

The Analysis of Effect of Biogas-Based DME (*Desa Mandiri Energi* or Energy Independent Village) Program to the Society Well-Being (Case Study in Bendosari Village, Pujon Sub district, Malang District)

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ABSTRACT

The poverty and low level well-being are two issues encountered by the rural society. One of the reasons is the extinct and highly-cost energy. To resolve the problem, biogas-based DME (Desa Mandiri Energi or Energy Independent Village) Program is carried out by utilizing the cow waste. This study aims at analyzing the effect of the biogas-based DME Program to the social and environmental conditions, as well as the benefits the society obtain from this program. This study uses a descriptive qualitative approach. The data collection is carried out by doing the field observation, interviewing the informants, and taking pictures and obtaining other supporting documents.

The research finding exhibits that the biogas-based DME Program does not give sufficiently significant effects to the society well-being. The social and environmental effects include the harmonious relationship of the society and less pollution which increases the quality of environment. In addition, the biogas can replace LPG, firewood, kerosene, and electrical energy.

Key words: *independent village, society well-being, social, environment, energy*

INTRODUCTION

Indonesia is one of the developing countries whose population is 258,162,133 (World Bank, 2015). This high population will create various problems if not followed by the equal economic development (Nasikh, 2016). One of the problems is the poverty. The poverty is one of the complex issues which can trigger other new problems (Nasikh, 2017a; Nasikh and Moehersono, 2015). The high level of poverty is marked by the higher number of less-privileged families in the rural areas than in the urban areas. The data shows that the number of less-privileged families is 17.89 million (BPS, 2017). Meanwhile, the rural facility and infrastructure are still insufficient, especially in the fulfillment of energy needs. According to Pranoto (2009: 83), the energy need of the rural society is the electricity to replace the kerosene, and in the present time approximately 20% of villages in Indonesia demand the electricity to improve their society's performance. The data from Indonesian Energy Outlook reveals that in the last three years the energy consumption in Indonesia keeps increasing. It can be seen in Figure 1.

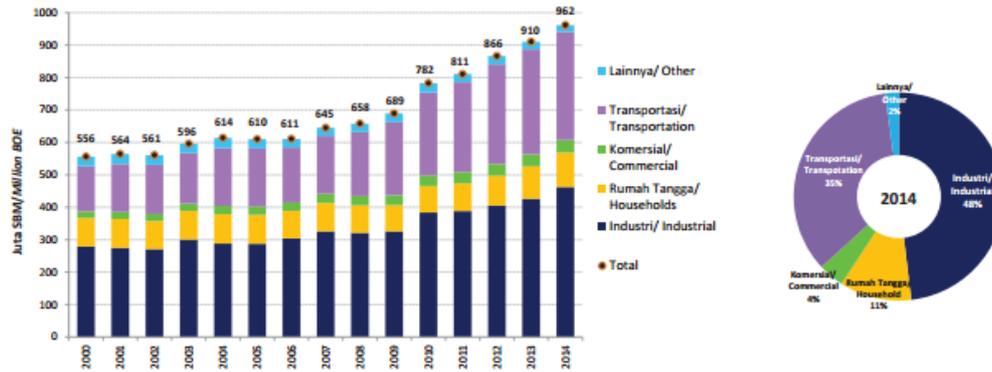


FIGURE 1 The Final Energy Consumption Per Sector in 2000 to 2014.
Source: Indonesia Energy Outlook, 2016.

According to Figure 1 the final energy consumption per sector in Indonesia tends to increase each year. During the last three years, the consumption gets higher as much 866 million SBM/ Million BOE in 2012, 910 million SBM/ Million BOE in 2013, and 962 million SBM/ Million BOE in 2014. The increasing energy consumption can cause some problems; one of them is the limited energy supply to meet the energy demand.

The lack of technology application to generate efficient and affordable energy is one of the biggest obstacles for the rural development in some developing country (Singh & Maharjan, 2003). The majority of rural society highly depends on the energy uses, such as LPG, kerosene, and fossil fuel which are getting expensive and extinct. The increasing price in the last few years causes the high expenditure for the energy (Zasriati, 2018). This issue will affect the society who earns low income, in which their money can only be used to fulfill the basic needs. Even, some people are unable to afford their basic needs. This phenomenon will make the society well-being keeps decreasing (Rambe, et al, 2008). Furthermore, the government can only meet 50% of the national LPG needs which reaches 4.3 million tons per year (Elizabeth & Rusdiana, 2011). Therefore, the role of government is required to improve the society well-being through the activities that are directed to the economic sector, especially for the society with low economic condition (Nasikh, 2017b).

Desa Mandiri Energi (DME) or Energy Independent Village Program is one of the programs that is implemented to improve the society well-being by fulfilling the energy needs of people living in the rural areas. DME Program guarantees the energy supply by using the technology run by the local people. They utilize the energy potential namely biofuel and non-biofuel. This program aims at eradicating the poverty, strengthening the national economy, and improving the environment (The Ministry of Energy and Mineral Resources, 2009).

The rural society generally works as farmers and stock farmers, so the farming and stockbreeding waste is very potential to be used as the newly alternative energy source (Nasikh, 2013; Nasikh, 2014). The utilization of cow waste is called biogas. The biogas is flammable gas obtained from the fermentation process of the organic materials by the anaerobe bacteria (Hastuti, 2009). The biogas is one of the newly renewable energies

derived from water waste of the household, liquid waste of chicken, cow, and pig farms, organic waste of the market, food industry waste and others (Inderawati, et al, 2016). The biogas energy is a farming waste utilization which aims at meeting all the energy needs replacing the electricity, LPG, and fossil fuel. The attempt to fulfill the energy needs in the rural area aims at achieving the well-being. The biogas potential is very huge if seen from the economic point of view. One m³ of biogas is equal to 0.46 kg of LPG, 0.62 liter of kerosene, or 3.50 kg firewood (Hamidi, 2016). Other than reducing the dependency to the fossil fuel, the biogas can lower the economic burden of the society. Not to mention that it can be produced in the small scale and simple construction (Hariyati, 2006).

Bendosari Village is chosen as a pilot location for the Renewable Energy-Based Independent Village based on the Decree of Regent Number 180/363/Kep/421.013/2013. The biogas-based DME Program is also included in the Middle-Term Development Planning of Rural Areas in 2014 to 2019. Based on the data from the Village Office of Bendosari in 2017, the number of stock farmers is 468 with 1699 dairy cows which are located in five villages. The data is shown in Table 1.

TABLE 1 The Data of Stock farmers and Dairy Cows in Bendosari Village in 2017

No	Village	The Number of Stock Farmers	Percentage (%)	The Number of Dairy Cows	Percentage (%)
1	Cukal	154	33%	467	27,5%
2	Dadapan Wetan	77	16,5%	284	16,7%
3	Dadapan Kulon	166	35,5%	713	42%
4	Tretes	71	15%	235	13,8%
5	Ngeprih				
Total		468	100%	1.699	100%

Source: Data is processed in 2018

Based on Table 1, it can be seen that Cukal Village has the most stock farmers, which are 154 stock farmers (33%) and 467 dairy cows (27.5%). Meanwhile, Dadapan Wetan Village has 77 stock farmers (16.5%) and 284 dairy cows (16.7%). Next, Dadapan Kulon Village is populated with 166 stock farmers (35.5%) and 713 dairy cows (42%). Last but not least, Ngeprih and Tretes Villages have 71 stock farmers (15%) and 235 dairy cows (13.8%).

Previous studies have discussed the biogas program. The study conducted by Evi (2017) focused on the performance of the biogas-based DME Program. Another research by Wiyono (2014) emphasized on the implementation of the biogas-based DME Program. Meanwhile, Widaningsih (2014) in her study highlighted the society involvement or participation in the biogas-based DME program. In addition, Hublin, et al. (2014) conducted the study to measure and find out the economic benefit of biogas. With the different focuses of the four studies mentioned above, the researcher is interested in conducting the research which focuses on the effect of biogas-based DME Program to the society well-being.

METHODOLOGY

This study uses the descriptive qualitative approach with the case study. In this study, the researcher becomes the full observer and the key instrument that interacts directly with the informants. The study takes place in Bendosari Village, Pujon Sub district, Malang District. This location is chosen because Bendosari Village is the pilot village of the Renewable Energy-Based Independent Village Program based on the Decree of Regent Number 180/363/Kep/421.013/2013. Another reason is because Bendosari Village actively runs the energy-based DME Program with biogas. The data source is the primary data that is obtained from the observation and interview with the informants by using the questionnaire with the structured questions, and secondary data. The latter is obtained from the documentation, literature study, previous studies, and official document of the Village Office. The data is obtained by using observation, interview, and documentation techniques. The informants are determined by using the purposive sampling technique. The comprehensive interview is done with the Headman of Bendosari Village, Mr. M. Khoirun, S.E.; KPTK Head of DME Program, Mr. Arintoko; some biogas users, namely Mr. Suqignyo, Mr. Sutiyono, Mrs. Ida, Mrs. Sriwati, Mrs. Febri, Mrs. Siti Fatimah, and Mrs. Ika; and several local people who get the benefits from the biogas-based DME Program, namely Mrs. Nuryapeni, Mrs. Selvi, and Mrs. Laila.

The data is analyzed by using the interactive analysis model, which includes data collection, data reduction, data presentation, and conclusion drawing. To check if the data is valid, the researcher extends the observation, observes continuously, and conducts triangulation. The triangulation used is the technique triangulation. The research is carried out in three stages. First, the preparation stage includes planning the research, obtaining the permission to conduct the study, and examining, observing, and measuring the location, as well as determining the informants, arranging the research plan, and preparing the research tools. Second, the implementation stage covers data collection, data processing, data analysis, and conclusion drawing. Last but not least, the reporting stage. In this stage, the research finding is written in the form of the undergraduate thesis entitled the effect of biogas-based DME Program to the society well-being in Bendosari Village, Pujon Sub district, Malang District.

RESULTS AND DISCUSSION

The interview by using the questionnaire to the seven informants/respondents who used the biogas showed that DME Program has not significantly affected the society well-being. According to the information obtained from the third informant, namely Mr. Suwignyo, who was interviewed by using the questionnaire (see the attachment of Table 2 in Appendix), the use of biogas could only reach the Prosperous Family level. However, there was a change in the sub indicator number 24 as RT Head. It was because after using the biogas, the informant was able to improve his social sense which was reflected from his good relationship with other people and more time allocation to involve in the social activity in the society. Meanwhile, the fourth respondent called Mr. Sutiyono in his comprehensive interview by using the questionnaire (see the attachment of Table 3 in Appendix) stated that his family's well-being was still in the Prosperous Family I before and after using the biogas. However, after using the biogas there was a change in the eighteenth indicator. The family used to eat together once a day, but now they have more family time because they do not have to search for the firewood. In addition, the fifth and sixth

respondents named Mrs. Ida and Mrs. Sriwati, argued in their comprehensive interview (see Table 4 in Appendix) that their families were still in the Prosperous Family I before and after using the biogas. However, after using the biogas there was a change in the eighteenth indicator. The family used to eat together once a day, but now they have more family time because they do not have to search for the firewood. Mrs. Febri and Mrs. Siti Fatimah, the seventh and eleventh informants revealed that their family well-being level before and using the biogas was in the Prosperous Family I. This was because of their increasing needs, particularly their children's school fees. According to the comprehensive interview by using the questionnaire with the twelfth respondent named Mrs. Ika, it was revealed that there was a change in her family well-being level. Her family is now in the Prosperous Family I which is marked with her involvement as TB cadre and pine park staff, so she earns her own incomes. Despite the fact that her family was still in the Prosperous Family I after using the biogas and they were not able to meet all prosperous family indicators, there was a change in Indicator number 19 in which her family could participate actively in the social activity around her neighborhood by being TB cadre.

The biogas-based DME Program also affected the social and environmental conditions in Bendosari Village, Pujon Sub district, Malang District. According to the interview result with the twelve informants, it was revealed that the biogas-based DME Program gave a positive impact to the social condition of the society which included the better and closer social relationship among the biogas users, improved harmony between stock farmers and non-stock farmers, and the change of stock farmers' attitude in managing the cow waste with the biogas technology. In addition, the environmental effect in Bendosari Village, Pujon Sub district, Malang District was reflected from the less environmental pollution, namely water, soil, and air pollutions, the cleaner environment, and fewer wood cutting done by the local people. The benefit obtained by the society from the biogas-based DME Program was that it replaced the use of LPG, firewood, and semi-organic fertilizer.

The biogas-based DME Program which began in 2013 affected the society well-being in Bendosari Village, Pujon Sub district, Malang District. The change could be seen from the comprehensive interview result that was carried out by using the BKKBN indicator-based questionnaire. The indicator was used as the benchmark to determine the society well-being. There were three categories of well-being, namely Pre-prosperous Family, Prosperous Family I, and Prosperous Family. The indicator was used to identify the society well-being before and after using the biogas.

The result of the comprehensive interview by using the questionnaire revealed that only one out of seven respondents had their well-being level changed after using the biogas. The change was that the Pre-prosperous Family escalated to the Prosperous Family I after using the biogas. It was identified from the fulfillment of the basic needs and the social and psychological needs. The improvement in terms of prosperity was the family had more time to do other works other than searching for the firewood. The family member used their free time to do other works which earned more income. This was supported by the study carried out by Hastuti (2009) which found out that the use of biogas could save the society's time because they did not have to search for the firewood, so they could do other jobs which added the economic value.

Meanwhile, other six respondents were not affected by the use of biogas to improve their well-being. Four out of 6 respondents experienced the indicator change in the prosperous family category, while other two did not feel any changes after using the biogas. The four respondents did not feel the indicator change because not all indicators were met, but only one indicator changed. In addition, one respondent remained in Prosperous Family

I level, but she got one indicator change in the Prosperous Family level after using the biogas. The change was due to the fact that she involved more in the social engagement after using the biogas. Thus, she had better relationship with other people. Other three respondents remained in Prosperous Family I before and after using the biogas, but they got one indicator changed in the Prosperous Family level namely having meal time together with the family member at least once a day. This was because they did not have to search for the firewood, so they had more quality time at home with their family. Other two respondents remained in the Prosperous Family I before and after using the biogas, which meant that the family did not improve their well-being. It was identified from their failure to meet all indicators in the Prosperous Family (family development needs). The stagnant condition before and after using the biogas was caused by the increasing family need from year to year, particularly the children's school fees. Consequently, the money used to purchase LPG/firewood was used to pay the school need, such as the course fee.

The social effect of the biogas to the society in Bendosari Village, Pujon sub district, Malang district included the better relationship among the society. The better relationship was experienced by the biogas users because they had more times to gather around when joining the biogas-based DME Program socialization. They could share information about how to manage the waste better as well as how to maintain the biogas installation. In addition, the use of biogas could also affect the relationship between the stock farmers and non-stock farmers. Those who raised the cows no longer threw the cow waste to the gutter—which used to raise a conflict with the surrounding neighbors. After turning the waste to be the biogas, the environment was cleaner and people could hang around more comfortably. Yuwono & Sidqon (2014) stated that the development of biogas digester could resolve the social issue around the cow farming. Another positive effect was the local people worked hand in hand to manage the waste well. Those who raised the cows with limited place could distribute the waste to the neighbors who managed the biogas with wide land, so they could have the biogas distributed and used together.

The biogas-based DME Program brought positive effect to the environment. As explained by Jimmy & Hudha (2011), the utilization of the cow waste as the biogas could minimize the pollution, make the environment cleaner because the waste that used to be thrown in the gutter, now flown to the biogas, and reduce the wood cutting in the forest. However, the research by Herriyanti (2015) exhibited a result that the biogas has not given a significant effect to the environment. This was due to the fact the most people have not applied the zero waste concept, in which the biogas output has been utilized as the fertilizer, but the liquid fertilizer has not been managed. Mulyono (2000) found out that the waste management could be an alternative energy source, soil fertilizer, and sludge for farm animal food. In addition, the waste management could also improve the environmental sanitation, so the environment was cleaner and the local people could avoid the hazardous waste which could harm their health.

After the implementation of the cow waste management, there were some changes the society felt. First, there was less water, land, and air pollution caused by the cow waste thrown directly by the stock farmers. Second, the environment was cleaner because the cow waste was utilized to be the biogas. Next, the environment quality was better because the biogas was used as the fertilizer which reduced the pollution. Another advantage was the cowshed became clean because the cow waste was continuously flown and distributed to the digester, so the biogas could be used sustainably. Last but not least, the program could reduce the wood cutting so that the forest preservation was maintained well (Nasikh, 2017b; Nasikh and Moehariono, 2015).

The cow waste management to replace the fossil fuel gave a lot of advantages for the society, particularly for those who lived in the rural areas. From the economical aspect, the biogas indirectly helped the economic condition of the society. The biogas was used to replace the LPG, kerosene, and firewood so that the society could save more money. After using the biogas, they did not have to use LPG, kerosene, and firewood as the energy sources for their household. The saving they could make was approximately 120 thousand rupiahs. The average price of LPG was 20 thousand rupiahs, and in one month they purchased 5-6 LPGs. This insight was supported by another study conducted by Inderawati, et al. (2016). They explained that the biogas as the fossil fuel and firewood substitutions could save 150 thousand rupiahs per month with the average kerosene purchase of 15 liters, and 120 thousand rupiahs per month with the average firewood consumption of 60 bundles. In addition, Rachmawati, et al. (2017) argued that the biogas could save the energy purchase as much as 102 thousand rupiahs per month, with the average LPG use of 3 kilograms/ 5 days, 17 thousand rupiahs each. Zasriati (2018) also displayed the same finding. According to her, the household could save 5,485,000 rupiahs or approximately 176,935 rupiahs per month per household with the assumption of the fixed expenditure reduction, so it was $176,935 \times 12 = 2,123,225$ per year per household.

Furthermore, another advantage gained from the biogas was it could be used as the electrical energy replacement whose system was similar to *petromax* lamp. It could also be used as the semi-organic fertilizer to substitute the chemical fertilizer, so it could minimize the farmer dependency to the chemical fertilizer as well as reduce the chemical fertilizer purchase. The cow waste could be used and processed to be the new alternative energy through the development of biogas installation which benefitted the society. The research by Hariyati (2006) showed that the utilization of the cow waste to be the biogas could generate energy and fertilizer, so it could minimize and save the commercial energy consumption, such as kerosene and firewood. Next, Hamri, et al. (2017) showed a finding that the biogas implementation was a proof that *IPTEK Bagi Masyarakat* (IBM) or the Science and Technology for the Society have been applied well through the use of cow waste as the raw material for the alternative energy. This was proved by the distribution of biogas to one-eye and two-eye cookers. Another important point was that the waste could be used as the liquid and solid fertilizers.

From the social aspect, the biogas-based DME Program could give new knowledge to the society, especially the stock farmers, to manage the cow waste and generate biogas by applying the existing technology. In other words, it could change the farmers' attitude that used to litter the environment and neighborhood with the waste, and now they are able to utilize the waste wisely to be the biogas. As Oktavia & Firmansyah (2016) explained, the biogas technology utilization as the alternative fuel source could give the social advantage for the society by educating them about the cow waste that could give economic and environmental benefits.

CONCLUSION

The research finding shows that the biogas-based DME Program has not given significant effect to the society well-being in Bendosari Village, Pujon Sub district, Malang district. This is due to the fact that some local people have not been able to optimize the biogas program implementation. The social effect of this program includes the more harmonious relationship among the local people, the high awareness of the stock farmer to manage the cow waste to be the biogas, and the higher cooperation among them. In addition

to the social effect, there are also some environmental effects of the biogas-based DME Program. They include the reduced water, land, and air pollution, cleaner environment, better quality of environment, healthier society, cleaner cowshed, and reduced firewood cutting. Last but not least, the biogas-based DME program can also give benefit to the society in a way that it can replace LPG, firewood, kerosene, and electrical energy which leads to the saving from the fossil fuel purchase, not to mention to substitute the chemical fertilizer for the planting activity.

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REFERENCES

- BPS. 2017. *The number of Destitute Citizens, Percentage of Destitute Citizens, and Poverty Line. 1970-2017*, (Online), (<https://www.bps.go.id/statictable/2014/01/30/1494/jumlah-penduduk-miskin-persentase-penduduk-miskin-dan-garis-kemiskinan-1970-2017.html>), retrieved on 6 November 2017.
- Elizabeth, Roosganda & Rusdiana. 2011. *The Effectiveness of Biogas Utilization as Fuel to Resolve the Household Economic Cost in Rural Areas* (Online), (http://pse.litbang.pertanian.go.id/ind/pdfiles/Pros_MP_Rosganda_2011.pdf), retrieved on 19 November 2017
- Evi, Okta. 2017. *Program Performance Analysis: The Effect of DME Program Implementation to the Increased Biogas User Empowerment in Purworejo Village Sanankulon Sub District Blitar District*. Public Policy and Management Journal -Vol.5 No.1 2017.
- Hamidi. 2016. *The Renewable Energy*. Jakarta: KENCANA
- Hamri, Iskandar Hasan, and Muh Nawir. 2017. *The Implementation of Cow Waste Biogas Tools in Pattiro Deceng Village, Camba Sub district, Maros District*. Balireso Journal – Vol. 2 No. 1 2017
- Hariyati, Tuti. 2006. *Biogas: The Farming Waste that Becomes the Alternative Energy Source*. WARTAZOA Journal –Vol. 16 No. 3 2006
- Hastuti, Dewi. 2009. *The Implementation of Biogas Technology to Support the Stock Farmer Well-Being*. Agricultural Science Journal - Vol.5 No.1 2009
- Herryanti, Putri A. 2015. *The Management of Cow Waste to be Biogas*. Pawiyatan Science Journal – Vol. XXII No.1 2015
- Hublin, Andrea, Daniel Rolph Schneider, and Janko Dzodan. 2014. *Utilization of Biogas Produced by Anaerobic Digestion of AgroIndustrial Waste: Energy, Economic and Environmental Effects*. Sagepub: Waste Management and Research – Vol 32 No.7 2014
- Inderawati, Tati, Danang Biyatmoko, Muhammad Rizal, and Lilis Hartati. 2016. *Society Perception and Participation in the Biogas Development Program in Tamban Sub district Kapuas district*. EnviroScienteeae Journal Vol. 12 No. 3 2016.
- Jimmy and Hudha. MI. 2011. *The Potential of Biogas Utilization in Malang District, East Java*. Spectra Journal – Vol. IX No. 17 2011.

- The Ministry of Energy and Mineral Resources. 2009. *DME (Desa Mandiri Energi or the Energy Independent Village)*, (Online), (<https://www.esdm.go.id/id/media-center/arsip-berita/program-desa-mandiri-energi-dme-departemen-esdm>), retrieved on 9 November 2017
- Mulyono, Daru. 2000. *The Utilization of Farm Animal Waste as the Alternative Energy Source and the Improvement of Environmental Sanitation*. Environmental Technology Journal – Vol. 1 No. 1 2000 (<http://dx.doi.org/10.29122/jtl.v1i1.160>)
- Oktavia, Indri & Firmansyah, Adi. 2016. *The Utilization of Biogas Technology as the Alternative Fuel Source in the Operational Area of PT Pertamina EP Asset 2*. CARE Journal – Vol. 1 No.1 2016
- Nasikh (2017a). An Analysis of Factors Affecting Indonesian's Economic Growth. *International Business Management*, 11(3), 802– 806.
- (2017b). Institutional Model and Activities of Destitute Society around Forest as an Attempt to Develop the Sustainable and Equitable Forest in East Java, Indonesia. *Periodica Polytechnica Social and Management Sciences*, 25(1), 8–16.
- (2016). Developing Ecotourism as an Attempt to Improve the Competitiveness in the Economic Globalization Era in Banyuwangi Regency, East Java Province. *International Journal of Economic Research*, 7, 2735–2750.
- (2014). Horizontal Management of Forest Resources to Enhance the Partnership and Accountability in Pasuruan, East Java, Indonesia. *Asian Journal of Humanities and Social Studies*, Retrieved from <http://ajouronline.com/index.php/AJHSS/article/view/1591/890>.
- (2013). A Model of Collaborative Forest Resources Management to Improve the Prosperity of Poor Family Farmers in East Java. *Indonesian Journal of Geography*, 45(1), 80–89.
- Nasikh, H. L., & Moehersono, M. (2015). *The Local Government Policy to Maintain the East Java Food Security Leading to Imported Rice-Free* (Joint Research between the Balitbang of East Java Province and the State University of Malang). Unpublished Research Report.
- Pranoto, Alvini. 2009. *Science & Technology of Various Ideas to Answer the Challenge and Needs of Research and Technology*. Jakarta: PT. Gramedia Pustaka Utama
- Rachmawati RA, Wahjoedi Wahjoedi & Sri Umi Mintarti Widjaja. 2017. *The Meaning of Biogas as the Household Energy Source*. Education Journal – Vol. 2 No.4 2017
- Rambe, Armaini, Hartoyo Hartoyo & Emmy S Karsin. 2008. *The Analysis of Expenditure and Family Well-Being Level (Study in Medan Kota Sub district, North Sumatera)*. Family & Consumer Science Journal – Vol.1 No.1 2008 (<http://dx.doi.org/10.24156/jikk/2008.1.1.16>)
- Singh, Manjeshwori & Maharjan, Keshav Lall. 2003. *Contribution of Biogas Technology in Well-being of Rural Hill Areas of Nepal: A Comparative Study Between Biogas Users and Non-users*. Journal of International Development and Cooperation-Vol.9 No.2 2003
- Widianingsih, Wiwien. 2014. *The Society Participation through the Cow Waste Biogas-Based DME Program in Haurngombong Village, Pamulihan Sub district, Sumedang District*. Administration Science Journal – Vol.6 No.1 2014

- Wiyono, Gandjar. 2014. *The Implementation of Biogas-Based DME Program to Empower the Society in Sidomulyo Village, Pagerwojo Sub district, Tulungagung District*. Public Administration Journal – Vol. 2 No. 5 2014
- World Bank. 2015.” <http://www.worldbank.org/>”. *Indonesia Population Total*. Retrieved on November 8, 2017. <https://data.worldbank.org/country/indonesia>
- Yuwono, Istantyo & Sidqon, Moch. 2014. *The Biogas Digester Development to Resolve the Social Turmoil in Sukodono Sidoarjo Society*. Industrial Engineering Journal – Vol. 11 No. 2 2014
- Zasriati, Masrida. 2018. *The Analysis of Animal Farm Utilization for Biogas to Reduce the Household Expenditure in Giri Mulyo Village, Kayu Aro Barat Sub district*. AKRAB JUARA Journal – Vol.3 No.1 2018

APENDIX

ATTACHMENT

A Comprehensive Interview Guideline to the Village Headman and KPTK Leader (Kelompok Pelaksanan Teknik Kegiatan)

Question List:

1. What background underlies the establishment of biogas-based DME Program by the local government?
2. What is the purpose of the biogas-based DME Program?
3. Since when did the biogas-based DME begin?
4. Where is the fund to run the program from?
5. Who is the target of the biogas-based DME Program?
6. How does the local government socialize the biogas-based DME Program?
7. How is the society's response toward the biogas-based DME Program?
8. What obstacle is encountered during the implementation of the biogas-based DME Program?
9. What is the effect of the biogas-based DME Program to the social condition of the society?
10. What is the effect of the biogas-based DME Program to the environmental condition of the society?
11. What advantages that the society obtains from the biogas-based DME Program?
12. What is the future plan to develop the biogas-based DME Program?
13. In your opinion, how to identify if the individual/society is prosperous?
14. In your opinion, how to identify if the individual/society is not prosperous?

Comprehensive Interview Guideline to Biogas Users

Question List

1. Since when did your family use the biogas?
2. What do you think about the biogas-based DME Program?
3. How is your social relationship with the society or your neighbor after the existence of biogas-based DME Program?
4. What is the environmental effect of the biogas-based DME Program?
5. What advantages that you obtain from the biogas-based DME Program?

Comprehensive Interview Guideline to Non-Biogas Users

Question List

1. Do you know that Bendosari Village implements the biogas-based DME Program?
2. How do you know the biogas-based DME Program?
3. What do you think about the biogas-based DME Program?
4. What social effect do you feel after the implementation of the biogas-based DME Program?
5. Do you feel any effect/change in your environment after the implementation of the biogas-based DME Program?

TABLE 2 Data of Prosperity Level of Informant 3

BKKBN Indicator	Question Number	Before		After		Note
		Yes	No	Yes	No	
Pre-prosperous Family		Yes	No	Yes	No	To Be RT Leader
Pre-prosperous Family	1	√		√		
Prosperous Family 1	2	√		√		Does not have 5 to 15 years old children

TABLE 3 Data of Prosperity Level of Informant 4

BKKBN Indicator	Question Number	Before		After		Note
		Yes	No	Yes	No	
Pre-prosperous Family		Yes	No	Yes	No	Has been menopause and lives with his wife
	1	√		√		Does not have 5 to 15 years old children
	2	√		√		No fertile-aged spouse
	3	√		√		Mostly in the form of goods
	4	√		√		No need to search for the firewood because there is the biogas.

TABLE 4 Data of Prosperity Level of Informant 5

BKKBN Indicator	Question Number	Before		After		Note
		Yes	No	Yes	No	
		Yes	No	Yes	No	Her first child is in the first grade of junior high school
Pre-prosperous Family	1	√		√		
	2	√		√		No need to search for firewood

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