestry in 2017 [3], it shows that the composition of meso-sized marine waste (0.5-2.5 cm) is dominated by wood (35.06%), plastic (24.96%), etc. while macro-sized (>2.5 cm) dominated by plastic (31.44%), wood (29.75%), etc. Furthermore, the national estimate of marine waste generation on beaches is that the average waste generation is 106,385 g/m2, and the total waste estimate (2017 survey results) reached 1.1-1.2 million tons or around 40%. The type of organic waste that dominates is wood waste, while the inorganic waste that dominates is plastic waste. The highest number of pieces of marine waste and weight of marine waste are dominated by organic waste.

Kuala Indah Beach, which is located in Sei Suka District, Batu Bara Regency, North Sumatra, has its own attraction for tourists. This beach has high natural resource potential and also has waste problems in coastal areas, namely marine debris pollution. The condition of Kuala Indah Beach is dominated by piles of marine

organic waste such as wooden twigs, seaweed, piles of stranded coral, and the remains of shells, so innovation is needed in managing marine organic waste by processing it into biochar and compost.

Nelayan Abadi Farmer Group is a group of farmers and fishermen located near the coast in Kuala Indah Village, Sei Suka District, Batu Bara Regency, North Sumatra. This farmer group is engaged in agriculture and the majority are fishermen who catch fish at sea. The Abadi Fisherman Farmer Group has great potential as an agent for managing marine organic waste that is scattered and piled up along the coast of Kuala Indah Beach. The lack of knowledge and education of farmers and fishermen in the Kuala Indah Village environment, especially in the Abadi Fishermen Farmers Group, means that they do not know how to process marine organic waste properly and correctly so that sustainable environmental pollution does not occur. Seeing the situation and conditions that occurred in Kuala Indah Village, the USU service team took the initiative to offer several solutions to the problems that occurred.

2 Materia and Method

The 2023 Regular Year Mono Service Activities will be carried out at the Nelaya Abadi Farmers Group, Kuala Indah Village, Sei Suka District, Batu Bara Regency. The steps taken to address the problems that occurred in the Nelaya Abadi Farmers Group were to carry out initial socialization of the solution plan offered by the service team to partners which will be proven by a letter of cooperation between the partners and the USU service team, after the partners understand and agree to the collaboration, then the team will hold a discussion regarding the timing of the outreach and socialization of the manufacture of Biocarno Fertilizer. This activity is also a top priority in several aspects such as economic aspects and socio-cultural aspects in society.

The approach method that will be used in implementing the Regular Year Mono Service program in 2023 is through a survey of potential/problems in the Farmer Group that is used as a partner, namely the Nelaya Abadi Farmer Group located in Kuala Indah Village, Sei Suka District, Batu Bara Regency. The activity continued with a Focus Group Discussion (FGD). Guidance training in the form of counseling on the technicalities of making Biocarno Fertilizer for processing marine organic waste, actions/activities and mentoring and conducting program outreach through counseling and discussions with direct farmer members.

In this stage, the lecturer as the proposer of the activity prepares all documents and complete files as well as preparing the raw materials that will be used as ingredients for making Biocarno Fertilizer. The files and raw materials that are available are stored in advance by the proposer until the handover of the equipment is carried out. Apart from that, the service team must prepare tools that support the process of this activity.

The materials used as raw materials for making Biocarno Fertilizer are Biochar and compost made from marine organic waste. Biochar and compost have previously been tested for chemical characteristics by the head of the proposer and research tests have been carried out in the laboratory [4].

It is hoped that Biochar and compost from marine organic waste will become the main source of the nutrient Potassium (K), manure such as cow manure or goat manure which is expected to be the main source of Phosphorus (P) nutrients, and Azolla as a source of Nitrogen (N) nutrients in making Biocarno Fertilizer. Previously, marine organic waste taken from the coast of Kuala Indah Beach had undergone initial chemical characteristic analysis tests, as well as other materials such as EM4, molasses, plastic, etc.

After the materials and tools were collected, the counseling and outreach stage was carried out to the fishermen farmers in the Abadi Fisher Farmers Group. How to make Biocarno Fertilizer goes through the following stages:

1. Processing organic waste into Biochar
2. Processing organic waste into compost
3. Addition of animal manure (cow or goat)
4. Addition of the green ingredient Azolla

These four ingredients will later be combined and processed into Biocarno Fertilizer with a ratio of (25% : 25% : 25% : 25%).

Monitoring the making of biochar and compost needs to be done, such as turning the compost raw materials so that the heat temperature is even so that the composting process can run well. Apart from that, it is necessary to measure the temperature to determine the dynamics of the composting temperature. If the compost dries

out, it is necessary to water it again with a little water mixed in. with molasses to become a starter for the microbes again. This monitoring process is also monitored by the service team lecturers and the students concerned. Ripe compost shrinks by almost 50% and has a loose, moist texture and is blackish brown in color and no longer smells or smells like the smell of soil. Likewise with the animal manure used and the Azolla used.

3 Result and Discussion

In carrying out the activity, the stages carried out by the community service team were the opening of the community service activity by the head of the service, remarks from the Sei Suka Village Head, remarks from the chairman of the Abadi Fisher Farmer Group, followed by socialization, FGD and discussion with the Abadi Fisher Farmer Group. In addition, materials were handed over to support the practical activity of making Biocarno compost which will be made from a mixture of marine organic waste biochar plus marine organic waste compost made from a mixture of cow dung and rice straw in a ratio of 3: 2: 1 (150 kg: 100 kg : 50 kg), tarpaulin measuring 5mx4m, 2 bottles of EM4, 2 kg of molasses, bucket, hoe, fork, compost temperature measuring instrument (thermometer), compost pH and humidity measuring instrument and other tools that support the composting process.

After that, it was continued with technical guidance and mentoring training activities in the field specifically to find out good and correct composting techniques. This practical activity was carried out by a service team of lecturers and students and together with members of the farmer groups who were also present and witnessed by village officials. This activity was attended by the service implementation team from USU, including Dr. Benny Hidayat, SP., MP (chairman), Nur Ulina Warnisyah Sebayar, SP., M.Agr (member), Jamilah, SP., MP (member), Sei Suka Village Head, all administrators and members of the Abadi Fisherman Farmer Group and 5 students from the Faculty of Agriculture include Adhira Mahardika, Mutiara Rizki Harahap, Muhammad Rafly, Muhammad Syah Deewa, and Alghi Fahri.

The opening activity was carried out by the LPPM USU Mono Regular Year 2023 community service team guided by the USU student MC and continued with several welcoming words from the Head of Sei Suka Village, as well as the Chair of the Abadi Fisherman Farmer Group. In his remarks, the Chairman of the Farmers Group stated that they as farmers have quite difficulty processing marine organic waste and cow dung because they do not have special skills so that with this service activity the Abadi Fishermen Farmers Group feels very grateful and optimistic that they can process marine organic waste and produce their own compost, become an independent farmer group and can be a role model for other farmer groups.

The next activity is counseling regarding biochar material delivered directly by the head of the service (Dr. Benny Hidayat, SP., MP), composting material delivered by service members (Nur Ulina Warnisyah Sebayar, SP., M.Agr), and Azolla material will be provided. delivered by a service member (Jamilah, SP., MP).

Next, farmers were invited to training in making marine organic waste biochar using a thermolysis tool that had been modified by the service team, followed by making good and correct compost. In this activity the farmers collaborated with USU students who helped the farmers carry out the composting process guided by the leader and members of the service team. The materials used in this composting process include tarpaulin as a compost cover, EM4 as a starter, molasses as an energy source for decomposer microbes, sufficient water, 150 kg of marine organic waste, 100 kg of cow dung, and 50 kg of rice straw, Azolla. , as well as the tools needed such as a machete for chopping, a hoe and shovel for turning the compost material, a pH meter to measure the acidity level of the compost and a thermometer to measure the composting temperature.

The supporting factor in implementing the service which really helped the realization of this activity was the positive response from farmers and the community at the partner locations, starting from surveying the service location, making proposals, sending signs and equipment during the service, to when the socialization activities and technical guidance assistance took place.

A positive response was shown by a good and warm welcome when the USU LPPM service team arrived at the location and when the activities were carried out. In this activity, it was seen that all farmers in the Tani Nelayan Abadi group had a high level of enthusiasm in participating in this activity to open their horizons and increase farmers' knowledge about processing marine organic waste into Biocarno fertilizer. Sei Suka Village officials also participated in supporting this activity.

The inhibiting factor in implementing this community service was unfavorable rainy weather so that the composting process and outreach activities in the field were slightly hampered due to the falling rain. However, the very high enthusiasm of the farmer group made the service team enthusiastic in carrying out this activity as well as the orderly attitude of the farmer group.

Apart from that, the lack of a special location or place to carry out the composting process means that farmer groups experience problems and difficulties in storing organic material or incubating compost that is in the process of decomposition.

Figure 1. Dissemination of information about making Biocarno fertilizer

Figure 2. Group photo of the service team with the Nelayan Abadi farmer group

4 Conclusion

Based on all the Community Service activities that have been carried out, it can be concluded that these activities provide many benefits for farmers, such as processing marine organic waste, livestock waste (cow dung), agricultural waste (rice straw) for making Biocarno fertilizer. Apart from that, currently the farmers are very happy and grateful to LPPM USU for being given the opportunity to learn good and correct composting techniques. In this activity, it was seen that all farmers in the Tani Nelayan Abadi group had a high level of enthusiasm in participating in this activity to open their horizons and increase farmers' knowledge about processing marine organic waste into biocarno fertilizer. Village officials also participated in supporting this activity.

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