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Existing Model of Used Cooking Oil-Based Biodiesel Management in East Java

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Abstract

This research aims to find out the management model of biodiesel based on used cooking oil in East Java. In this study, researchers used a research method with a qualitative approach. The result of this research is that the management of biodiesel based on used cooking oil in East Java technically, no special field handles these problems, so the relationship between related agencies could have gone better. In the research findings in the field, the current model still needs to improve. The use of interpretive qualitative methods was to provide satisfactory information related to the required aspects of the research and for researchers to closely assess the respondents' views on the challenges of recycling used cooking oil to produce biodiesel. The management of used cooking oil-based biodiesel in East Java technically does not have a special field that handles this problem, so relations between related agencies do not run well. In the policy-making process, there has also yet to be an adjustment to the existing characteristics of society, resulting in the policy for managing used cooking oil-based biodiesel not being optimal.

Keywords: existing model, biodiesel, management

INTRODUCTION

A global energy crisis has hit the world in the past few years. This is exacerbated by the COVID-19 pandemic that has hit the world in the last 4 years [1]. In September 2021, the price of Brent oil touched above US$80 per barrel for the first time since three years earlier. This increase has resulted in inflationary pressures on the global economy. This was exacerbated by the war between Ukraine and Russia in early 2022 [2].

To overcome this crisis, the only way is to make the transition to renewable energy, only then can the world survive the energy crisis [3]. The problem faced by the world today if the transition to new renewable energy is done directly is the low industrial power in buying new renewable energy, which is expensive [4].

Countries in the world today have started to reduce the use of fossil fuels. They reduce the use of diesel because diesel is an energy source that is not environmentally friendly and non-renewable [5]. The use of diesel causes air pollution because it produces high CO^2 gas emissions. Diesel also produces high emissions of CO, SO^2, and particulates. These greenhouse gas emissions can cause global warming and global climate change [6].

To minimize the impact of using diesel, it is necessary to use renewable energy. There are various forms of renewable energy, including solar energy sourced from the sun, water energy, wind energy, geothermal energy, and biodiesel [7]. All of these energies have their own advantages and disadvantages, such as solar energy [8]. The energy will not run out to be used but has the disadvantage that the cost and other energy are expensive renewable energy mentioned above also comes from nature, so their use can be used for free [9].

Among the various types of energy, biodiesel energy has an advantage that is not possessed by other types of energy, namely the ability of this energy to process various wastes, one of which is used in cooking oil [10]. Thus, biodiesel has the advantage of not only optimizing the use of clean energy, but also becoming a medium for environmental control. This is something that is not possessed by other energy, so in this study biodiesel energy was chosen as an instrument in energy security [11].

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MATERIAL AND METHOD

In this research on "Existing Model of Used Cooking Oil-Based Biodiesel Management in East Java" using a qualitative research approach. In a qualitative approach, the methods used in general are (1) questionnaire method, (2) observation method, (3) interview. According to qualitative experts, the more data collection methods and the more consistently they are used or applied, the easier it is for researchers to analyze.

Data Collection

While collecting data in this study, researchers placed humans as the most important figures and positioned them as the main instruments in this study. There are two data collection methods: interactive and non-interactive. Interviews, direct observation, and the participation of researchers directly in the field are interactive techniques. In contrast, in studying archives and analyzing documents, researchers who do not play an active role or do not make direct observations in the field use non-interactive techniques.

RESULT AND DISCUSSION

In the research findings in the field, the existing model used today still has many shortcomings. Even though the legal rules related to biodiesel energy management have been regulated and targeted based on Regional Regulation Number 6 of 2019 concerning the Regional Energy General Plan for East Java Province in 2019-2050 [12].

East Java also faces several business challenges related to used cooking oil being processed into biodiesel, such as the large number of collectors that make the price of used cooking oil expensive for companies [13]. These collectors then cut the income of entrepreneurs because they increase production costs. Of course, with collectors like this, the community does not get the maximum profit.

Then the business orientation is still export-oriented abroad. Currently, there are no regulations related to regional regulations on the control of used cooking oil, in addition, there is no mandatory policy on used cooking oil-based biodiesel standards, and there is no ease of doing business [14]. The basic cause of the problem of exporting used cooking oil out of the country is the legal vacuum that exists in Indonesia related to the standardization of used cooking oil-based biodiesel [15]. Therefore, this has led to the non-implementation of the energy security policy for used cooking oil-based biodiesel in East Java.

In East Java at this time there is also no effort to optimize the management of used cooking oil-based biodiesel, it can be seen that news related to renewable energy is minimal, especially used cooking oil-based biodiesel, then there is no sense of concern from various parties about the impact of used cooking oil on the environment and health [16].

The management of biodiesel based on used cooking oil in East Java technically has no special field that handles these issues, then the relationship between related agencies does not work well (Darmawan & Susila, 2013). In the policy-making process, there is also no adjustment to the existing character in the community, which causes the management of used cooking oil-based biodiesel policy to not be optimal [17].

Several important elements in realizing Collaborative Governance include leadership, dependence on one another, clear incentives, the policy-making process, the resources owned and the development program collaboration system, and finally the resulting impact.

This collaboration process specifically, collaborative governance has placed a lot of emphasis on voluntary collaboration and horizontal relationships between multisector participants, because demands from clients often exceed the capacity and role of a single public organization, and require interaction between various organizations related to and involved in public activities. Collaboration is needed to enable governance to be structured so that it effectively meets the increasing demands arising from management across government, organizational and sectoral boundaries.

According to Bingham, "Collaborative means to co-labor to achieve common goals working across boundaries in multisector and multifactor relationships". Bingham describes the meaning of collaboration which involves several actors helping each other to achieve certain goals. These actors work not only in one sector but in several sectors.

In this collaborative process the parties are identified, namely first the main parties (primary stakeholders), namely the parties who are directly affected, both positive and negative, by a program or project and have a direct interest in the activity, then the supporting parties (secondary stakeholders) namely the parties who

have no interest in the activity have concerns, thirdly, namely the key stakeholders, namely the parties who have legal authority in terms of decision making.

The community in this activity is of course the main parties in the policy, then the supporting parties are companies and the media, while the key parties are the agencies related to the management of used cooking oil-based biodiesel and the agencies related to the control of used cooking oil.

Stakeholder analysis models are used to understand stakeholders by looking at their position, influence, and interests. Apart from that, it can also provide an overview of the stakeholders involved. This modeling framework is used to determine stakeholders in the power vs interest classification proposed by Ackerman & Eden (Ackermann & Eden, 2011). Ackermann and Eden categorize stakeholders based on power vs interest. This mapping is to determine stakeholder classification based on the relationship between power and interests held by the stakeholder concerned (Ackermann & Eden, 2011).

By knowing the classification of stakeholders, it will be easier to map their respective roles in the context of collaboration. Collaboration is a concept related to sources of efficiency and quality in serving. This collaboration between parties also shows the nature of a partnership between one another.

In Indonesia today, of course, there is a need to change the paradigm of government governance, which was originally oriented towards working alone to working together in cooperation to achieve common goals, which can also be called network government or collaborative governance. Collaborative governance paradigm, the government, in this case central and regional agencies, cannot work to solve public problems alone

The parties who collaborate in the policy implementation model for managing used cooking oil-based biodiesel in East Java, if analyzed in broad terms, have three parts, namely the party responsible for legal and policy matters, in this case the department, then the party responsible for conducting socialization, namely the Regional Military Command, Kodim, and the community, and the party that produces biodiesel, namely the company. All of them are mutually sustainable and synergistic in managing used cooking oil-based biodiesel.

This Collaborative Governance model can be a model that is implemented as an effort to realize good governance with the involvement of all stakeholders. The research also found that it is necessary to strengthen the position of society in Ansell and Gash's collaborative governance theory. This is because in Ansell and Gash's theory, the community still has a limited position, namely limited to participants who can provide input and suggestions in the collaborative process. Even though in Ansell and Gash's theory, there are facilitative leadership variables that should be upheld by the community, in reality, in the collaborative process in Ansell and Gash's theory, the community is still only considered the party providing input and suggestions.

Interesting Facts and Findings in the Management of Used Cooking Oil-Based Biodiesel in East Java

When viewed from a regulatory aspect, the regulation of energy security policies in Indonesia is in the hands of the central government and regional governments. Philosophically, this is because national energy security will be greatly influenced by regional energy independence. The role of provincial governments in realizing national energy security is embodied in the RUED of each region to realize regional energy independence.

Both RUEN and RUED must be considered mutually continuous with each other. Implementing the two will also influence the achievement of targets in the national energy framework. RUEN is the central government's authority regarding national-level energy management plans, which are the elaboration and implementation plans of KEN, which are cross-sectoral to achieve KEN targets. Meanwhile, RUED is a provincial government policy regarding regional-level energy management plans, which is an elaboration and implementation plan for RUEN, which is cross-sectoral to achieve RUEN targets.

The primary authority for making RUED is as contained in Article 18 of Law Number 30 of 2007 concerning energy, which states that:

(1) The regional government prepares a general regional energy plan by referring to the national available energy plan as intended in Article 17 paragraph (1).

(2) The general regional energy plan, as intended in paragraph (1), is determined by provincial regulations.

In forming the RUED, the community, individually and in groups, can play a role in preparing the general national and regional energy plans and energy development for the public interest.

RUED and its implementation are very influential in achieving national energy security because regional governments should implement national energy conservation as contained in Article 25 of Law Number 30 of 2007 concerning energy. Energy conservation is a systematic, planned, and integrated effort to conserve domestic energy resources and increase the efficiency of their utilization.

In implementing national energy conservation, energy users and producers of energy-efficient equipment who implement energy conservation are given facilities and incentives by the government and regional governments. On the other hand, energy resource users and those who do not implement energy conservation are given disincentives by the government and regional governments.

The implementation of RUED as an integrated part of the implementation of RUEN must be by the authority given by the central government to regional governments. Within the provincial scope, the provincial government has several references related to renewable energy, including:

a. Issuance of permits for direct use of geothermal energy across districts/cities within 1 (one) provincial region.
b. Issuance of a registration certificate of supporting service businesses whose business activities are in 1 (one) provincial region.
c. Issuance of permits, guidance, and supervision of trading businesses in biofuels as other fuels with a supply capacity of up to 10,000 (ten thousand) tonnes per year.

In developing biodiesel renewable energy, several things can be done by the regional government of East Java Province, namely developing biomass-based electricity made from agricultural, plantation, and municipal waste, then developing biogas-based electricity made from liquid palm oil factory waste and other industrial waste. (tapioca, tofu, etc.), As well as developing seaweed-based electricity, you can use used cooking oil, which has great potential, as mentioned in the introduction at the beginning.

However, no regulations currently support the optimal use of biodiesel, especially used cooking oil-based products. Currently, the government is still using biodiesel, which is still mixed with diesel or B30, as stated in the Minister of Energy and Mineral Resources Regulation Number 12 of 2015 concerning the Third Amendment to the Regulation of the Minister of Energy and Mineral Resources Number 32 of 2008 concerning Provision, Utilization and Trading Administration Vegetable Fuels (Biofuels) as Other Fuels.

The emptiness of this regulation is also emphasized by the absence of specific rules regarding the standards for cooking oil-based biodiesel that are currently used. This is certainly different from palm oil-based biodiesel, which since 2008 has been implemented with a biodiesel mixture content of 2.5%. Gradually, biodiesel levels increased to 7.5% in 2010.

On September 1, 2013, the mandatory use of biodiesel was increased to 10% (B10). With this policy, the realization of mandatory implementation of biodiesel in 2014 reached 1.84 million kilo liters (kl), or an increase of 75% compared to the mandatory biodiesel achievement in 2013. The use of biodiesel mixed into specific types of fuel oil (JBT) is a contributor. The main factor in increasing these achievements was 1.16 million KL (or equivalent to 62.7% of the total achievements in 2014).

In 2015, the Government issued six policy packages to respond to the weakening value of the rupiah against the dollar, one of which was an increase in the mandatory 15% Biodiesel blending (B15). The B15 utilization policy needs to be implemented immediately to support macroeconomic policies and save the country's foreign exchange by reducing fuel imports. Mandatory implementation of B15 will be able to absorb domestic biodiesel production of 5.3 million KL (equivalent to 4.8 million tonnes of Crude Palm Oil (CPO)) and provide foreign exchange savings of 2.54 billion USD.

Then, since January 1, 2016, the biodiesel policy with the obligation to mix biodiesel has increased by 20%. Based on Minister of Energy and Mineral Resources Regulation No. 12 of 2015 concerning the Third Amendment to Minister of Energy and Mineral Resources Regulation no. 32 of 2008 concerning the Provision, Utilization and Trading Administration of Vegetable Fuels (Biofuels) as Other Fuels.

When implemented, the Government provided incentives with funding support from

the Palm Oil Plantation Fund Management Agency (BPDPKS) to cover the difference between the Biodiesel Market Index Price and the Diesel Market Index Price for the public service obligation (PSO) sector and starting September 1 2018 the provision of incentives was expanded to the non-PSO sector.

The 20% Biodiesel (B20) program is running well with the support of sufficient production capacity, performance tests/road tests, and regular monitoring of quality and quantity by an independent team, as well as the preparation of Indonesian National Standards (SNI). There are 25 BU BBN active in production with a total installed capacity of 12.06 million KL/year.

Domestic use of 3.75 million KL of biodiesel in 2018 has reduced diesel imports by 466,902 KL and saved foreign exchange of USD 1.89 billion or IDR 26.27 trillion. Biodiesel in 2018 has also succeeded in reducing GHG emissions and improving environmental quality by 5.61 million tons of CO2.

Then, in 2020, the mandatory increase was 30% (B30). The growth in biodiesel blending with diesel fuel was carried out due to the successful implementation of the B20 Program and in line with the biodiesel blending targets set out in the Minister of Energy and Mineral Resources Regulation Number 12 of 2015. Implementing B30 is also expected to reduce fuel import rates further, thereby increasing the country's foreign exchange.

These standards show that in its development, the government still needs to implement a standards program for used cooking oil-based biodiesel, indicating that there has been no special attention to used cooking oil-based biodiesel.

Another interesting finding is that based on the targets contained in the East Java RUED-P, in 2025, East Java Province has a target of building a Biodiesel industry whose production target is 1278 thousand kiloliters. However, until now, there has yet to be the slightest continuity regarding this matter. Based on the findings, this is due to the need for companies that desire to produce biodiesel.

This aspect is an addition to George Edward III's theory of policy implementation because, in this theory, there is no aspect of environmental or community characteristics in accepting policies. This is an aspect that determines policy implementation.

Based on the research results above, the initial conditions have been revealed regarding the characteristics of the community in this policy. Currently, society has the feature of tending to be open but with minimal knowledge. This minimal knowledge will become an obstacle in implementing policies and the policy integration model proposed in this research.

However, with open characteristics, it becomes an opportunity to implement policies to overcome obstacles in a lack of knowledge by providing education through outreach. These environmental variables are necessary for the problem of barriers related to the characteristics of the community/environment receiving the policy to be known.

The successful implementation of community waste cooking oil-based biodiesel management is very dependent on the role of the government and the community. Both must be able to create synergy. The government can achieve optimal management results by involving the community in cooking oil-based biodiesel.

Apart from requiring community involvement, managing used cooking oil-based biodiesel also requires the right strategy to be more efficient in financing and effective in terms of results. Choosing a management strategy for using cooking oil-based biodiesel is important because it will determine the government's and the community's roles so that both parties can play an optimal and synergistic role.

The involvement of the wider community is one of the most important keys in the successful management of used cooking oil-based biodiesel. With community involvement in managing used cooking oil-based biodiesel, the government will no longer implement a top-down management system. Still, it will implement a bottom-up system where suggestions from the community will become important input in efforts to manage used cooking oil-based biodiesel.

With these environmental variables, policy implementers can adapt policies to the characteristics of society. Likewise, in making policy integration models, with these environmental variables, the model making can be adapted to actual conditions and needs improvement.

The following theoretical criticism is related to Ansell and Gash, namely, making society the subject and including aspects of supervision. In the collaboration process, the community should be essential in strengthening the process. However, the community is only a complementary aspect during the collaboration process. This situation can harm society because

it only becomes pseudo-participative in policy formation. This is reinforced by Arnstein's theory of the ladder of participation, which states that participation has several levels of qualifications: manipulation, therapy, informing, consultation, reassurance, cooperation, delegation of power, and citizen control.

Environmental variables are the most crucial aspect of policy implementation. Policymakers must know the characteristics of policy recipients because if they need to understand them, it can result in effective policy implementation.

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The level of artificial involvement of society in a collaborative process in Arnstein's theory is called the level of manipulation. In this theory, Arnstein states that the cause of manipulation is due to the goals of certain parties for their interests. Because of this manipulation, certain parties are harmed. The disadvantaged people are usually the lower classes of society; in this case, the organization does not participate much (pseudo). Even people need to learn what the purpose is. Manipulation also causes people's welfare to be low.

At this level of manipulation, the community only becomes a listening object and cannot provide much of a voice at the level of the collaboration process. Their views and opinions are very limited by policymakers because they are considered not to have an important and useful position in the collaboration process. Therefore, it is very important to understand that in this process, the community is not only artificial but also has the same responsibilities and rights in the collaboration process.

Involving the community optimally in the collaboration process will undoubtedly strengthen the outcomes and quality of the policies produced. Through the deliberation model, the community will be heard more and not only used as a formal legal aspect in policy formation. This manipulation activity tends to be used only to gain public support and is limited to making promises to improve things, even though this has never been done.

So that the objectives of supervision can be achieved, the following things can be done:

(1) Evaluate success in achieving business goals and targets following predetermined

indicators. This is important so that we can learn what determines a target achievement in the future. For example, last year we increased the number of customers significantly so that the company's profits increased. We must evaluate this success so it can be duplicated in other business areas.

(2) Take steps to clarify and correct any deviations that may be found. This is important to ensure transparency regarding the incidents found. For example, the previous model detected fictitious customers by increasing the number of customers. These customers are recruited by third parties in several work areas. So, this needs to be clarified and resolved so that disturbing rumors do not arise.

(3) Carry out various alternative solutions to problems related to achieving business goals and targets. It is important to provide alternatives when the planned leading resolution does not meet expectations. For example, in the continuation of the story above, Using third parties is only effective in big cities. Meanwhile, in remote areas, it could be more effective. So, it is necessary to look for alternative solutions to problems that arise so that the targets to be achieved in remote areas can be performed according to plan.

To differentiate between the before and after theoretical frameworks, the before and after models are presented as follows:

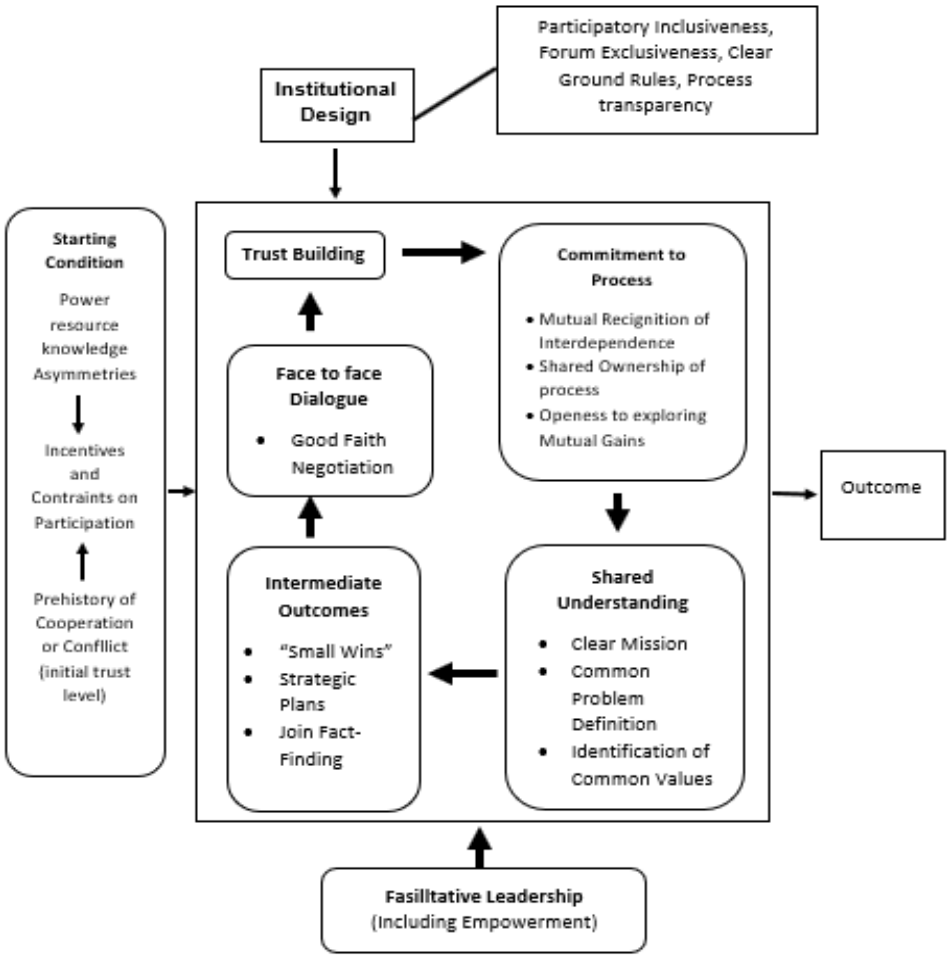

Figure: Ansell and Gash's collaboration theory
Source: Ansell and Gash (2008)

In line with this, in this research, the community's position through criticism of Ansell and Gash's collaborative governance theory will be increasingly optimized through deliberation and direct involvement of the community in the policy-making process. To strengthen this, it is also necessary to add internal monitoring variables to strengthen guarantees of community involvement in the collaboration process.

This supervision avoids the existence of a conspiracy process carried out by government elements to plan an evil conspiracy. In the end, it will harm the aspects of the collaboration process. This supervision can be an important variable in monitoring the progress of the collaboration process. In the Ansell and Gash collaboration process, this needs to be accommodated, resulting in no supervision during the collaboration process.

Discovery of a Model for Implementing Energy Security Policies in the Context of Increasing Biodiesel Renewable Energy Based on Used Cooking Oil in East Java

This research finds a model for implementing energy security policies to increase renewable energy from used cooking oil-based biodiesel in East Java. This model can be a theoretical basis for implementing energy security policies in achieving the East Java RUED-P target in 2025. As a speculative basis, this model is an ideal form for implementing energy security policies in East Java.

This model will accommodate various sectors managing used cooking oil-based biodiesel energy, from the community to the policy level. This way, the used cooking oil-based biodiesel energy management process can be well integrated. Through good management of biodiesel energy through this model, the renewable energy target will also be achieved by 2025.

This model will concretely create policies in the form of regional regulations regarding the control of used cooking oil waste and encourage the formation of mandatory policies for biodiesel standards based on used cooking oil. Encouraging these various concrete policies can create a good legal climate to base business in the used cooking oil-based biodiesel energy sector.

This model will also achieve the resilience of East Java's renewable energy security. This tough energy security will impact the national level, achieving the RUEN target. Indirectly, energy security is not only achieved at the regional level but also the national level.

This research also produces an integrated model for implementing used cooking oil-based biodiesel energy security policies in East Java as an appropriate model for managing used cooking oil-based biodiesel in East Java. Through this model, the management of used cooking oil-based biodiesel will be carried out integratively through all elements involved in the collaborative process.

With this model, energy security in East Java Province through used cooking oil biodiesel will be more optimal, bearing in mind that currently, the process of achieving the biodiesel target has not been implemented due to the constraint of the absence of companies that want to produce used cooking oil-based biodiesel. With the integration process of all elements, including entrepreneurs, massive biodiesel production can be encouraged in East Java.

CONCLUSION

In the research findings in the field, the existing model used today still has many shortcomings. Even though the legal rules related to biodiesel energy management have been regulated and targeted based on Regional Regulation Number 6 of 2019 concerning the Regional Energy General Plan for East Java Province in 2019-2050.

The management of biodiesel based on used cooking oil in East Java technically there is no special field that handles these issues, then the relationship between related agencies does not go well. In the policy-making process, there is also no adjustment to the existing character in the community, which causes the policy on the management of used cooking oil-based biodiesel to not be optimal.

Theoretically, based on findings in the field, this research also constructs a theoretical reconstruction of George Edward III's policy implementation theory and Asell and Gash's Collaborative Governance Theory. Theoretical reconstruction of George Edward III's policy implementation theory is by adding policy environment variables. Meanwhile, in the reconstruction of Asell and Gash's Collaborative Governance Theory, namely by adding supervision variables.

By applying the model findings in this research, collaboration between actors and the theoretical reconstruction can answer problems

related to increasing the resilience of biodiesel-based renewable energy in East Java.

Suggestion

1. To the Penta helix actors to immediately implement the Integration Model for implementing the Used Cooking Oil-Based Biodiesel Energy Security Policy in East Java. By implementing the Integration Model for implementing the Used Cooking Oil-Based Biodiesel Energy Security Policy together, energy security in East Java can increase, used cooking oil waste can be used as a renewable energy source, and the environment can be protected from pollution due to used cooking oil waste. This is important to do as soon as possible because it can provide significant benefits for East Java in the long term, and the negative impacts resulting from using cooking oil waste will not be more effective.
2. To the Department of Energy and Mineral Resources of East Java Province, based on the results of the collaboration process in terms of institutional design, which by deliberation was deemed the most relevant for leading collaboration (facilitative leadership), it is recommended that they do the following:
    a. Strengthen coordination by holding regular coordination meetings and strengthening cooperation networks between actors involved in collaboration. This is important to do so that the collaboration process runs optimally in terms of increasing trust, increasing commitment, and increasing understanding between actors, as well as being able to monitor the progress that has been achieved.
    b. Providing advice to the Ministry of Energy and Mineral Resources to create a Mandatory Policy on Biodiesel Based on Used Cooking Oil. This is important because the standards used still use palm-based biodiesel standards. This standard is difficult for producers of used cooking oil-based biodiesel to fulfill, especially in achieving the haze point. If the standard still uses palm-based biodiesel, it will make it difficult for biodiesel entrepreneurs to produce used cooking oil-based biodiesel so that used cooking oil waste cannot be optimized into renewable energy.
    c. Increasing public understanding regarding using used cooking oil-based biodiesel renewable energy and its environmental benefits by conducting education and outreach programs. This is important because public knowledge of used cooking oil-based biodiesel still needs to be improved and can lead to a lack of support from the community, making it difficult to achieve the set targets.

The East Java Province Environmental Service, as the leading sector in the role of handling used cooking oil waste, is advised to do the following:

a. Establishing East Java Regional Regulations regarding Control of Used Cooking Oil Waste. This is important because, currently, there is no specific regional regulation relating to used cooking oil waste, so the handling of used cooking oil waste still needs to be improved.
b. Coordinate with other actors such as environmental NGOs, babinsa, and the media to optimize the collection of used cooking oil waste. This is important because there needs to be special cooperation between actors in handling used cooking oil waste.
c. Increase understanding of the community by conducting outreach and education. This is important because public knowledge of the dangers of used cooking oil waste is still low, so a lot of used cooking oil waste is still thrown into environmental media and is not optimal for collection as biodiesel raw material.

For future research, to be more comprehensive and increase the benefits of managing used cooking oil-based biodiesel, the following are recommended:

a. Increasing the scope of research at the national level. This is important to encourage the immediate issuance of a mandatory policy on biodiesel based on used cooking oil.
b. In using George Edward III's policy implementation theory, add the Policy Environment variable, and in the collaborative governance theory, add the variables of supervision and community participation.
c. Using a mixed method research method to obtain more comprehensive results.

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