

Conversion of Paddy Straw into Fertilizer and Animal Feed at Tanjung Rejo Village, Deli Serdang Regency, Medan, Indonesia

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Abstract: Community service activities was conducted in agricultural area of Tanjung Rejo Village in Deli Serdang Regency, Medan, Indonesia. The aim of this activity was to improved and to trained the farmer and rancher knowledge about converted technology of paddy straw to organic fertilizer and animal feed. The specific target was to help farmer and rancher community be able to produce fodder and organic fertilizer by their self, and prospected to improve their welfare. The community service activities were consist of counseling, training, practicing of paddy straw conversion methods directly in paddy fields and evaluation of results. The counseling was conducted in meeting hall of the village head's office of Tanjung Rejo Village and attended by headman, farmers and ranchers of village. The head team and members of community service from Department Biology of Universitas Sumatera Utara were explained the theory and techniques of conversion of paddy straw become organic fertilizer and animal feed. Some villagers asked some questions and after discussion, the farmers and ranchers practiced the straw chopper methods. The training has done proactively by the village communités. One unit of straw chopper machine were granted to the villagers. Monitoring and evaluation of paddy straw conversion activity were also done in the paddy field location. Community service teams were needed to confirm that the conversion paddy straw activities were done well. Monitoring and counseling also conducted by phone to provide solutions if the villagers had the problems. Generally, the results of community service activities were successful. The farmers and rancher were able to convert paddy straw to animal feed and organic fertilizer respectively. Another benefit of this activity was to established of good relationships between communities and Universities peoples. The members of community service could be applied and shared their knowledge to the communities.

1 INTRODUCTION

Deli Serdang Regency in Province of Sumatera Utara has big area of paddy fields which potential producing large amount of paddy straw waste. The coastal area of 63,002 Ha consists of 4 districts, namely: Sub-district of Labuhan Deli, Hamparan Perak, Percut Sei Tuan and Pantai Labu. Percut Sei Tuan sub-districts is one of the coastal areas that need to be developed through the management of coastal areas, one of which is the beach in the village of Tanjung Rejo.

Deli Serdang Regency has a long beach of 65 km. Along the coastal, the potential areas are within 15 villages and 711,663 inhabitants. Coastal villages have 4 districts as shown in Table 1. The village of Tanjung Rejo, located in Deli Serdang Regency is a

development area of Sumatera Utara East Coast which has high enough fishery and marine potential, where the average people work as fisherman. However, because the condition of fishermen is now catching less and less fish so many fishermen are changing professions as farmers and ranchers.

The average of Tanjung Rejo village farmers grow paddy. Production of paddy straw can reach 12-15 tons per ha / round harvest or 4-5 tons of dry material depending on the location and variety used. (Yunilas, 2009). One alternative to the provision of cheap and competitive feed is through the utilization of agricultural waste, especially paddy straw. To increase the nutrient content of paddy straw, it is necessary to do the processing/fermentation. (Sugama, I.N, and N. L. Gede Budiari, 2012).

Farmers grow crops and ranchers keep chickens, ducks and cattle. The condition of farmers and ranchers in the village also get a simple knowledge about farming and livestock. Crops and livestock products can only meet the daily needs, because the production process both farming and ranching requires a large cost, so that farmers and ranchers borrow money first from a money lender for the production process.

The benefit of this activity is to help the people of Tanjung Rejo village in terms of making fertilizer and animal feed and introducing the culture of paddy straw in daily life to reduce family needs so that the family economy will be better.

2 RESEARCH METHODS

2.1 Materials and Methods

This activity was used the counseling and lecturing methods. The community service teams were explained the theory and techniques to converted of paddy straw to farmer and rancher group community in Tanjung Rejo Village. The farmers and ranchers were tried the theory of paddy straw processing, started from chopped straw from raw material until ready to use for organic fertilizer and animal feed. All do this activity by proactively doing the training to get the result of organic fertilizer and animal feed. The Equipment for paddy straw cutter machine has been given so that the community groups can make it by their own self.

Monitoring and evaluation of the success of paddy straw utilization, monitoring of field work will be done by going directly to the field jointly, monitoring with visits to see if the community already can make organic fertilizer and handicraft materials. In addition, the relationship will be done by phone to overcome the problems if arise.

In general, community service activities are successful and there is a good relationship between

universities, especially the Implementation Team, government officials and farmers / ranchers community in Tanjung Rejo Village. The people of Tanjung Rejo Village realize the importance of saving the environment while improving living standards because they can make their own organic fertilizer and feed for animals.

The success of community service activities cannot be separated from the participation and support of village officials such as Tanjung Rejo Village chief and staffs, Farmers and Ranchers groups to participate in this activity.

2.2 Description of Paddy Waste Utilization as Animal Feed

2.2.1 Counseling

Topics covered in the counseling meeting with the farmers and ranchers were how to make animal feed and organic fertilizer, and also tools and materials preparation.

2.2.2 Training of Making Animal Feed

Before starting to make a animal feed, location selection is a factor that need to pay more attention. Ground floor and shade (not exposed to heat and rain) was the best choice. Paddy straw was stacked as thick as 20 cm from the floor then compressed by being trampled on. Microorganism starter for process fermentation were made from mixture of Tapai (fermentation food from Cassava), yeast, straw and then suspended it in water. The microorganism starter was inoculated on the haystack until wet. The water content in suspension was according to water content of paddy straw. Step by step process to stacking of paddy straw as above procedure were repeated for several times until the straw runs out. Paddy straw stacks were covered with plastic or dried straw and incubated for 7-10 days. Process fermentation was finished when the haystack hve

Table 1. Coastal Villages in the Four District of Deli Serdang District

No	Coastal Village	Area (Km ²)	Population (poeple)	Fishermen (people)	Information
I.	Hamparan Perak Sub-D				
1.	Paluh Manan	18,93	11.059	618	wide : 230,15 km Total population = 112.967 jiwa
2.	Paluh Kurau	32,50	2.421	268	
3.	Sei Baharu	8,00	4.504	149	
4.	Lama Kp. Lama	5,09	2.684	264	
5.	Hamparan Perak	9,00	3.975	37	
II.	Labuhan Deli Sub-D				
1.	Karang Gading	66.35	4.246	291	wide : 127,23 km Total population = 45.261
2.	Pematang Johar	20.00	11.640	98	

Table 2. Coastal Villages in the Four District of Deli Serdang District

III.	Percut Sei Tuan Sub-D				
1.	Tanjung Rejo	19,00	7.164	208	wide : 190,79 km Total population = 249.989
2.	Percut	10,63	10.422	653	
3.	Pem. Lalang	20,10	20.55	50	
4.	Tanjung Selamat	16,33	40.59	12	
IV.	Pantai Percut Sub-D				
1.	Paluh sibaji	1,37	2.548	1.174	wide : 81,85 km Total population = 38.205
2.	Deni Kuala	4,59	1.751	28	
3.	Bagan Serdang	1,68	1.028	643	
4.	Regemuk	3,00	1.773	693	
5.	Sei Tuan	14,00	170	16	

produced a caramel/tapai smelly, the texture of straw fibers become smooth (check by hand or kneading), and found a white and yellow mushroom. The fermentation process was continued for 10 days when the straws weren't mature.

2.2.3 Training of Fertilizer Production

First, chopped hay were stack as high as 25 cm. . The haystack was made up to 4 layer. Each layer was added manure and fungus of Trichoderma. The haystack then watered and covered with plastics. The

compost will be matured when it's colour turn brownish black and smell like soil odour.

3 RESULTS AND DISCUSSION

Implementation of activities carried out by way of counseling and lecturing, explanation of the theory and techniques of paddy straw utilization, followed by community groups in the village of Tanjung Rejo Deli Serdang District. Villagers listen to the material



Figure 1. Community service team from Universitas Sumatera Utara presented the theory and technique to convert paddy straw to fertilizer and animal feed (a), the leader of community service team, Dr. Yurnaliza, M.Si.



Figure 2. Paddy straw chopper (a), Handover of chopper to farmer (b) and rancher (c).

presented by the community service team (Figure 1). The material presented concerns about the benefits of paddy waste as organic fertilizer and animal feed.

It is expected that community groups can reduce the cost of household production because they can get and produce organic fertilizer and animal feed themselves in accordance with their needs. So community groups can save the environment and improve the living standard of their families.

The training was conducted by community groups in Tanjung Rejo village trained by a community service team. All conduct this activity by proactively conducting training to obtain results in the form of organic fertilizer and animal feed from paddy waste. Results are seen directly for the utilization of paddy waste within a few days. Tools in the form of counter tools have also been given so that groups of farmers and ranchers can make their own.

The community service team granted the machine of paddy straw chopper to the farmer and rancher (Figure 2). The chopper machine was able to crushed paddy straw into small grain. The machine was very helpful and will reduce time consuming in converted paddy straw to the final product.

The waste of paddy straw in Tanjung Rejo village was abundant especially when harvesting time. The farmer and rancher were able to use it freshly. The people were very easy to use it directly as a raw material for making organic fertilizer (compost) and animal feed. The tools used for making compost and animal feed in the form of straw chopper have been given so that the village community can make their own. In addition, the villager was able to save their agricultural land from paddy waste while improving living standards because they can make organic fertilizer and animal feed themselves.



Figure 3. The farmer and rancher practiced the chopper machine to reduce size of paddy straw before make a fertilizer and animal feed.

The making of fertilizer and animal feed takes time to produce the product, because the process should be silenced or fermented for several days. So community groups should have technical use and utilization.

4 CONCLUSION

Community service of team USU in Tanjung Rejo village was success to teach the farmer and rancher to convert paddy straw to fertilizer and animal feed and the communities listened and implemented that theory enthusiastically and cooperatively.

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