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# Training for Making a Portable Gas Container In Taduken Raga Biogas Group Sinembah Tanjung Muda Hilir Subdistrict Deli Serdang Regency

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## Abstract

The Taduken Raga Biogas Group, Sinembah Tanjung Muda Hilir District, Deli Serdang Regency in 2018 participated in the biogas procurement project from the Ministry of Environment in collaboration with the University of North Sumatra. At that time, all of the project equipment was brought in from the center so that the Taduken Raga biogas group did not fully understand the technology. In 2018, there were around 20 families who used biogas for cooking. Then there was a problem so that gas production stopped. The main problem is that it is not clear about the technology, among others, that the biogas units must be routinely filled with waste including empty bunches, cow dung, chicken manure and household organic waste. If the community uses gas, then the community is obliged to fill the biogas units. Not all of the 20 households that use gas are pleased to routinely fill the biogas unit. This service has been carried out in the Taduken Raga biogas group in Sinembah Tanjung Muda Hilir Subdistrict, Deli Serdang Regency. In accordance with the results of the initial survey to the Taduken Raga group / location of the biogas unit, it was known that the group's desire was to be trained in how to make portable gas containers. With the gas reservoir, people who want to use gas must compensate, among others, in the form of labor participation or others. The gas storage is filled with gas from the biogas unit and brought to be installed in the people's houses which provide compensation. Previously, gas was flowed communally so that both those who participated and those who did not uniformly received gas. Target activities are: 1) The public knows more clearly about biogas technology 2) The community knows how to make portable gas containers.

**Keywords:** biogas; container; palm oil empty bunch; cow dung; household organic waste

## 1. Introduction

Deli Serdang Regency has 22 sub-districts, Deli Serdang Regency as part of the eastern coast of North Sumatra Province is located between 2 ° 57 North Latitude and 3 ° 16 South Latitude and 98 ° 33 - 99 ° 27 East Longitude with an area of 2,497.72 km<sup>2</sup>. The region of Deli Serdang Regency is bordered to the north with Langkat Regency and the Malacca Strait, to the south with Karo Regency and Simalungun Regency, to the east with Serdang Bedagai Regency and to the west bordering Karo Regency and Langkat Regency (Deli Serdang Statistics, 2019).

Deli Serdang Regency has a very strategic position, because it is directly adjacent to the Malacca Strait, as one of the busiest shipping crossings in the world. This regency surrounds 2 (two) main cities in North Sumatra. With a strategic position, the natural resources and manpower owned by Deli Serdang Regency will be a potential that can be developed into a competitive advantage in facing competition in attracting investors to develop their businesses in this area and other targets in marketing the products / services produced (Statistics Deli Serdang, 2018).

The problem faced by the community at this time, especially in Taduken Raga village, Sinembah Tanjung Muda Hilir sub-district, is that they do not understand about biogas technology, which in the village in 2018 there was a biogas project procurement from the Ministry of Environment in collaboration with the University of North Sumatra. The community, especially the Taduken Raga Biogas Group, need training on biogas technology especially how to make portable gas storage. According to Ginting (2017) biogas technology is kind of technology which give many benefits to people in remote area such as energy for roasting coffee bean. In addition Ginting (2018) mentioned that energy from biogas could help people in remote areas to cook pig feed. Biogas energy could also use as a brooder (Ginting, 2018).

Activities that have been carried out are 1). held training and counseling on biogas technology 2) held training and counseling on making portable gas containers.

## 2. Methods

Participatory training and community empowerment have been conducted on biogas group which called Taduken Raga, all community service activities are carried out to the community by using group as learning media and mentoring using adult learning methods and andragogy, planning and monitoring and evaluation of all of the community service activities. According to Diana et al (2018) training can help people understand new things while increasing social progress and economic growth. In addition Kandou (2013) mentioned that people also became more productive after joint a training and created motivation (Rukka and Wahab, 2013).

Participatory Rural Appreciation so that group members are actively involved and the community as subjects while universities as facilitators. Sulaefi (2017) mentioned that there was a tendency that people became more active and discipline after attending a training.

Comprehensive namely all community service activities carried out simultaneously related to human resources, raw materials and processes through counseling, training and assistance

Based on appropriate technology that is applying affordable technology both materials and tools and can be done by biogas group in supporting their business through the application of the ability to develop quality product. The methods were implemented by Ginting et al (2018) in conducting extension in Samosir Island.

Furthermore, the above method is implemented in 5 (five) stages, namely:

Conducting observations or surveys to determine the conditions on the ground, by exploring the problems faced by biogas group in STM Hilir subdistrict, Deli Serdang Regency.

Questions and answers or interviews were conducted with biogas group to find out their potential and enthusiasm in the service program, namely biogas container/portable.

The activity of introducing a community service program in which the community service team introduces a plan of community service activities to members of biogas group. At this stage, agreed upon the time and schedule of activities that will be carried out in detail about the delivery of material, training / demonstrations, counseling assistance and training.

Counseling was conducted in the form of training lectures and demonstrations at Taduken Raga village, STM Hilir subdistrict, Deli Serdang Regency. Counseling activities are divided into 2 materials namely biogas technology in general and biogas container/portable e. Carry out monitoring of products.

## 3. Result and Discussion

From the interview with the Taduken Raga group, it was found that the group's needs included portable gas storage/container. This is because the gas formed in the biogas plant is difficult to distribute directly to homes due to the weak gas pressure, inadequate gas generation capacity and the unfavorable underground pipeline installation system. Therefore, the solution to this problem is to collect gas in portable plastic containers and bring the plastic home. At home, the plastic is placed outside the kitchen where previously prepared a cantilever to hold the gas container and a shade to protect the gas container from sunlight and rain. The gas hose of the plastic gas container is connected to a stove. Then the plastic is pressurized with a plank. Furthermore, the gas can be used.

The gas storage plastic is made of PE plastic with a thickness of 20 microns. This plastic is spiced in factories because 20 micron thick plastic is not sold in the market. Plastic has a diameter of 1 meter. Furthermore, the plastic is cut along 2 meters in order to obtain a volume of about 1200 liters according to the cooking needs of about 1 or 2 days (Widji, 2007). One part of the plastic is clamped using a special plastic clamp / sealer and the other part is installed with a pipe, stop valve, brass valve and gas hose.

In the implementation of the training, participants were able to absorb the knowledge that was conveyed, because generally the participants were adult men who were previously involved with the Taduken Raga gas installation since 2018. However, there was little concern for the participants because of the large plastic size of the gas container. They were afraid if the container is leaking. They want it to be reduced to around 750 liters only. Actually the participants' concerns can be understood, but biogas is different from LPG gas. Biogas is lighter than air, so if there is a leak, the gas will flow into the air, in contrast to LPG gas, which is heavier than air, so that if it leaks it will still be around humans and could harm on human. In addition, biogas is a gas with low pressure (Rajakovic, 2006).

Biogas is not economical when stored in cylinders. This is because the biogas molecule is a monomer, so to store it also requires very strong pressure and thick and strong material. Therefore, the simplest way is to store it in plastic.

During the training, the gas in the installation was able to fill 2.5 plastic gas storage units, meaning that the total gas obtained from the filling process of the installation produced around 3000 liters of gas. Thus, the Taduken Raga group came to understand that they have to fill in more inputs such as tankos soaking liquid, cow feces and vegetable waste if they want to get more biogas.

The biogas plant requires the addition of a starter. During this time the group took the starter from the palm oil factory IV pond which is located far from Taduken Raga. Participants want to be taught how to make starters and during the training they also teach starter theory.

In the future, other forms of gas storage that are assumed to be better than PE plastic with a thickness of 20 microns will be tried, such as gas storage from abandoned rafting boats or inner tires a truck.

#### 4. Conclusion

A training on making portable gas plastics container had been conducted. With the plastic gascontainer, the group can again cook at home using biogas because the gas installation has problems in the underground pipeline. In addition, the gas pressure was not strong enough to push gas into homes.

The existence of portable gas plastics containers were welcomed by the staff of the Deli Serdang Regency Environmental Service as the Taduken Raga biogas unit was again beneficial to the community. In addition, the Deli Serdang Regency Environmental Service after the pandemic can include biogas for the Technology Exhibition in Deli Serdang Regency.

It is suggested that this technology be more widely disseminated so that its benefits can be felt more widely by the community. Many people in Deli Serdang Regency have cattle and their feces is a potential source of biogas rather than just polluting the environment.

#### References

- [1] Diana Harding, Anissa Lestari Kadiyono, Yuyun Hidayat, Nurul Yanuarti. 2018. Pelatihan dan pengembangan sdm sebagai salah satu upaya menjawab tantangan mea. JPSP: Jurnal Psikologi Sains dan Profesi. Vol. 2, No. 2, Agustus 2018: 185-192. ISSN: 2614-2279 e-ISSN: 2598-3075
- [2] Erlin Emilia Kandou. 2013. Pengaruh pelatihan dan pengembangan karyawan terhadap produktivitas kerja karyawan (Studi Pada PT. Air Manado) Erlin Emilia Kandou. Jurnal Ekonomi Bisnis, Tahun 10, No. 2.
- [3] H Rukka, A Wahab . 2013. Faktor-faktor yang mempengaruhi motivasi petani dalam pelaksanaan kegiatan P2BN di Kecamatan Barru, Kabupaten Barru. Jurnal Agrisistem 9(1), 46-56.
- [4] Ginting, N. 2017. Biogas Technology on Supporting "Sustainable" Coffee Farmers in North Sumatera Province, Indonesia. IOP Conf. Series: Materials Science and Engineering 180 (2017) 012112 doi: 10.1088/1757-899X/180/1/012112
- [5] Ginting, N. 2018. Substitution of pig feed preparation using firewood with biogas in samosir Island: transforming an environmental catastrophe into environmental, social, economic benefits. IOP Conf. Series: Materials Science and Engineering 309 (2018) 012053 doi: 10.1088/1757-899X/309/1/012053
- [6] Ginting, N and R Hidayat. (2018) Sustainable brooder for supporting local chicken in North Sumatera Province, Indonesia. IOP Conf. Series: Materials Science and Engineering 309 (2018) 012052 doi:10.1088/1757-899X/309/1/012052 pp 1-4
- [7] Nurzainah Ginting, Nurlisa Ginting, Dwira Nirfalini Aulia, Juliza Hidayati. 2018. Utilization of Moringa (Moringa Oleifera) as a Multi Function Plant for Conservation Land in Lumban Suhi-Suhi Village, Samosir Regency. Journal of Saintech Transfer (JST) Vol. 1, No. 2, 2018/156-163
- [8] Rajakovic, N and Milomir, K. 2006. Biogas – Energy Instead of Waste. Sixth International Symposium Nikola Tesla, Serbia.
- [9] Sulaefi. Pengaruh pelatihan dan pengembangan terhadap disiplin kerja dan kinerja karyawan. 2017. Jurnal Manajemen dan Kewirausahaan. Vol 5 No 1.
- [10] Widji, A. 2007. Menuju Masyarakat Mandiri Energi. Cipta Tani Lestari, Pusat InkubatorBisnis - ITB, Bandung.