The Influence Public Knowledge and Perception Regarding Use Alternative Energy Sources Based Biofuels

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Abstract: Indonesia is one of the countries that depend on fossil-based fuels as a good source of energy. Until now, the portion of fossil energy use has reached more than 80% in the national primary energy mix. From these data, it is clear that dependence on fossil energy in Indonesia is still high. This study aims to describe the knowledge and perceptions of the people of Jambi City about the prospect of using alternative energy sources based on biofuels. And to find out whether there is an influence between knowledge and people's perceptions of Jambi City about the prospect of using biofuel-based alternative energy sources. This study uses the type of mix method. The instruments used in this study were questionnaires and interviews. The results obtained are that the community perception value in Jelutung sub-district regarding biofuel-based alternative energy is higher than the community in Pasar Jambi sub-district. People in Pasar Jambi Sub-district have knowledge about alternative energy based on biofuel which is superior to people in Jelutung sub-district.

Keywords: Biofuels; Knowledge; Perception

Introduction

Indonesia is one of the countries that also depends on fossil-based fuels that are used as energy sources both in terms of the transportation and industrial sectors (Rivani et al., 2022; Syaiful et al., 2021; Yantoro et al., 2021). Until now, the portion of fossil energy use has reached more than 80% in the national primary energy mix. From these data, it is clear that dependence on fossil energy in Indonesia is still high. Even though there has been a reduction in emissions due to the COVID-19 pandemic, which reduces community mobility as well as industrial and commercial sector activities. Meanwhile, the supply of fuel is limited so that to meet domestic fuel needs, Indonesia requires the import of fuel oil (Arlianti, 2018; Kamid, Syafmen, et al., 2022; Wiratmaja & Elisa, 2020). To reduce dependence on fossil fuels whose availability is dwindling, steps can be taken by developing environmentally friendly alternative fuels. This alternative energy source is developed in addition to reducing dependence, it is also needed to maintain a sustainable environment.

Petroleum is one of the most important resources and has various benefits, as the name suggests, petroleum comes from various forms of organisms that die in the soil (Erfando et al., 2019; Kamid, Winarni, et al., 2022; Rosema et al., 2021). The availability of petroleum is getting less and less, this can lead to conflicts within society and the state (Fitria Wati et al., 2020; Handrianto, 2018; Lisa Cintya Lendeng et al., 2021). Therefore, a solution is needed to overcome the problems that occur in petroleum. So that the government provides a solution, namely the use of alternative energy as a substitute for fossil fuels.

In general, biofuel is a fuel from material or biomass derived from animals and tends to come from plants (Ganesan et al., 2020; Malode et al., 2021; Rodionova et al., 2016). There are several types of biofuels, namely bioethanol, biodiesel, and biogas(Alalwan et al., 2022; Hossain et al., 2019; Ramanavicius & Ramanavicius, 2021). First, bioethanol is alcohol from plants such as wheat, sugar cane, corn to vegetable waste. Both biodiesel are fuels made from soybean oil, castor fruit to sunflower oil. Then the last one is biogas which is used to turn on electricity or stove. The use of biogas is much cleaner than coal, and the energy obtained is greater and less carbon dioxide.

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Perception is one of the important psychological aspects for humans to react to various aspects and symptoms in their environment(Anisah et al., 2020; Pratama, 2019; Sudirman & Fahriza, 2018). It is very important to know the community's perception in order to know the scope, level of awareness and impact of the sustainable program management function. We can know how a person selects, organizes and interprets knowledge and experience through perception. Using community insights, it is possible to characterize trends in the state and use of natural resources as well as to gain insights into the equity, efficiency and sustainability of management interventions(Aisah & Herdiansyah, 2019; Anisah et al., 2020; Hidayat et al., 2020).

The results obtained from sensing certain objects are called knowledge(Damayanti et al., 2021; Ganesan et al., 2020). Knowledge is material memory related to relating large collections of material from things studied and detailed by theory, but provided using appropriate memory and knowledge(Malode et al., 2021; Sholeha et al., 2022; T et al., 2020). Knowledge is the result of remembering something, including remembering intentionally or unintentionally an event, and this happens after people touch or observe a certain object. The success of the biofuel development program planned by the government in the future depends on the role of the community. The role of the community is determined by the common knowledge and public perception about the prospect of using alternative energy sources based on biofuels. There is no data regarding public knowledge and perception about the prospect of using biofuel-based alternative energy sources. So the importance of this research is to invite the community to work together in the success of the planned biofuel development program.

This research is in line with previous research, where previous research discussed the perception of coastal communities towards the use of alternative energy for fishing. The results obtained from this study indicate that the community's perception of the existence of biodiesel is very high (72.50%) while 27.50% of fishermen are still hesitant (Mira & Zulkarnen, 2008). Where the results obtained are that the community has a perception that nyamplung is suitable to be developed for environmental functions, namely as a windbreak, which protects agricultural land near the sea to remain productive (Sanudin, 2020). Alternative energy based on biofuels. And to find out whether there is an influence between knowledge and people's perceptions of Jambi City about the prospect of using biofuel-based alternative energy sources.

Method

This study uses the type of mix method. Mix method research uses a mixture of qualitative and quantitative research (Tegeh et al., 2020). Quantitative is usually used with an amount that can be measured such as the Likert scale value of the questionnaire given to the respondent (Vansteensel et al., 2017). The function of this quantitative is to test a hypothesis in research, collect and analyze data that is used systematically. Meanwhile, qualitative is usually used by observing phenomena and the sharpness of qualitative research is greatly affected by the strength of the words and sentences used(Banks et al., 2018).

This study used the subject of a pilot study in the community living in the Jelutung sub-district and the Jambi market district in the city of Jambi. The subjects taken consisted of individual groups or clusters, with the characteristics of the respondents presented in the following table.

Table 1. Demographic Characteristics of Research Respondents

Description	Characteristics
Gender	Male and female
Age	17 to 60 years
Education	SMA to S3
Work	-Laborer
	- Freelancer
	-Housewife
	-Private sector employee
	-Trader
	- Student/Student
	-Farmer
	- civil servants
	- Police/TNI
	-Self-employed

Purposive sampling is a sampling technique taken according to certain criteria. The criteria determined are male or female people who have an age range of 17 to 60 years. The total number of respondents taken is 100 respondents. The instruments used in this study were questionnaires and interviews. The number of perception and knowledge questionnaire questions given to the community is 15 questions each. The categories of public perception are as follows.

Table 2. Intervals and Categories of Community Perception Assessment Instruments

Category	Indicator Interval	
	Learning aspect	Material Aspect
Very Not Good	5.0-9.0	5.0-9.0
Not good	10.0-13.0	10.0-13.0
Enough	14.0-17.0	14.0-17.0
Well	18.0-21.0	18.0-21.0
Very good	22.0-25.0	22.0-25.0

The Likert scale used in this instrument is 5 points with categories namely very good (5), good (4), moderate (3), not good (2), and very bad (1).

Data collection techniques were carried out by distributing questionnaires and interviews. The types of

data obtained in this development research are in the form of qualitative data and quantitative data. Qualitative data was generated from interviews with people living in Jelutung and Pasar Jambi sub-districts. The research procedure was carried out by distributing questionnaires and interviews. The results of the data obtained after that were collected according to the type of method used. After that, it is analyzed according to the type of data collection, if the data is quantitative, then the data is analyzed using tests such as descriptive statistical tests, assumption tests in the form of normality and linearity tests and hypothesis testing in the form of regression tests and for qualitative types, interview results will be analyzed. Then after testing and

analyzing the results of qualitative data, conclusions will be obtained. The research process carried out can be seen in Figure 1.

Figure 1. Research procedure

Result and Discussion

Result

Tests carried out before the assumption test were descriptive statistical tests. The results of the descriptive test carried out are as follows.

Table 3. Results of descriptive statistical tests on community knowledge and perceptions of alternative energy sources based on biofuels in Jelutung District

Student response		Interval	F	Persentase	Category	Mean	Median	Min	Max
Percepti on	Aspect Learning	5.0-9.0	0	0%	Very Not Good				
		10.0-13.0	5	5%	Not good				
		14.0-17.0	30	30%	Enough				
		18.0-21.0	49	49%	Good	3.55	3.50	3.00	5.00
		22.0-25.0	16	16%	Very good				
	Material Aspect	5.0-9.0	0	0%	Very Not Good				
		10.0-13.0	0	0%	Not good				
		14.0-17.0	20	20%	Enough				
		18.0-21.0	73	73%	Good	3.55	3.50	3.00	5.00
		22.0-25.0	7	7%	Very good				
Knowledge		5.0-9.0	0	0%	Very Not Good				
		10.0-13.0	33	33%	Not good				
		14.0-17.0	56	56%	Enough				
		18.0-21.0	11	11%	Good	3.65	4.00	2.00	4.00
		22.0-25.0	0	0%	Very good				

From the results obtained, it is explained that the community's perception of alternative energy sources based on biofuel as a whole is in the community's material aspect is superior to the learning aspect where

the highest percentage reaches 73% in the good category. In addition, the knowledge is quite sufficient with a percentage of 56%.

Table 4. Results of descriptive statistical tests on community knowledge and perceptions of alternative energy sources based on biofuels in Pasar Jambi District

Student response		interval	F	Persentase (%)	Category	Mean	Median	Min	Max
Perception	Aspect Learning	5.0-9.0	0	0	Very Not Good				
		10.0-13.0	0	0	Not good				
		14.0-17.0	30	30	Enough				
		18.0-21.0	62	62	Good	3.55	3.50	3.00	5.00
		22.0-25.0	8	8	Very good				
	Material Aspect	5.0-9.0	0	0	Very Not Good				
		10.0-13.0	0	0	Not good				
		14.0-17.0	17	17	Enough				
		18.0-21.0	71	71	Good	3.55	3.50	3.00	5.00
		22.0-25.0	8	8	Very good				
Knowledge			0	0	Very Not Good				
		10.0-13.0	0	0	Not good				
		14.0-17.0	61	61	Enough				
		18.0-21.0	25	25	Good	3.65	4.00	2.00	4.00
		22.0-25.0	14	14	Very good				

Based on biofuel as a whole is in the community's material aspect which is superior to the learning aspect, with the highest percentage reaching 71% in the good category. In addition, his knowledge is quite sufficient with a percentage of 61%.

1. *Assumption Test*

Table 5. Normality Test

| | | Kolmogorov-Smirnova | | | | Shapiro-Wilk | |
	Class	Statistic	Df	Sig.	Statistic	df	Sig.
Perception	Kecamatan Jelutung	.054	100	.200*	.982	100	.771
	Kecamatan Pasar Jambi	.050	100	.200*	.983	100	.814
Knowledge	Kecamatan Jelutung	.055	100	.200*	.972	100	.521
	Kecamatan Pasar Jambi	.053	100	.200*	.950	100	.121

The results obtained on the perception and knowledge of the community regarding alternative energy sources based on biofuel that the significant value for Kolmogorov-Smirnov is 0.200. The results of linearity are as follows.

Table 6. Linear test between perceptions and knowledge of the people of Jelutung sub-district (ANOVA Table)

			Sum of Squares	df	Mean Square	F	Sig.
Perception* Knowledge of the people of Jelutung sub-district	Between Groups	(Combined)	696.363	25	38.687	1.652	.165
		Linearity	3.471	1	3.471	.148	.706
		Deviation from Linearity	692.892	24	40.758	1.741	.143
	Within Groups		351.167	16	23.411		
	Total		1047.529	44			

Based on table 6, it can be concluded that there is a linear relationship between the perception and knowledge of the people of the Jelutung sub-district obtained, the results of the linearity test obtained are a significance value of 0.143 which has met the requirements > 0.05.

Table 7. Linear test between perceptions and knowledge of the people of Pasar Jambi sub-district

			Sum of Squares	df	Mean Square	F	Sig.
Perception* Knowledge of the people of Pasar Jambi sub-district	Between Groups	(Combined)	1551.167	24	81.640	3.045	.998
		Linearity	319.504	1	319.504	11.918	.315
		Deviation from Linearity	1231.663	23	68.426	2.552	.980
	Within Groups		375.333	17	26.810		
	Total		1926.500	44			

Based on table 7, it can be concluded that there is a linear relationship between the perception and knowledge of the people of the Pasar Jambi sub-district. The results of the linearity test obtained are a significance value of 0.980 and has met the requirements > 0.05.

2. *Hypothesis testing*

After testing the assumptions, it can be continued to test the hypothesis. The hypothesis test used is a regression test. The results of the regression test are as follows.

Table 8. Regression test between perceptions and knowledge of the people of Jelutung sub-district

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
(Constant)		28764.7	4229.248.063		6.801	.000
Knowledge		.691	.059	.993	10.983	.000
Perception		.673		.789	10.526	.000

From the results obtained that the resulting significant value is not more than 0.05. This means that there is an influence between knowledge and perception regarding the use of

alternative energy sources based on biofuel in the Jelutung sub-district community.

Table 9. Regression test between perceptions and knowledge of the people of Pasar Jambi sub-district

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
(Constant)		25358.3	4525.422		2.108	.040
Knowledge		.485	.083	.405	2.936	.045
Perception		.392	.079	.350	2.256	.038

From the results obtained that the resulting significant value is not more than 0.05. This means that there is an influence between knowledge and perception regarding the use of alternative energy sources based on biofuel in the Pasar Jambi sub-district community.

3. Interview

The interview conducted asked 3 questions to representatives of the community living in Jelutung and Pasar Jambi sub-districts. The initials used in community 1 are people from Jelutung sub-district and community 2 are people from Pasar Jambi sub-district.
Researcher : Do you know what biofuel is?
Society 1: Little understanding
Society 2: don't really understand
Researcher : Explain what is known about alternative resources based on biofuels?
Community 1: Like using palm oil as the main crop in producing
biodiesel from plants.
Community 2: making fuel derived from plants and animal waste for
engine drive or heater.
Researcher: What can be the impact of this application?
Society 1: I can
Community 2: Probably yes
Researcher: What impact can be generated from the application?
Society 1: the impact on the atmosphere due to the plants that are the source
Community 2: in the development of plants for biofuels need to use land. Then
Forests can be replaced with biofuels, this of course makes less CO2 be absorbed.

Discussion

Based on the results above, it can be seen that in the Jelutung sub-district, the community's perception of alternative energy sources based on biofuel as a whole is superior to the material aspect of the community, with the highest percentage reaching 73% in the good category. As for the Pasar Jambi District, the results obtained are in public perception of alternative energy sources based on biofuel as a whole, the material aspect of the community is superior to the learning aspect, with the highest percentage reaching 71% in the good

category. This indicates that the community perception value in Jelutung sub-district regarding biofuel-based alternative energy is higher than the community in Pasar Jambi sub-district.

Based on the results above, it can be seen that the people in Jelutung Sub-district have sufficient knowledge of alternative energy based on biofuels with a percentage of 56%. Meanwhile, the community in Pasar Jambi District can know that their knowledge of biofuel-based alternative energy is also quite sufficient with a percentage of 61%. However, the community in Pasar Jambi sub-district has a higher percentage of knowledge about biofuel-based alternative energy than the people in Jelutung District. This indicates that the community in Pasar Jambi District has knowledge of alternative biofuel-based energy that is superior to the community in Jelutung sub-district.

Based on the results obtained on the perception and knowledge of the community regarding alternative energy sources based on biofuels, the significant value for Kolmogorov-Smirnov is 0.200. which means that the data has no significant difference and the data is normal. In table 4 above, it can be seen that there is a linear relationship between the perception and knowledge of the people of the Jelutung sub-district obtained, the results of the linearity test obtained are a significance value of 0.143 which has met the requirements > 0.05. And in table 5 it can be seen that there is a linear relationship between the perception and knowledge of the Pasar Jambi district community with the linearity test results obtained, a significance value of 0.980 has met the requirements > 0.05.

Based on the results obtained in the hypothesis test above, it can be seen that for Jelutung District the significant value produced is not more than 0.05. This means that there is an influence between knowledge and perception regarding the use of alternative energy sources based on biofuel in the Jelutung sub-district community. And the significant value generated for Pasar Jambi sub-district is also not more than 0.05. This means that there is an influence between knowledge and perception regarding the use of alternative energy sources based on biofuel in the Pasar Jambi sub-district community.

Based on the results of interviews conducted in Jelutung District and Pasar Jambi District. There were 4

questions that were asked to the community with the initials of community 1 from Jelutung District and community 2 from Jambi Market. From the results of these interviews, it can be seen that the public's understanding of biofuels is still very small. They only know about biofuels in general. From the results of the interview, the interviewees also explained about the use of palm oil and animal dung to be used as biofuel resources. Biofuels also have several impacts on the environment. Such as having an impact on the atmosphere and also the lack of plant populations so that less CO2 will be absorbed. This statement is supported by the statement stated by Akhirul et al. (2020) that disturbance of forests and other ecosystems can reduce their ability to absorb CO2 in the atmosphere.

This research is in line with research conducted by Sanudin & Hut (2020) entitled "Perception and Attitude of Community towards the Development of Nyamplung in Patutrejo Village, Purworejo District". And the research aims to determine the public's perception and attitude towards the development of nyamplung. However, what distinguishes this research from this research is that the research conducted by Sanudin & Hut focuses on research on people's perceptions and attitudes, while this research focuses on people's perceptions and knowledge.

This research is also in line with the research conducted by Atmaja et al (2021) entitled "Utilization of Sawdust Waste into Alternative Biofuel-Pellet Fuel". And the research aims to provide insight, improve skills and the desire to make their own alternative fuels. Also to accelerate changes in the behavior of people who are dependent on kerosene and LPG. However, what distinguishes it from this research is the focus of the research on providing understanding and knowledge to the public regarding biofuels, while in this study the focus of research is more on how far the community's knowledge of alternative energy sources based on biofuels is.

So far, there have been no articles that have examined descriptive statistical data on people's knowledge and perceptions about alternative energy sources based on biofuels. As well as the influence and knowledge of the community on alternative energy sources in Pasar Jambi and Jelutung sub-districts as discussed in this article. This article presents descriptive statistical data on the perception and knowledge of the people of Jelutung and Pasar Jambi Districts regarding alternative energy sources based on biofuels. It also examines the effect of public knowledge and perceptions.

Conclusion

Based on the explanation above, it can be concluded that the community perception value in Jelutung sub-district regarding biofuel-based alternative energy is higher than the community in Pasar Jambi sub-district. And the level of knowledge about alternative energy sources based on biofuel in the community in Pasar Jambi sub-district is higher than the community in Jelutung District. And from the results of the interview, it can also be seen that the understanding and knowledge of the community about alternative energy sources based on biofuels is still relatively low.

References

Aisah, I. U., & Herdiansyah, H. (2019). Strategi pemberdayaan masyarakat dalam pelaksanaan program desa mandiri energi 1. *Share: Social Work Jurnal*, *9*(2), 130–141. https://doi.org/10.24198/share.v9i2.21015

Akhirul, A., Witra, Y., Umar, I., & Erianjoni, E. (2020). Dampak Negatif Pertumbuhan Penduduk Terhadap Lingkungan Dan Upaya Mengatasinya. Jurnal Kependudukan Dan Pembangunan Lingkungan, 1(3), 76-84.

Alalwan, H. A., Alminshid, A. H., & Aljaafari, H. A. S. (2022). Promising evolution of biofuel generations . Subject review. *Reinforced Plastics*, *28*(00),127–139. https://doi.org/10.1016/j.ref.2018.12.006

Anisah, N., Manan, A., Fatin, N., Ab, A., Wei, D. C., Ahmad, A., & Janor, H. (2020). *Persepsi dan faktor yang mempengaruhi pembelian minyak sawit dalam kalangan pengguna domestik dan antarabangsa*. *17*(8), 165–189.

Arlianti, L. (2018). Bioetanol Sebagai Sumber Green Energy Alternatif yang Potensial Di Indonesia. *Unistek*, *5*(1), 16–22. https://doi.org/10.33592/unistek.v5i1.280

Atmaja, J., Natalia, M., & Sari, D. (2021). Pemanfaatan Limbah Serbuk Gergaji Menjadi Bahan Bakar Alternatif Biofuel-Pellet. *Jurnal Abdimas: Pengabdian dan Pengembangan Masyarakat*, *3*(1), 20-23.

Banks, H. T., Flores, K. B., Langlois, C. R., Serio, T. R., & Sindi, S. S. (2018). Estimating the rate of prion aggregate amplification in yeast with a generation and structured population model. *Inverse Problems in Science and Engineering*, *26*(2), 257–279. https://doi.org/10.1080/17415977.2017.1316498

Damayanti, F., Supriyatin, T., & Biologi, S. P. (2021). *Pemanfaatan Limbah Minyak Jelantah Sebagai Upaya Peningkatan Kepedulian Masyarakat Terhadap Lingkungan*. *5*(1), 161–168.

Erfando, T., Khalid, I., & Safitri, R. (2019). Studi Laboratorium Pembuatan Demulsifier dari Minyak Kelapa dan Lemon untuk Minyak Kelapa dan Lemon untuk Minyak Bumi pada Lapangan x di Provinsi Riau. *Teknik*, *40*(2), 129. https://doi.org/10.14710/teknik.v39i3.23656

Fitria Wati, A., Yulistia Erwan, E., & Azizah, N. (2020).

Industri Pengolahan Minyak Bumi Di Indonesia. 1–29.

Ganesan, R., Manigandan, S., Samuel, M. S., Shanmuganathan, R., Brindhadevi, K., Thuy, N., Chi, L., & Anh, P. (2020). A review on prospective production of biofuel from microalgae. *Biotechnology Reports*, *27*, e00509. https://doi.org/10.1016/j.btre.2020.e00509

Handrianto, P. (2018). Mikroorganisme Pendegradasi Tph (Total Petroleum Hydrocarbon) Sebagai Agen Bioremediasi Tanah Tercemar Minyak Bumi (Review Article). *Jurnal SainHealth*, *2*(2), 35. https://doi.org/10.51804/jsh.v2i2.287.35-42

Hidayat, Y. V., Apriyanto, E., & Sudjatmiko, S. (2020). Persepsi Masyarakat Terhadap Program Percetakan Sawah Baru Di Desa Air Kering Kecamatan Padang Guci Hilir Kabupaten Kaur Dan Pengaruhnya Terhadap Lingkungan. *Jurnal Penelitian Pengelolaan Sumberdaya Alam Dan Lingkungan*, *9*(1), 41–54.

Hossain, N., Mahlia, T. M. I., & Saidur, R. (2019). Biotechnology for Biofuels Latest development in microalgae - biofuel production with nano - additives. *Biotechnology for Biofuels*, 1–16. https://doi.org/10.1186/s13068-019-1465-0

Kamid, K., Winarni, S., Rohati, R., Rivani, P. A., & Azzahra, M. Z. (2022). The Comparison of Jigsaw Cooperative Learning Model with STAD on Mathematics Subjects in Junior High School. *Journal of Education Research and Evaluation*, *6*(1), 118–130. https://doi.org/10.23887/jere.v6i1.40425

Kamid, Syafmen, W., Fajriah, N., Citra, Y. D., Rivani, P. A., & Widodo, R. I. (2022). Investigating the Role of Traditional Games in Developing Students' Process Skills and Interest in Learning mathematics. *Eurasian Journal of Educational Research*, *2022*(97), 216–234. https://doi.org/10.14689/ejer.2022.97.12

Lisa Cintya Lendeng, Brave Angkasa Sugiarso, & Arthur Mourits Rumagit. (2021). Media Interaktif Berbasis Animasi Pada Materi Minyak Bumi Untuk Kelas XI Sekolah Menengah. *Jurnal Teknik Elektro Dan Komputer*, *16*(2), 183–192.

Malode, S. J., Prabhu, K. K., Mascarenhas, R. J., Shetti, N. P., & Aminabhavi, T. M. (2021). Energy Conversion and Management : X Recent advances and viability in biofuel production. *Energy Conversion and Management: X*, *10*(September 2020), 100070. https://doi.org/10.1016/j.ecmx.2020.100070

Mira, M., & Zulkarnen, R. (2008). Persepsi Masyarakat Pesisir Terhadap Penggunaan Energi Alternatif Untuk Melaut. *Jurnal Sosial Ekonomi Kelautan Dan Perikanan*, *3*(2), 233. https://doi.org/10.15578/jsekp.v3i2.5855

Pratama, A. D. (2019). *Post Truth Dalam Perseteruan Indonesia-Uni Eropa Mengenai Isu Kelapa Sawit Post Truth in Indonesia-European Union Dispute Over Palm Oil Issue*. *10*(2), 95–112.

Ramanavicius, S., & Ramanavicius, A. (2021). Conducting Polymers in the Design of Biosensors and Biofuel Cells. *Polymers*, *13*(49), 1–19.

Rivani, P. A., Kurniawan, D. A., & Yohafrinal, Y. (2022). *Pengaruh Minat Belajar Terhadap Prestasi Belajar Fisika Pada Siswa Di Sman 11 Kota Jambi*. *5*(1), 143–150.

Rodionova, M. V, Poudyal, R. S., Tiwari, I., & Voloshin, R. A. (2016). ScienceDirect Biofuel production : Challenges and opportunities. *International Journal of Hydrogen Energy*, 1–12. https://doi.org/10.1016/j.ijhydene.2016.11.125

Rosema, R., Supriyantini, E., & Sedjati, S. (2021). Pemanfaatan Kitosan untuk Menurunkan Kadar Logam Pb dalam Perairan yang Tercemar Minyak Bumi. *Buletin Oseanografi Marina*, *10*(1), 61–66. https://doi.org/10.14710/buloma.v10i1.31051

Sanudin, S., & Hut, S. (2020). Perception and Attitude of Community towards the Development of Nyamplung in Patutrejo Village, Purworejo District. *Jurnal Agroforestri Indonesia*, *3*(1), 55-66.

Sanudin. (2020). Persepsi dan Sikap Masyarakat terhadap Pengembangan Nyamplung di Desa Patutrejo, Kabupaten Purworejo (Perception and Attitude of Community towards the Development of Nyamplung Energi kerjasama antara Kementerian Energi. *Jurnal Agroforestri Indonesia*, *3*(1), 55–56.

Sholeha, D., Zambak, M. F., & ... (2022). The Implementasi ANFIS Dalam Prakiraan Perkembangan Energi Baru dan Terbarukan di Indonesia Pada Tahun 2030. *Jurnal Sistem Informasi …*, *5*(2), 1–4. http://jurnal.unprimdn.ac.id/index.php/JUSIKOM/article/view/2503%0Ahttp://jurnal.unprimdn.ac.id/index.php/JUSIKOM/article/download/2503/1552

Sudirman, Y., & Fahriza, M. (2018). Persepsi masyarakat terhadap konversi lahan menjadi perkebunan kelapa sawit di desa nanga tayap kecamatan nanga tayap kabupaten ketapang. *JURNAL HUTAN LESTARI*, *6*(4), 742–751.

Syaiful, Kamid, Kurniawan, D. A., & Rivani, P. A. (2021). The impact of project-based learning on students' achievement in mathematics. *Journal of Educational Research and Evaluation*, *5*(4), 558–567. https://doi.org/10.48081/kxbi5168

T, D. W. N., Suwarto, & Lestari, E. (2020). Pemberdayaan masyarakat melalui pengembangan desa mandiri energi (Studi kasus di Klaten Jawa Tengah). *Seminar Nasional Pemberdayaan Masyarakat*, *2*, 201–206.

Tegeh, I. M., Parwata, I. G. L. A., & Ostaviani, B. G. (2020). The Observing Learning Activity Assisted by Concrete Media Improves Student's Conceptual Knowledge. *JPI (Jurnal Pendidikan Indonesia)*, *9*(2),

182. https://doi.org/10.23887/jpi-undiksha.v9i2.25206

Vansteensel, M. J., Kristo, G., Aarnoutse, E. J., & Ramsey, N. F. (2017). The brain-computer interface researcher's questionnaire: from research to application. *Brain-Computer Interfaces*, *4*(4), 236–247. https://doi.org/10.1080/2326263X.2017.1366237

Wiratmaja, I. G., & Elisa, E. (2020). Kajian Peluang Pemanfaatan Bioetanol Sebagai Bahan Bakar Utama Kendaraan Masa Depan Di Indonesia. *Jurnal Pendidikan Teknik Mesin Undiksha*, *8*(1), 1. https://doi.org/10.23887/jptm.v8i1.27298

Yantoro, Y., Kurniawan, D. A., Perdana, R., & Rivani, P. A. (2021). A Survey of Process Skills Mathematics Learning in Elementary School. *Jurnal Pendidikan Dan Pengajaran*, *54*(3), 467–474. https://doi.org/10.23887/jpp.v54i3.37180