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OPTIMIZING THE ROLE OF KPM STUDENTS IN DEVELOPING CIAWIGAJAH VILLAGE THROUGH DIGITAL TRANSFORMATION WITH WEB PLATFORM

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Abstract. Two critical innovations that support environmental sustainability and community empowerment are waste processing into alternative fuels and village digitalization through the Internet. Both innovations offer solutions to the problem of waste accumulation while reducing our dependence on fossil fuels. This technology converts organic and inorganic waste into usable energy, such as biogas or RDF. This method can produce cleaner energy sources and reduce greenhouse gas emissions. On the contrary, village digitization through web platforms is a strategic step in increasing access to information, services, and economic opportunities for rural communities. By using this platform, villages can develop local potential, improve the efficiency of public services, and encourage broader digital inclusion. This platform can meet many needs, including village administration management, promotion of local products, and further training and education. The combination of these two innovations demonstrates collaborative efforts to realize sustainable development that combines environmentally friendly technology solutions and digital community empowerment. The results are hoped to improve the quality of life, reduce unpleasant environmental effects, and accelerate economic transformation in rural areas.

Keywords*:* waste processing, alternative fuels, village digitalization, web platform

INTRODUCTION

Many developing countries, including Indonesia, need two problems: waste management and village digitization efforts. Waste, especially those derived from plastics and organics, has posed a significant environmental threat. In contrast, limited access to digital technologies in rural areas hampered the economic and social progress of local communities.

Waste treatment for alternative fuels is a creative solution that reduces the amount of waste and provides a more environmentally friendly renewable energy source. With this method, hard-to-decompose waste can be converted into fuels such as biodiesel or biogas, which can be used daily. This step reduces the environmental burden and has great economic potential for local communities, especially in rural areas.

In the digital era, access to information and communication technology is very important for a country's progress. Creating websites and other digital platforms is one way to bridge the digital divide between cities and villages. Digitalization can facilitate rural communities' access to education, health services, and economic opportunities. In addition, digitalization can help manage local resources, market village products, and increase community participation in village development.

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Two creative methods, processing waste into alternative fuels and digitizing villages through the internet, can potentially increase sustainable development. The problem of garbage has developed into a global problem in the modern era, which requires innovative solutions. Waste can be turned into an environmentally friendly alternative energy source. Waste-to-energy (WTE) techniques produce energy that can be used for various purposes while significantly reducing the volume of waste. Village digitalization provides a great opportunity for rural communities to connect with the outside world and gain easier access to information, education, health services, and economic opportunities. Villages can also leverage digital technology to develop local potential, promote superior products, and improve their quality of life. Digitalization also allows for more transparent, effective, and engaged village government.

Table 1. Potential of Village Excellence

No.	Business Unit	Superior Potential
1.	Ciawiwater mineral water	Mineral water products and their packaging
2.	Independent waste management	Plastic waste shredding and waste management household waste
3.	Agrotourism	D'Sarongge Park and Campground Plan
4.	Agriculture	Purple yam, rice, and fruit crops
5.	Farm	Sale of livestock in the form of buffalo and cattle meat, sheep and goats

Table 1 provides data on some of the superior potentials in Ciawigajah village. The following will explain the profile of the village's business units.

Ciawigajah Village, located in Beber District, Cirebon Regency, West Java, can develop economically and become an example for other villages to generate original village income. The potential of Ciawigajah Village consists of six businesses that are managed independently. These businesses allow Ciawigajah Village to create funds of IDR 147,000,000 per year. There are six business units in village-owned enterprises (BUMDes), including:

a. Ciawiwater mineral water:

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The treatment of mineral water in Ciawigajah Village is one of the village's famous and interesting people's businesses. This mineral water treatmentmineral water comes from the Hambulu spring water source. This water is very natural and rich in minerals and vitamins.

b. Independent waste management

Waste in Ciawigajah Village is currently processed with waste shredding machines available in several locations. To ensure the program's sustainability, waste workers take garbage from residents' homes twice a week.

c. Agro-tourism:

The village creates an agro-tourism business for sustainable economic growth. This agro-tourism program is designed with various designs, such as creating an educational park (Argowisata) in D'Sarongge Park.

d. Agriculture:

Agriculture in Ciawigajah Village can be the residents' main income source. Crops such as purple yams, rice, and fruits can be sold or exported to increase farmers' income.

e. Farm:

Livestock such as buffalo, beef cattle, sheep, and goats can be the main source of income for the people of Ciawigajah Village. The sale of these farm animals can generate great profits, especially if they are adequately managed. With income from livestock, the welfare of the people of Ciawigajah Village can increase. Improving living standards, such as household infrastructure, education, and health, can be achieved by growing incomes.

One of the efforts of the Ciawigajah Village government to improve the village economy is through training of business units such as PKK women's training, Karang Taruna training, mosque youth training, and so on. The Ciawigajah Village Government hopes to improve the skills and quality of human resources with this training. In addition to the training, the village government also provides facilities and infrastructure to support all economic activities of Ciawigajah Village. Vocational villages combine various types of training and vocational practices to develop existing business units in the town based on their benefits. (Ayuningrum & Dewi, 2013; Malik & Dwiningrum, 2014).

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Based on Law No. 6 of 2014 concerning Villages, the village government must provide and improve community services. In carrying out this task, they must also carry out good government administration and apply the principles of transparent village governance (Sidiq, 2015; Nawawi, 2019). Serving general administrative needs such as the management of KK, KTP, birth certificates, good conduct letters, and so on is one of the main tasks of the village government.

Manual village services require people to flock to the village and take care of all problems directly. The administrative services provided by the Ciawigajah Village apparatus are considered less effective and less flexible because the community must come to the village regularly, not to mention if the village apparatus responsible for this administration is not there. The role of village governments must be increased to provide services to the community.

Technological advancements, including office governance, affect different sectors of people's lives. One way to improve Ciawigajah's administrative services is to arrange administrative services online, one of which is by using the Web Platform. A Web Platform is a web-based service or tool that allows users to create and manage websites without in-depth technical knowledge of programming or web design. The service offers an easy-to-use interface for designing, editing, and publishing content on websites, often with templates and drag-and-drop systems available. Google Sites, Wix, and WordPress.com are examples of platform websites (Hargis, J. 2014). The presence of the Web Platform allows the community to complete their administrative needs anywhere and anytime they want, they only need to come to the village government office when the necessary files are completed. The village hall is described as follows:

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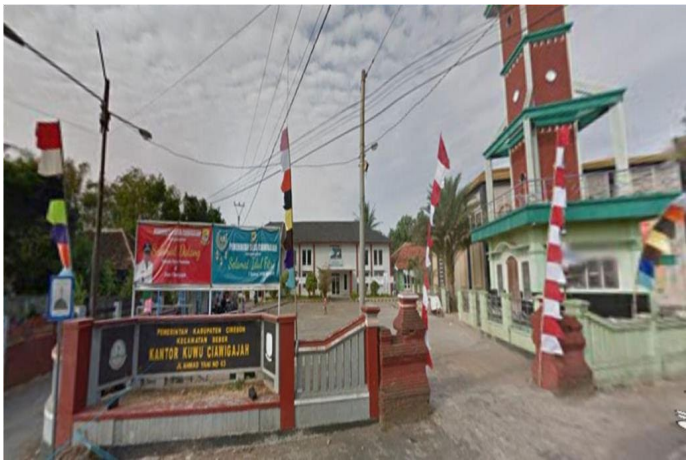

Figure 1. Ciawigajah Village Hall

The village-owned company is already running well, while others are still starting. We are trying to build a start-up business unit from the village's potential. Still, due to time and cost constraints, we are limited to the results of waste processing, wheat farming from sweet potatoes that the town may have, and online administration services for residents. This research explains how village communities can convert plastic waste into alternative fuels.

Overview of Society

Ciawigajah Village is an advanced village in terms of economic development, especially in village business units. The primary source of agriculture in Ciawigajah Village. In the form of rice food, tubers, chili peppers, etc. Based on data taken in December 2020, Ciawigajah Village has an area of 169.7 Ha. The number of residents can be seen in the following table:

Table 2. Number of residents and number of heads of families in Ciawigajah Village

Information		Number (Souls)
Inhabitant	Man	3.776
	Woman	3.485
Total		7.261
Head of Family	Male KK	1.783
	Female KK	285
Total		2.068

DOI: https://doi.org/10.62885/abdisci.v1i12.442

The boundaries of Ciawigajah Village include 1) South Kuningan Regency, 2) North Sindanghayu Village, 3) East Kamarang Village, and 4) West Cibuntu Village. In general, Ciawigajah Village is located in a highland with a hilly soil structure and cool air. This climatic condition is what results in Ciawigajah Village being very suitable in terms of agriculture, plantations, and the like, even though most of the area is still in the form of agriculture or rice fields; here is a map of the Ciawigajah Village area:

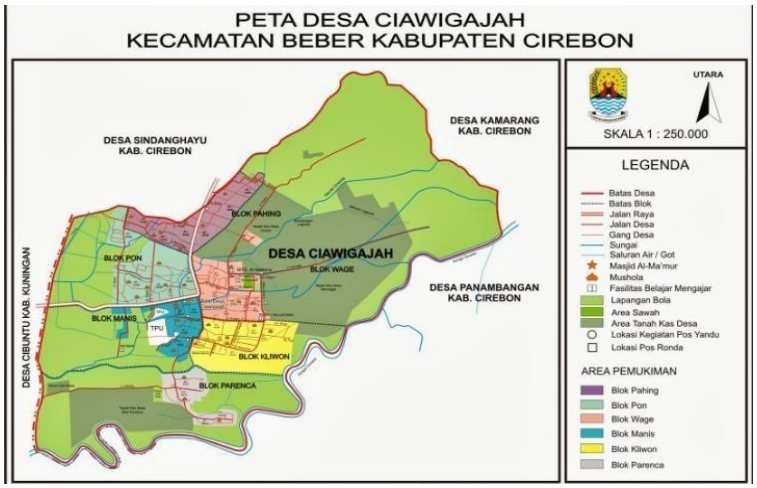

Figure 2. Map of Ciawigajah Village

In addition to the potential for natural resources, there is still a pile of garbage in Ciawigajah Village, located in several places. This is due to the need for more public awareness of environmental cleanliness and good and correct waste management. The Ciawigajah Village Government itself has carried out several waste-related programs, such as the Household Waste and Plastic Waste Collection Program. This withdrawal is carried out twice a week, while the number of garbage collection officers still operating is two people. Based on data obtained from the head of BUMDes, the waste collection program has so far been attended by 500 surrounding community houses and neighboring village communities. With the number of heads of families reaching 2,068, Ciawigajah Village should be able to optimize the waste processing process better and be directed to various processed waste products that can be reused. One of the programs that needs to be done to overcome the waste problem is to hold a

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waste bank and plastic waste management is an alternative fuel that can be used to support facilities in the village or marketed with the help of technology (Zain Alimudin & Aji Mahendra, 2024; Maily et al., 2024) so that they have high sales and can help the economy in Ciawigajah Village, here is a picture of the processing site

METHOD

The following is a diagram of the implementation of the program:

Figure 3. Waste Processing Plants and Plastic Shredding Machines

The method of implementing the program can be seen from the following table 3:

Table 3. Implementation Method of Waste Program and Plastic Shredder

No.	Scope	Activities
1.	Initial analysis	Data analysis is based on potential and needs in Ciawigajah Village
2.	Planning a business unit	Based on the potential that exists in Ciawigajah Village, taken three potentials that will be carried out in 2024
3.	Formulate Success indicators	Making artificial fuels from plastic waste and the manufacture of natural fertilizers from animal manure
4.	Community approach	Carried out by social interaction to Ciawigajah village officials, community leaders, youth organizations, PKK women and elderly people

DOI: https://doi.org/10.62885/abdisci.v1i12.442

5.	Intervention	The intervention aims to maximize the village's potential, needs, and equipment, namely maximizing the processing of plastic waste that was previously only burned into alternative fuel products that have high economic value.

DISCUSSION

Success indicators are standard measures of the success of the implementation of the *Asset-Based Community Development program*. Success indicator data is obtained by measuring the profiles of the business units that are accompanied and developed before and after the program, both old and new businesses, individual businesses or group businesses. The profile of the business unit, namely the management of Waste into Alternative Fuel

1. Increasing community skills in processing plastic waste into Alternative Fuel to replace Coal.
2. The existence of products produced from plastic waste in the form of Alternative Fuels

Alternative Fuel Program from Plastic Waste

The production process of Alternative Fuels initially experienced a need for more raw plastic materials. However, a solution to the problem of the availability of plastic waste was found after building a mantra with various neighboring villages around Ciawigajah Village. The second problem is the need for workers who are willing to carry out the production process.

Table 4. Progress Indicators of Recycling Waste to Fuel

No.	Indicators External	Progress	Percentage (%)
1.	Village MSME profile document	Village MSME profile documents have been made	100
2.	3R Education (Reduce, Reuse, recycle)	Digital learning uses QR Codes, making it easier to learn waste processing.	100

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3.	Product Marketing	Marketing of plastic waste recycling products into fuel in collaboration with PT. Indocement Palimanan is carried out with an offline system	100
4.	BUMDes Application Creation (additional indicators)	The creation of this application is used to increase village fund income in the development of facilities and infrastructure in Ciawigajah Village	100

After a discussion with the village, in this case, BUMDes as the patron of wireless activities, an agreement was reached that the workers who carry out the production process usually take care of and collect waste from residents' homes. Training has been carried out on the online product marketing process. Therefore, the external indicators of progress in the production process of alternative fuels and marketing can be seen in Table 4.

Table 5. Organic Fertilizer Marketing Progress Indicators

No	Output Indicators	Progress	Percentage
1	Organic Fertilizer Product Profile Document	An organic fertilizer product profile document has been made.	100
2.	Product Marketer (Additional indicators)	Marketing of Organic Fertilizer products through offline and online marketing systems using Shopee E-Commerce and Tokopedia.	100

Table 6. D'Sarongge Park Education Indicators

No	Output Indicators	Progress	Percentage
1.	D'Sarongge Park profile document	A profile of D'sarongge Park has been made.	100

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2.	D'Sarongge Park Education	Digital learning uses barcode scans on each plant.	100
3.	Advertising Media	The creation of social media as a material for knowledge and information about D'Sarongge Park using social media (Instagram, Facebook, Tiktok)	100

Program Sustainability Potential

The program to develop waste recycling into alternative fuels Fuel from plastic waste is an innovation, especially in Region III Cirebon, because a new product still has much potential to be explored and renewed. This alternative fuel from plastic waste can be a solution for Ciawigajah Village, especially in waste management that was previously not of economic value, to become of financial value. It can potentially increase village income and open job vacancies for villagers.

The parties that benefit when the alternative fuel program from plastic waste is continued are the residents of Ciawigajah Village, youth organizations, BUMDes, and villages around the Ciawigajah area. Producing alternative fuels requires a lot of raw materials in the form of plastic waste, which has the potential to improve the economy of Ciawigajah Village and neighboring villages.

With the increase in production capacity, the waste recycling program into alternative fuel from plastic waste has the potential to become a superior product in the future that can improve the village economy.

CONCLUSION

Waste management and limited access to technology in villages are two significant problems for many developing countries, including Indonesia. Innovative solutions to convert waste, especially plastic, into alternative fuels such as biodiesel or biogas. This reduces waste

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and produces environmentally friendly renewable energy while providing economic opportunities for village communities.

In addition, village digitalization through digital platforms provides easier access to education, health services, and economic opportunities. The use of this technology also helps manage local resources, market products, and increase the transparency and effectiveness of village government.

For example, Ciawigajah Village shows its economic potential with business units such as mineral water treatment, waste management, agro-tourism, agriculture, and livestock. In this village, digitalization and innovation in processing waste into alternative energy sources can greatly help sustainable development and improve community welfare.

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