Review of Islamic Law Regarding the Application of the Blue Economy to the Use of Organic Waste as Alternative Feed Materials (Study of Freshwater Fish Farming Community)

Nining Setyowati Handayani[1], **Muhamad Subhi Apriantoro**[2], **Vanissa Assyafi**[3] **Nasya Tanasya**[4] , **Risma Tamma Adabi**
[1] Department of Sharia Economic Law, Universitas Muhammadiyah Surakarta, Indonesia
[2] Department of Sharia Economic Law, Universitas Muhammadiyah Surakarta, Indonesia
[3] Department of Sharia Economic Law, Universitas Muhammadiyah Surakarta, Indonesia
[4] Department of Sharia Economic Law, Universitas Muhammadiyah Surakarta, Indonesia[4]
i000180098@student.ums.ac.id[1], msa617@ums.ac.id[2], i000210139@student.ums.ac.id[3]
i000220021@student.ums.ac.id[4], i000210026@students.ums.ac.id

Abstract

This study seeks to determine how the Blue Economy is implemented in using organic waste as an alternative feed ingredient and what Islamic law has to say about managing organic waste as an alternative feed ingredient. Using a deductive case study methodology, the qualitative research method employs a case study approach. The data sources consisted of primary data obtained from direct interviews with the cultivator's head and secondary data obtained from journal references. According to the findings of this study, the Blue economy can be implemented by utilizing organic waste as an alternative feed ingredient for catfish in the following ways: 1). Community outreach regarding activities, 2). The community separates its trash, and officers collect it from the residents' homes, 3). Waste will be provided for consumption by larvae, 4). In addition to pellet feed, Maggots will be fed to catfish as an alternative food source. This activity has the potential to reduce environmental pollution and produce no waste. Maggots can save money on pellet purchases and have promising prospects as an alternative feed that reduces waste accumulation. Using alternative fish feed ingredients with Maggot does not violate Islamic law and does not affect the halal status of the fish fed the alternative elements.

***Keywords**: Blue Economy, Organic Waste, Alternative Feed, Maggot, Islamic Law.*

Kajian Hukum Islam tentang Penerapan Ekonomi Biru terhadap Pemanfaatan Sampah Organik sebagai Bahan Pakan Alternatif (Studi Komunitas Budidaya Ikan Air Tawar)

Abstrak

Penelitian ini bertujuan untuk mengetahui bagaimana Ekonomi Biru diterapkan dalam memanfaatkan sampah organik sebagai bahan pakan alternatif dan apa yang dikatakan hukum Islam tentang mengelola sampah organik sebagai bahan pakan alternatif. Dengan menggunakan metodologi studi kasus deduktif, metode penelitian kualitatif menggunakan pendekatan studi kasus. Sumber data terdiri dari data primer yang diperoleh dari wawancara langsung dengan kepala penggarap dan data sekunder yang diperoleh dari referensi jurnal. Menurut temuan penelitian ini, ekonomi biru dapat diimplementasikan dengan memanfaatkan sampah organik sebagai bahan pakan alternatif ikan lele dengan cara sebagai berikut: 1). Sosialisasi masyarakat terkait kegiatan, 2). Masyarakat memisahkan sampahnya, dan petugas mengumpulkannya dari rumah warga, 3). Limbah akan disediakan untuk dikonsumsi oleh larva, 4). Selain

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pakan pelet, Maggot akan diumpankan ke ikan lele sebagai sumber makanan alternatif. Kegiatan ini berpotensi mengurangi pencemaran lingkungan dan tidak menghasilkan limbah. Belatung dapat menghemat uang untuk pembelian pelet dan memiliki prospek yang menjanjikan sebagai pakan alternatif yang mengurangi penumpukan limbah. Menggunakan bahan pakan ikan alternatif dengan Maggot tidak melanggar hukum Islam dan tidak mempengaruhi status halal ikan yang diberi makan unsur alternatif.
harus dibuat singkat, menarik, sederhana, dan mudah dipahami tanpa membaca keseluruhan artikel. Untuk itu, hindari menggunakan jargon, singkatan dan referensi. Dalam menuliskan abstrak, penulis harus akurat, menggunakan kata-kata yang tepat, dan menyampaikan makna penelitian. Abstrak yang baik memuat permasalahan dan tujuan, bagaimana riset dilakukan (metode), hasil, dan ditutup dengan pernyataan singkat kesimpulan. Dalam abstrak juga selalu disertakan kata kunci (keywords). Keywords digunakan untuk mengindeks sebuah artikel dan merupakan label dari sebuah artikel. [Century 10 pt]

Kata kunci: Ekonomi Biru, Sampah Organik, Pakan Alternatif, Belatung, Hukum Islam

1. Introduction

Indonesia is the largest archipelagic nation with an abundance of fisheries. The potential for abundant resources should have increased or stabilized the economy in Indonesia, but more than human help is needed to utilize the potential for fishing properly and correctly.

Indonesia, as one of the nations that recognized the recognition of archipelagic states in the 1982 United Nations Convention on the Law of the Sea, should have ratified the convention into Law Number 17 of 1985 concerning Ratification of the United Nations Convention on the Law the Sea (United Nations Convention on the Law of the Sea). Indonesia is a nation that benefits significantly from the UNCLOS of 1982. In chapters II, III, and IV of the 1982 Law of the Sea Convention, coastal states and archipelagic states have sovereignty over internal waters, archipelagic waters, and territorial seas, as well as waters including straits, the upper portion of the waters, namely air space, as well as the seafloor and land. Includes the natural resources contained within the section below. Even though Indonesia has benefited from this convention, there are drawbacks, including the absence of a guarantee of state rights and the fact that it has not yet been implemented, so other options must be sought.

Susilo Bambang Yudhoyono, the sixth President of Indonesia, explained the blue economy concept in a paper titled "Moving towards sustainability: together we must create the future we want." An idea about the 'Blue Economy' or 'Blue Economy' helps raise global awareness about the management of ocean and coastal resources (LAUT, 2012). In his two terms as president of the Republic of Indonesia, Joko Widodo emphasized strengthening economic growth based on innovation and technology, particularly in the direction of a green economy and a blue economy. On Monday, August 16, 2021, this was conveyed during the annual session of the MPR, DPR, and DPD (Photo, 2021). The global economy is intricately intertwined with corporations, governments, and businesses. All three must work together to implement developments that benefit them and numerous other parties. The appropriate concept is, therefore, sustainable development (Saefuddin, 2015). Existing economic policies in Indonesia continue to rely on the idea of a green economy dependent on resources from the mainland, including plantations, agriculture, and forestry.

According to some, if the marine economy is used as a national economic development market, it will have extensive ties because it will drastically alter various Indonesian names, political budget policies, and laws and regulations. Economists, the Indonesian parliament is relatively less transparent on maritime and fisheries issues, so they frequently stray and generate innovative new ideas (Ghalidza, 2020).

In Indonesia, there are numerous opportunities for aquaculture, such as catfish farming. Catfish is one of the easiest freshwater fish to cultivate, and because it is inexpensive, it has a high level of public consumption.

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Table 1. Consumption of catfish in Central Java

Year	Catfish Production (Tons)
2013	75,236.27
2014	113,167.47
2015	112,761.74
2016	122,292.16
2017	105,874.13
2018	143,863.92
2019	155,540.64
2020	71,681.70

Source: KKP Statistics (Ministry of Maritime Affairs and Fisheries) Information: Figures are very, very provisional ; Values are very provisional ; Provesional figures.

Feeding is the most crucial aspect of fish farming. Fish feed requires a balanced composition of raw materials and abundant nutrients, particularly protein sources (Maulidiah, 2020). To convert household waste into animal feed, maggot larvae/insects are cultivated; grubs are high in protein. In addition to being used as animal feed, maggot cultivation can also be sold. Following is a presentation of maggot nutrition in Table II, demonstrating that Maggot has a high protein content for catfish feed and is quite simple to cultivate.

Table 2. Presentation of nutrition on the BSF maggot

Type	Content	Percentage %
Maggot BSF	Crude protein	41-42 %
	Ether extract	14-15 %
	Calcium	4.18-15 %
	Dry Phosphorus	0.60-0.63 %

Source: (mongabay.co.id) (Ambari, 2020)

Consequently, it is crucial to examine research on implementing the Blue Economy in using organic waste as an alternative feed ingredient and Islamic law's perspective on managing organic waste as an alternative feed ingredient. Interviews and documentation constituted the research methodology. The subsequent chapter of this research is a literature review that illustrates the various aspects of this research to others. The discussion continues with a theoretical overview of the blue economy, organic waste, and alternative feeds. The methodology is described in the subsequent section, followed by the discussion and the findings. This research concludes with conclusions and recommendations.

2. Literature Reviews

Numerous scholarly works examine the blue economy, organic waste utilization, and alternative feed. The following studies are among these:

First, research (Puji et al. , 2016) Explains that the high nutritional value of fish waste makes it an ideal ingredient for catfish feed. The analysis revealed that the K.4 treatment resulted in the most significant relative growth in length (72.64%) and weight (488.97%), with the highest protein content in meat (20.97%). In previous studies, fish waste was the primary object, but household waste such as leftover rice, vegetables, and fruits were used in this study.

Additionally, research on waste utilization was conducted (Maulidiah, 2020). This study revealed that skipjack tuna has an exceptionally high nutritional value and is safe for human consumption. The inedible portions of skipjack tuna are the head, fins, tail, and bones, which are discarded. Up to 32.27 percent of the protein content of Cakalang fish waste is protein. The high protein content of skipjack tuna is anticipated to make it a viable alternative feed source. The difference between previous studies using skipjack fish waste and household waste is that previous studies used skipjack fish waste, and this study uses household waste.

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If these two studies emphasize waste utilization, other studies emphasize implementing the blue economy. For example, (RescueMHa, 2015). Demonstrates that implementing the blue economy concept can resolve all visible problems. Implementing the blue economy will strengthen every aspect of the problem that must be addressed. Variations in this study In previous studies, research in developed locations, whereas research in this location is still in its infancy. In addition, (Radiarta, Erlania, and Haryadi, 2016) also examine the implementation of the blue economy. Using the framework of marine and fisheries procedures, including the availability of promising aquaculture technology, additional human resources, community-wide dissemination of the Blue Economy concept, and the implementation of capable aquaculture, the Blue Economy must be applied to the field of aquaculture, according to the findings of this study. Accommodate Blue economy policies. This study compares one location to another, whereas the current investigation examines only one place.

Similar research has also been carried out by (Fatmasari, 2017) who examined the level of population density, weight, and length of Maggot (Hermetia Illucens) on different media. . The results indicated that vegetable and fruit waste had the potential to become a maggot food medium, with this waste media increasing maggot length and maggot weight; therefore, a combination of the two wastes was utilized. With a mass of 383 grams and a height of 2.186 centimeters, a larva can produce 0.20 maggots per centimeter, which is the average value. 3 The difference in this study is that the length and weight of the Maggot are precisely calculated.

2.1. Blue Economy Theory

The blue economy is a process in which water serves as the raw material. The blue economy can be utilized to improve an economy in a poor state and generate numerous sustainable activities. A model for increasing marine and fisheries industrialization that emphasizes growth rates generates employment and promotes environmentally friendly technological innovation (Rani and Cahyasari, 2015). Sustainable development is a new way of thinking that prioritizes prudent and accountable resource management for the benefit of current and future generations. This concept is a development concept that satisfies present needs without diminishing future needs (Rosana, 2018). The development of the blue economy, due to the world economic system, leads to excessive exploitation and environmental damage without knowing the risks that will occur.

The principles of the blue economy can become a cornerstone in development planning, primarily prioritizing efficiency, sustainability, zero waste, and comprehensiveness (Chandra, Rustam and Safitri, 2021).

The objectives of Indonesia's blue economy policies are to make natural resources more efficient, to add a variety of economic activities that have added value and are competitive with the concept of sustainable development, to increase the comfort and convenience of local people in regards to economic resources, to be able to boost the economy through innovative means that increase the usefulness and added value of natural resources, and to be able to develop natural resource management.

2.2. Organic Waste

Waste is separated into two categories: organic and inorganic. Organic waste is all waste that contains carbon (c) compounds, which includes waste from living things (e.g., human and animal feces containing protein microbes, urine generally containing Nitrogen and Phosphorus), food waste (e.g., vegetables, meat, rice, also known as perishable waste), and other waste containing carbon (c) (Hasibuan, 2016). Organic waste has high levels of nutrients and energy to be used as a food source for animals. In contrast, inorganic waste cannot be decomposed by microorganisms. Examples are plastic, rubber, paper, etc. (Hasibuan, 2016).

The high number of individuals with excessive consumption needs causes food waste. In addition, there needs to be more precision when purchasing food, as evidenced by the purchase of vast quantities. Minister of National Development Planning/Head of Bappenas Suharso Monoarfa stated that food loss and waste in Indonesia ranged from 23 to 48 million tons per year, or 115 to 184 kilograms per year, based on data from 2000 to 2019.

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Table 3. Composition of food waste

Physical Composition %		Chemical Composition %	
Rice	38.72	Humidity	38.4
Bakery Products	18.74	Carbohydrate	25.56
Meat	25.15	Raw Protein	17.56
Fat	13.03	Crude Fat	15.27
Bone	2.19	Fiber	0.3
Fruits and Vegetables	2.16	Ash	3.21

Source: PT Amrita Enviro Energi (Dr. Sugiarto Mulyadi, 2019).

Existence of food loss and waste has an impact on environmental aspects and affects the economy, which reaches Rp. 213 trillion - Rp. 551 trillion per year, or the equivalent of 4-5 percent of Indonesia's Gross Domestic Product (Kusumawardhani, 2021). Vegetable and fruit waste, including wilted, unfit-for-human-consumption vegetables and rotten, unfit-for-human-consumption fruits. In the meantime, rice waste can be utilized directly as poultry feed. To achieve desirable outcomes, however, rice waste can be processed into animal feed that has nutritional value and is nourishing. So household waste can be profitable for breeders and be used as fish food, thereby reducing pellet use.

2.3. Alternative Feed

The alternative feed can be used by cultivators and can be made by themselves by utilizing leftover food or organic waste that has nutritional value, namely maggot cultivation. Apart from using surplus food, you can also use fertilizer or animal manure (Septiawati, Astriani and Ariffianto, 2021). A maggot can be called a decaying organism because it eats organic waste (Mokolensang, Hariawan and Manu, 2018)

3. Methods

The authors of this study employed qualitative writing methods. In this study, a deductive case study methodology is utilized. In this study, interviews and documentation were used to collect information. Sources of information derived from primary information gathered through direct discussions with informants. The author conducts candid interviews by providing several questions on the subject matter, which the informant will examine; if any questions are deemed inappropriate, they will be replaced with words that are consistent with the research theme. Then, secondary data are gathered from various references, such as scholarly journals and articles pertinent to the discussion(Apriantoro, Zaky, and Febrianti 2022; Ghani and Apriantoro 2023).

4. Results

4.1. Implementation of the Blue Economy in the utilization of organic waste as an alternative feed ingredient

Researchers interviewed a respondent, specifically the chief manager. Respondents were asked to answer multiple questions on the topic. After collecting and analyzing the data, the researchers determined how the Blue Economy is implemented by using organic waste as an alternative feed ingredient for catfish.

Consequently, based on the findings of these interviews, it was determined that the application of economics at research sites in the fisheries sector involved the transformation of organic waste into alternative feed ingredients to replace pellets. In this activity, the village government seeks to follow up on previous endeavors involving processing waste banks by local youths and young women. Many people have contributed to the Garbage Bank by donating recyclable trash that can be converted into cash. In this instance, the activity is conducted in conjunction with scrap collectors. People can bring their trash directly to the site of the waste collection process. Then, officers immediately sort used books, glass, zinc, bottles, etc., into their respective categories. Everything will be sorted before being weighed. Following the sorting and weighing process, the collectors will collect the trash, and the proceeds will be deposited into the treasury for later collection. The waste bank activity was halted with a heavy heart after it had been going on for a long time and attracted many participants for another reason. Recent years have witnessed the

emergence of a novel activity, namely the continuation of waste management activities while employing the blue economy concept.

The mechanism for implementing the organic waste management program into catfish feed is through 4 stages, namely:

1. Promotion

   Officers socialize with individuals about this activity, explaining how waste is treated, the activity's purpose, how the action is carried out, etc.

2. Organic Waste Collection

   The collection of organic waste is conducted by officers who travel from home to home. Before that, each household was required to separate organic and inorganic waste, making it easier for officials to process it further. During the trial period, officers collect organic waste at no cost; however, a monthly fee of Rp 5,000 will be charged after the trial period concludes.

3. Organic waste is used as feed for Maggot.

   After collecting organic waste, the next step is to feed maggots with organic waste.

Figure 1. The process of meeting between male maggot and female maggot

In this process, male and female larvae will marry, the female Maggot will release its eggs, and the female Maggot will die.

Figure 3. Feeding in the form of cucumbers for maggot feed.

Maggots can be fed a variety of organic wastes, including uneaten rice, meat, vegetables, and fruits that are no longer edible.

4. Giving Maggot to be used as catfish feed

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Giving maggot feed to be used as catfish feed is only sometimes, but it is done 2-3 times a week.

Figure 3. Feeding in the form of cucumbers for maggot feed.

Other alternatives to conventional feed ingredients include water hyacinth, worms, snails, and even tofu dregs. Catfish farming requires substantial pellets to sustain the fish's growth. Therefore, alternative feeds rich in nutrients are needed so that catfish can easily digest them.

Table 4. Pellet & catfish prices

Price of pellets/sacks	The cost of catfish/kg
Rp. 350,000	Rp. 20,000

The amount of pellets fed to catfish depends on their size and age; the more significant and older the catfish, the more shots they consume. With a mixture of Maggot and pellets in a ratio of 30% pellets to 70% maggot or 50% pellets to 50% maggot, depending on the size and age of the catfish.

4.2. Review of Islamic law in the processing of organic waste as an alternative feed ingredient

Alternative maggot food sources include food waste, fertilizer, and animal manure. The legal status of food waste, fertilizers, and animal waste is unfit for consumption. Both food waste, fertilizer, and animal manure originate from halal animals such as chickens, cows, goats, etc., and food waste, fertilizer, and animal manure originate from unclean animals such as pork, rats, dogs, etc. There are numerous divergent views on the legal status of waste/manure.

There are numerous divergent opinions regarding the legal status of food waste, fertilizers, and manure. Regarding destruction and filth, the Syafiiyah school of thought is impure (Abidin, 2019). According to Imam Abu Said Al-Ustukhri and Imam Ar-Rawyani, waste is not dirty in his opinion. Maliki and Hanafi share the same perspective as Imam Abu Said Al-Ustukhri and Imam Ar-Rawyani. According to most scholars, neither living nor dead maggot-bearing animals are impure.

Table 5. Different views on waste, fertilizer, and animal waste laws

No	View	Information
1	Shafii madzab	From the opinion of the Syafiiyah madzab, the legal status of waste, fertilizers, and animal manure is unclean to eat. Both from halal animals and unclean animals.
2	Imam Abu Said Al-Ustukhri and Imam	Of the opinion that waste, fertilizer, and animal

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	Ar-Rawyani	manure are not unclean objects.
3	Maliki Madzab and Hanbali Madzab	The opinion is the same as Imam Abu Said Al-Ustukhri and Imam Ar-Rawyani.

Catfish is a carnivorous fish living in freshwater and can be considered a predatory animal. Catfish thrive in murky water; therefore, there is no need to change the water for them to survive. Regular feeding is essential for catfish growth, but it is also important to consider the type of food provided. The most significant issue is how the community cultivates catfish. Regarding the benefits of using maggots as catfish feed, both cultivation and sale are permitted (mubah). Small flies/maggots are prohibited for human consumption under the law (Baits, 2020).

5. Discussion

5.1. Implementation of the Blue Economy in the utilization of organic waste as an alternative feed ingredient

The implementation of the Blue Economy in the use of organic waste as an alternative feed ingredient for catfish is discussed first. The presented data indicates that the blue economy concept incorporates elements of sustainable natural resource management. Sustainability is associated with the efficient utilization of natural resources without waste, innovation, social responsibility, and originality. Practical is the application of the blue economy in research locations, specifically in fisheries, by transforming organic waste into alternative feed ingredients to replace pellets.

The village's government facilitates and participates directly in waste management activities but employs the concept of the blue economy. The mechanism for implementing the organic waste management program into catfish feed consists of four stages, including the following:

1. Promotion

It is hoped that the community will support socialization activities because they involve many individuals. So that if people already know the procedure, they can practice it in their homes in the future.

2. Organic Waste Collection

With the organic waste collection activity, it is hoped that the community will be able to differentiate between organic and inorganic waste, making it easier for officers to process. The data indicate that officers initially collected organic waste for free during the trial period but charged a fee of Rp 5,000 per month after that. The funds will be deposited into the treasury to be reprocessed by purchasing damaged goods or pellets.

3. Organic waste is used as feed for Maggot.

The next stage of the presented data indicates that, following the collection of organic waste, the organic waste is fed to larvae to ensure their proper development. Cultivating maggots involves purchasing several adult male and female larvae from a vendor, then rearing them until the female Maggot lays eggs and is ready to be used as catfish food. During the maggot life cycle, adult males and females mate to produce eggs, and after mating, the female Maggot releases her eggs in a moist area and avoids direct sunlight. Depending on the temperature in the incubator, eggs typically hatch between 12 hours and 3-4 days after being laid.

In addition, providing maggot feed in the form of intact cucumbers entails the manager providing them with intact cucumbers, which they will subsequently consume on their own. The more food a maggot receives, the faster it grows, and it also contains nutrients.

4. Giving Maggot to be used as catfish feed

Feed's importance in aquaculture necessitates considering its nutrient content when selecting meals. If the feed quality is high, so will the quality of the fish produced. The feed's ingredients are strongly influencing the quality of fish feed, which must include protein, fat, carbohydrates, vitamins, and minerals. The age and size of the fish and the

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type of fish being cultivated affect the nutritional needs of the fish. The larger the fish, the greater the feed's nutritional value. This causes the fish feed to be costly, and farmers must exert great effort to meet demand. Catfish farming requires substantial pellets to sustain the fish's growth. Therefore, it is necessary to provide catfish with nutrient-rich alternatives that are easily digestible.

Therefore, it was decided to use maggots because their cultivation is simple, and their food source is readily available. If water hyacinth were used, it would take time to chop the plant into small pieces, and worms would either have to be dug up from the ground, which would be time-consuming, or purchased from a worm vendor at an additional cost. Maggot has proven effective because it reduces the expense of producing expensive pellets. Additionally, larvae can be cultivated on their own, as grubs are extremely valuable on the market. According to information provided by individuals, maggot eggs cost Rp. 90,000 per gram. Due to the high cost of maggot eggs, it is preferable to cultivate them oneself so that they can be used as animal feed or sold.

5.2. The view of Islamic law in the processing of organic waste as an alternative feed ingredient for catfish

According to the findings of this study, there are numerous divergences of opinion regarding the legal status of waste.

The idea of the Syafiiyah school of thought regarding waste/dirt is unclean (Abidin, 2019). At the location where the research was conducted, it was discovered that the only food sources consumed by maggots were odorous leftover rice, rotten vegetables or fruits, and bones from halal animals; no food sources were derived from unclean ingredients. From the perspective of the Syafiiyah school of thought, this widespread belief is a guideline for Muslims when selecting alternative feed ingredients.

The second view of waste held by Imam Abu Said Al-Ustukhri and Imam Ar-Rawyani, along with the Maliki and Hanbali Schools, is not impure. In maggot cultivation, maggots at the research site primarily digest organic waste, but some are also fed animal manure/fertilizer. The cultivation of larvae is also permitted by law (mubah) so long as the waste consumed is halal. Thus, there are scholarly differences in determining the legal status of halal waste; however, the Syafiiyah school holds that the legal status of waste is impure and that the precautionary principle must be applied when feeding maggots.

The correct course of action is to adhere to the Syafiiyah school of thought that animal waste/dung is impure, so caution is required in the practice of Shari'a law as well as adjustments to the general public that animal waste/dung is impure and repulsive and should not be consumed.

According to most scholars, neither living nor dead maggot-bearing animals are impure. Because insects lack a system of red blood cells. Therefore, the cultivation of maggots is permissible (mubah) so long as humans do not consume it and the food consumed by it is not impure. By those at the research site, Maggot's daily food is just food scraps such as leftover rice, stale vegetables, rotten fruits, and bones from animals that are lawful to eat. No feed is allowed. Contain haram in the food consumed by the Maggot. In providing a meal, a sorting process is also carried out first so that there are no ingredients that Maggot cannot eat.

6. Conclusion

Two conclusions can be drawn: 1). Utilizing organic waste as an alternative feed ingredient is a mechanism for implementing the Blue Economy. This activity begins at the waste bank and becomes waste management with the blue economy concept. With the aid of larvae, this endeavor aims to transform organic or household waste into alternative feed. 2). There are various opinions regarding using organic waste as an alternative feed, including the view of the Syafiiyah School that waste is unclean. The second view of waste held by Imam Abu Said Al-Ustukhri and Imam Ar-Rawyani, along with the Maliki and Hanbali Schools, is not impure. The cultivation of larvae is also permitted by law (mubah) so long as the waste consumed is halal. In determining the legal status of halal waste, there are thus scholarly differences; however, the Syafiiyah school holds that the legal status of waste is impure and that the precautionary principle must be applied when feeding maggots.

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There are three possible evaluation criteria: 1). Waste management activities must be more active, 2). Participation of communities in waste management activities is possible, 3) According to an Islamic perspective, future research is anticipated to examine more about the use of organic waste as an alternative feed within the context of a blue economy.

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