



The Effect of Knowledge and Perceptions on the Prospect of Using Biofuel-Based Alternative Energy Sources

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ABSTRAK

Kebutuhan energi Indonesia setiap tahunnya meningkat sejalan dengan pertumbuhan ekonomi dan jumlah penduduk. Indonesia masih perlu berupaya untuk mencapai target pembangunan di bidang energi hingga saat ini. Ketergantungan terhadap energi fosil, khususnya minyak bumi, masih tinggi untuk memenuhi konsumsi energi dalam negeri. Cadangan energi tak terbarukan seperti minyak bumi, gas alam, dan batu bara sangat mengkhawatirkan karena semakin menipis. Urgensi dalam penelitian ini sangat penting karena jarang ada penelitian yang membandingkan antara Pengetahuan dan Persepsi tentang Prospek Pemanfaatan Sumber Energi Alternatif Berbahan Bakar Nabati. Penelitian ini bertujuan untuk menganalisis pengaruh pengetahuan dan persepsi tentang Prospek Pemanfaatan Sumber Energi Alternatif Berbahan Bakar Nabati. Metode penelitian ini adalah metode campuran, dengan teknik pengambilan sampel dalam penelitian ini adalah multistage random sampling. Jumlah responden sebagai sampel adalah 100 responden. Instrumen pengumpulan data yang digunakan berupa angket, wawancara mendalam, dan dokumentasi. Analisis data dalam penelitian ini dibagi menjadi pengujian statistik deskriptif (mean, median, min, dan max) dan inferensial (regresi sederhana). Hasil uji regresi menunjukkan adanya pengaruh Pengetahuan dan Persepsi tentang Prospek Pemanfaatan Sumber Energi Alternatif Berbahan Bakar Nabati.

ABSTRACT

Indonesia's energy needs each year increase in line with economic growth and population. Indonesia still needs to work on achieving its development targets in the energy sector to date. Dependence on fossil energy, especially petroleum, is still high to meet domestic energy consumption. Non-renewable energy reserves such as oil, natural gas, and coal are very worrying because they run low. The urgency in this study is very important because there are rarely studies that compare the Knowledge and Perceptions about the Prospects of Utilizing Biofuel-Based Alternative Energy Sources. This study aims to analyze the effect of knowledge and perceptions about the Prospects of Utilizing Biofuel-Based Alternative Energy Sources. This research method is a mixed method, with the sampling technique in this study being multistage random sampling. The number of respondents as a sample is 100 respondents. The data collection instruments used were in the form of questionnaires, in-depth interviews, and documentation. Data analysis in this study is divided into descriptive statistical testing (mean, median, min, and max) and inferential (simple regression). The regression test results show an influence of Knowledge and Perception about the Prospects of Utilizing Biofuel-Based Alternative Energy Sources.

1. INTRODUCTION

Indonesia's energy needs each year increase in line with economic growth and population. Indonesia still needs to work on achieving its development targets in the energy sector to date. Dependence on fossil energy, especially petroleum, is still high to meet domestic energy consumption. Non-renewable energy reserves such as oil, natural gas, and coal are very worrying because they run low (Sa'adah et al., 2017; Septiadi et al., 2009; Widayana, 2012). Meanwhile, Indonesia's fuel energy needs continue to increase (Paminto, 2020; Setyono & Kiono, 2021; Sugiyono, 2014). Until now, Indonesia is still very dependent on fossil fuel energy as an energy source, both in the industrial transportation sector (Avinda et al., 2021; Isyak, 2021; Pratama & Abidin, 2020). One of the energy fuels is petroleum. Petroleum is one of the important fuels for life (Fauzannissa et al., 2016). Petroleum is one of the natural resources that cannot be used, and its availability on this earth will be increasingly depleted. It causes problems because people's need for oil is increasing. To reduce dependence on petroleum, steps that can be taken are the development of environmentally friendly alternative materials. It is necessary to innovate alternative energy as a substitute for fossil fuels (Muhammad Faizal et al., 2018; Putra et al., 2013;

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Serevina et al., 2021). One of the innovations in the development of environmentally friendly alternative fuels is Biofuel. One of the ways to develop and utilize renewable energy is through the use of biofuels. Biofuel is a new renewable energy produced from raw materials from biological/organic materials (Andani et al., 2020; Tomo, 2015). Biofuel is one type of bioenergy that is considered the easiest to obtain and maintain by maintaining environmental quality (Gamayel, 2022; Soebiyakto & Effendy, 2020). Any liquid, solid, or gas produced from organic materials is called a biofuel. Some of the reasons why the use of biofuels is important, namely Reducing Emissions in various conditions; the level of domestic consumption of BBM is very large compared to the level of its production; The price of fuel on the world market has implications for the use of APBN funds for fuel subsidies. This type of energy cultivation is energy hunting, so its availability is limited (Maulana & Azis, 2016; Nugroho et al., 2021). In Indonesia, in supporting biodiesel, the government stipulates a mandatory biofuel in the Minister of Energy and Mineral Resources Regulation No. 32 of 2008 concerning the supply, utilization, and trading system of biofuels as other fuels. Knowledge is curiosity obtained after people sense certain objects (Dewi et al., 2017; Nisrima Siti, 2016; Vinet & Zhedanov, 2011). Knowledge is the result of remembering something, including recalling events that have been experienced either intentionally or unintentionally, and this occurs after people make contact or observations of a particular object, so that the basis for making decisions and determining behavior towards certain objects (Ali, 2020; Wahyuni et al., 2021). It is a memory of the materials studied (Chandra Kelana, 2017). It is concerned with the rebinding of broad materials from knowledge explained by theory, what is given using appropriate memory and information. Good knowledge is expected to foster the public perception of a problem.

Perception is collecting, recognizing, and dealing with sensory information to support understanding and explanation of the environment. Perception is one of the important psychological aspects for humans in responding to the presence of various aspects and symptoms around them (Ardalepa et al., 2022; Samrudi & Abd. Hadi Faishol, 2022; Setyawati & Sumeкто, 2022). Identifying community perceptions is very important to know the extent of the function, level of awareness, and impact of a sustainable development program. We can determine how someone selects, organizes, and monitors information and experiences through perception (Deriyanto et al., 2018; Rahadi & Stevanus, 2020; Sari & Adisel, 2022). Perception can also be divided into several types that must be known. Of course, there is a process that must be considered for perception. Using community perceptions, it is possible to characterize trends in the condition and use of natural resources and gain insight into experiences, efficiency, and sustainable management interventions (Astuti, 2018; Risal & Alexander, 2019; Sanudin, 2020). This research is in line with research conducted by Pulungan, which discusses knowledge of alternative energy sources. In this study, it is discussed that Alternative Energy for Street Lighting is very important to be known by the public (Pulungan et al., 2021). However, the research did not conduct several important interviews regarding public knowledge of alternative energy sources, so it could not be known clearly about public knowledge about alternative energy sources. This research is in line with research which discusses public perceptions about using alternative energy sources based on biofuels (Alam et al., 2021). However, the research did not perform comparisons and public perceptions. It looked at the effect of public knowledge and perceptions on the use of alternative energy sources.

The community's role will eagerly await the success of the planned biofuel development program. The role of the community is determined by common knowledge and public perception about the prospect of using alternative energy sources based on biofuels. There needs to be data regarding public knowledge and perception of the prospect of using biofuel-based alternative energy sources. 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. Moreover, to determine whether there is an influence on the public perception of the City of Jambi about the prospect of using alternative energy sources based on Biofuel.

2. METHODS

This study uses mixed research methods to determine the knowledge and perceptions of the people of Jambi City on alternative energy sources based on biofuels. This type of research is descriptive quantitative, and qualitative. The quantitative approach used in this study is to process data obtained from the research location (Amin et al., 2021; M Dwi Wiwik Ernawati et al., 2021; Kamid et al., 2021) and used as an instrument. The data collection instruments were in the form of questionnaires, in-depth interviews, and documentation. The sampling technique in this study was multistage random sampling. This technique was chosen because the object to be studied is very broad, namely the people in Jambi City. For research using statistical data, the minimum sample size is 30 (Amin et al., 2022; M Dwi Wiwik Ernawati et al., 2021; Kamid et al., 2022). The number of samples in this study was 100 respondents. In

this study, the population is the people in Jambi City, consisting of individual groups or clusters, with the characteristics presented in [Table 1](#).

Table 1. Demographic Characteristics of Research Respondents

Description	Characteristics
Gender	Male
	Female
Education	SMA
	S1
	S2
	S3
Work	Laborer
	Freelancer
	Housewife
	Private sector employee
	Trader
	Student
	Farmer
	Civil servants
	Police/TNI
	Self-employed

The questionnaire that will be used is tested for validity and reliability. Before being analyzed, it was processed and tabulated systematically using Microsoft Excel and SPSS. [Table 2](#) is a questionnaire instrument for people's knowledge and perceptions.

Table 2. Interval of Public Knowledge and Public Perception About the Prospect of Using Alternative Energy Sources Based on Biofuel

Category	Interval variabel/Indikator	
	Community Knowledge	Community Perception
Very not good	6.0-10.8	6.0-10.8
Not good	10.9-15.6	10.9-15.6
Enough	15.7-20.4	15.7-20.4
Good	20.5-25.2	20.5-25.2
Very good	25.3-30.0	25.3-30.0

Data analysis in this study is divided into two, namely descriptive statistical testing and inferential testing in the form of testing assumptions and hypotheses. These data included descriptive statistical and inferential tests to test assumptions and hypotheses (simple regression). [Figure 1](#) is the research procedure.



Figure 1. Research Procedure

Based on [Figure 1](#), it can be seen that this research started with quantitative data collection. After quantitative data was obtained, qualitative data was collected to strengthen the qualitative data. After that, data analysis was carried out using descriptive and inferential statistics using simple regression to get a conclusion in this study.

3. RESULT AND DISCUSSION

Results

Table 3. Description of Community Knowledge and Public Perception

Variabel	Category	Interval	F	%	Mean	Med	Min	Max
Community Knowledge	Very not good	6.0-10.8	7	7	3.6	4.5	1.0	5.0
	Not good	10.9-15.6	5	5				
	Enough	15.7-20.4	13	13				
	Good	20.5-25.2	15	15				
	Very good	25.3-30.0	60	60				
Public perception	Very not good	6.0-10.8	10	10	3.4	4.3	1.0	5.0
	Not good	10.9-15.6	9	9				
	Enough	15.7-20.4	12	12				
	Good	20.5-25.2	14	14				
	Very good	25.3-30.0	55	55				

From the description of [Table 3](#), it can be seen that the comparison with the very good category on the community knowledge variable is higher than the public's perception of the prospect of using biofuel-based alternative energy sources, so it can be said that the community's knowledge of alternative energy resources based on biofuels is superior to the public's perception of prospects for the use of biofuels alternative energy sources based on biofuels. The linearity test of public knowledge and public perception of the prospect of using alternative energy sources based on biofuels is described in [Table 4](#).

Table 4. Linearity Test of Public Knowledge and Public Perception

Variable	Kolmogorov-Smirnov Sig	Deviation from linearity Sig
Community Knowledge	0.035	0.028
Public perception	0.032	0.026

Based on [Table 4](#), it can be said that the linearity test of the variables above has a linear relationship between public knowledge and public perception about the prospect of using alternative energy sources based on biofuels. It is proven that the result of the sig is less than 0.05. Regression test of public knowledge and public perception about the prospect of using alternative energy sources based on Biofuel is described in [Table 5](#).

Table 5. Regression Test of Public Knowledge and Public Perception

Variable	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.
	B	Std. Error			
Community Knowledge	63.457	3.557		12.472	0.022
Community Knowledge	0.055	0.032	0.032	0.304	0.024
Community Knowledge	83.452	6.344		13.200	0.023
Community Knowledge	0.083	0.055	0.045	0.302	0.033

Based on [Table 5](#), it can be said that there is an influence between public knowledge and public perception about the prospect of using alternative energy sources based on biofuels. It is proven from the results of sig. Smaller than 0.05. The results of interviews with the people of Jambi City, the first question is, Do you know about alternative energy sources? Furthermore, the answers from the community, on average, answered knowing about alternative energy sources. Then the second question. Do you know about alternative energy sources based on biofuels? Furthermore, the answer is that the average community knows about alternative energy sources based on biofuels. Then the third question is, Do you think Biofuel is good as an alternative energy for household needs? Moreover, the answer from the community is that it is very useful for household needs because biofuels come from plants and animals. Lastly, do you think biofuels are good as alternative energy for household needs? Moreover, the community's answer is very useful if its use is appropriate.

Discussion

This study's data analysis is divided into descriptive statistical testing and inferential tests in the form of testing assumptions and hypotheses. Descriptive test to determine the data through the mean, median, minimum, and maximum (Amin et al., 2021; Kamid et al., 2021). From these data, descriptive statistical and inferential tests were carried out to test assumptions and hypotheses. The first is to look at the description of community knowledge and public perceptions about the prospect of using alternative energy sources based on biofuels. Based on the results of the descriptive test, it can be seen that the comparison with the very good category on the community knowledge variable is higher than the public's perception of the prospect of using biofuel-based alternative energy sources. It can be said that public knowledge of biofuel-based alternative energy resources is superior to public perceptions of the prospect of using biofuel sources alternative energy based on biofuels. After conducting a descriptive test, the researcher conducted an assumption test. The assumption test used was the linearity test. The linearity test determines whether the data is linear (Budiarti et al., 2022; M Dwi Wiwik Ernawati et al., 2021; Kamid et al., 2022). The results of the linearity test of public knowledge and public perceptions about the prospect of using resources alternative energy based on Biofuel the linearity test of the variables above certainly has a linear relationship between public knowledge and public perception about the prospect of using alternative energy sources based on Biofuel. It is proven that the sig result is less than 0.05. It was found that the results of the data on the assumption test of the variables above had a linear relationship. Next is the Hypothesis Testing. The hypothesis test used is Regression Test. The regression test determines two or more variables to be tested (Amin et al., 2021; Budiarti et al., 2022). In the Regression Test of public knowledge and public perception about the prospect of using alternative energy sources based on Biofuel, the results showed an influence between public knowledge and public perception about the prospects for using alternative energy sources based on Biofuel. It is proven from the results of sig. smaller than 0.05 (Amin et al., 2021; Syaiful et al., 2021). It shows a relationship because the requirements of the regression test are still less than 0.05 (Margaret Dwi Wiwik Ernawati et al., 2022; Kamid et al., 2022; Rohana et al., 2021).

Based on interviews with the people of Jambi City, the first question is, Do you know about alternative energy sources? Moreover, the answers from the community, on average, answered knowing about alternative energy sources. Then the second question. Do you know about alternative energy sources based on biofuels? Moreover, the answer is that the average community knows about alternative energy sources based on biofuels. Then the third question is, Do you think Biofuel is good as an alternative energy for household needs? Furthermore, the answer from the community is that it is very useful for household needs because biofuels come from plants and animals. Lastly, do you think biofuels are good as alternative energy for household needs? Moreover, the community's answer is very useful if its use is appropriate. Based on these results, it can be concluded that there is an influence between public knowledge and public perception about the prospect of using alternative energy sources based on biofuels. It is proven by their knowledge of alternative energy sources based on biofuels. These people generally already know about alternative energy sources. Then from the variable perspective of the people who know the functions and benefits of alternative energy sources based on biofuels. As evidenced by the community's answer, the community answered that it was very useful for household needs, and biofuels derived from plants and animals are easily available.

This research is in line with research which discusses knowledge of alternative energy sources (Pulungan et al., 2021). In this study, it is discussed that Alternative Energy for Street Lighting is very important to be known by the public. However, the research did not conduct several important interviews regarding public knowledge of alternative energy sources, so it could not be known clearly about public knowledge about alternative energy sources. This research also line with previous study which discusses public perceptions about using alternative energy sources based on biofuels (Alam et al., 2021). However, the research did not perform comparisons and public perceptions. It looked at the effect of public knowledge and perceptions on the use of alternative energy sources. In the line, the novelty in research is that the community's role will eagerly await the success of the planned biofuel development program. The role of the community is determined by 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 of the prospect of using biofuel-based alternative energy sources. The implications of this research are expected to be useful for readers because the success of the planned biofuel development program will depend on the role of the community. The role of the community is determined by common knowledge and public perception about the prospect of using alternative energy sources based on biofuels.

4. CONCLUSION

Based on the discussion of qualitative and quantitative data, it was found that knowledge and perceptions of the people of Jambi about the prospect of using biofuel-based alternative energy sources showed alternative benefits between knowledge and the Jambi City community's perception of the prospect of using biofuel-based energy sources. It shows that the higher the public's knowledge, the better their perception of using alternative energy sources based on biofuels so that the community can take a role and support the prospect of using alternative energy sources based on biofuels. The implications of this research are expected to be useful for readers because the success of the planned biofuel development program will depend on the role of the community. The role of the community is determined by common knowledge and public perception about the prospect of using alternative energy sources based on biofuels.

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