Biogas as A Solution for Sustainable Energy Development in Maqashid Syariah Framework

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Abstract—Islamic economy as a way of life began to be studied and applied in various aspects. However, on the other hand, there is still a vacuum in which the study on Islamic economics is now more focused on the study of business, finance, and banking. While the broad outline of basic economic problems that comes from the fulfillment of needs and desires with all the implications on the long-term or often referred to as sustainable development in the concept of Islamic economics is still minimal discussion. Where in this journal the authors will raise about the issue of sustainable development with the focus of studies in the energy sector where the research area conducted found a total economic value of Rp 72,312,000 consisting of direct benefit value, indirect benefit value, choice value, and value of existence on sustainable energy development efforts in one village where the research is conducted with some other derivative benefits that can be studied in the concept of maqashid al-syariah.

Keywords—Islamic Economy, Sustainable Energy Development, Total Economic Value

I. INTRODUCTION

Lately, the Islamic economy as a way of life begins to be discussed in various scientific studies. However, the discussion about the existing Islamic economics are more focused on the discussion in the fields of business, finance and banking. On the other hand, the true Islamic economy, as expressed by Juhaya [8], is a unit of science that discusses multifaceted studies that cover not only business and finance, but also banking sector.

The basic problems of the economy itself are the unlimited human needs and the limited means to fulfill such needs which then result in the scarcity and destruction of nature as it occurs today. Islamic economy which is originated from Qur’an and Sunnah has long predicted this kind of issue as it is stated in surah Ar-Rum 41: “it has been seen that the destruction on land and at sea is caused by the deeds of the hands of men, that God may feel to them some of the consequences of their deeds in order that they may return to the right path.”

While this state of affairs in the conventional economy start realized at the end of the 20th century when scientists began to consider a new concept of sustainable development concept that began formulated in the late 1980s in response to develop strategies so far that only focus on proven high economic growth goals has led to degradation of production capacity and environmental quality.

Sustainable development was first defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” This definition recognizes the integrated nature of the relationship between humans and their environment. It highlights the spatial and temporal dimensions of sustainable development as fundamental in societies where an increasing number of people are able to lead decent lives both now and in the future.

Equity and fairness are additional key principles of sustainable development in that priority is given to improving the conditions of the poor and to distribution across generations. By recognizing future generations as key stakeholders in development (but ones that are not present to defend themselves), sustainable development exposes a key deficit in the status quo. Free markets do not protect future users; public goods such as fresh water and clean air are vulnerable to abuse and over-exploitation unless economic activities are regulated.

Governments likewise have no incentives to protect future consumers; the design of democratic political systems means that they are preoccupied with short-term gains that reflect the needs and wants of their constituencies. Sustainable development thus demands a commitment in which current users and policy-makers act as planetary stewards by taking actions and making decisions that will protect future stakeholders.

Table 1. Sustainable Development Structure

<table>
<thead>
<tr>
<th>Primary Dimensions</th>
<th>Secondary Dimensions</th>
</tr>
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<tbody>
<tr>
<td>Safeguarding long-term ecological sustainability</td>
<td>Preserving nature intrinsic value</td>
</tr>
<tr>
<td>Satisfying basic human needs</td>
<td>Promoting protection of the environment</td>
</tr>
<tr>
<td>Promoting intergenerational equity</td>
<td>Promoting public participation</td>
</tr>
<tr>
<td>Promoting intergenerational equity</td>
<td>Satisfying aspirations for an improved standard of living</td>
</tr>
</tbody>
</table>

In other words, sustainable development efforts must be oriented towards three dimensions of sustainability, namely the sustainability of economic enterprises (profit), the sustainability of human social life (people), and the sustainability of the natural ecology (planet) which is often referred to as a triple-P pillar.

Economic growth could even be seen as a vehicle for facilitating the four primary dimensions of sustainable development outlined above. However, it was not intended to have the dominant role it has come to occupy in the 3Ps model. The global adoption of the 3Ps model has arguably alienated cultures that are not focused on economic growth or capitalism. It may also explain their weak progress in certain areas and reluctance to engage in sustainable development debates and goal setting at the international level.
As for the energy studies that authors use as the focus of this study relates to the natural conditions of some countries, especially in Indonesia which is in a tropical country and has high rate of rainfall, it gives a big potential for energy sector, 14.1 million Indonesian households work in the agricultural sector. Agricultural potential is important to several countries because in addition to fulfilling national food security function, as Soekartawi said [9], agriculture in many countries including Indonesia is one of the sectors that play an important role in the provision of employment in large numbers for the community.

However, on the other hand, the agricultural potentials in Indonesia is still becoming a major problem that threatens the sustainability of Indonesia’s agricultural sector. That major problem is then divided into two aspects:
1. Human Resources within farming communities.
2. Natural Resources within environment and farming production.

The problems with the human resource aspect are the unqualified farmers, the limited access of farmers to the capital and technology, as well as the institutional capability of farmers. These problems result in the low average of the welfare of Indonesian farmers, especially in the effort fulfillment of daily needs.

In the concept of economics, the problem of the fulfillment of the necessities of life arises because of the unlimited human needs that increase over time, as Mangkoesubroto said [6], while the limited and diminishing resources are unable to meet human needs forever. Acknowledging this bitter reality, people are left with no choice than to choose the only option which will benefit them most by maximizing the supporting tools, or people will tend to choose an option which requires the smallest number of victims among others for the sake of fulfilling a certain need.

In farming societies, the problem is often about choosing to apply organic or inorganic farming patterns in developing the farms. Today, the majority of farmers tend to prioritize the application of inorganic farming patterns in developing agricultural land.

This is because the use of inorganic materials provides more benefits in short-term period as well as more practical use when compared to organic materials. Furthermore, farmers can see faster results which will lead to greater income compared to the use of organic materials so that the use of inorganic materials on agriculture has been an option frequently used by farming communities.

However, on the other hand, the use of inorganic materials on agriculture has now been shown to provide more negative impacts to the land environment and agricultural production. These may include pollution of land that is potentially damaging to the soil and contaminating the irrigation which may harm consumers’ health in a long-term period.

Responding to these two issues, sustainable development effort in the agricultural sector is an effort that needs to be prioritized. Where empirical observation suggests that no country can achieve a take-off stage toward sustainable economic development driven by industry and service sectors based on modern science and technology without preceded by the achievement of sustainable development stages in the agricultural sector.

Batu City can be the perfect example when it comes to discussing the development of the agricultural sector. Batu City is one of the cities in East Java Province. Since it is located 600-3000 MASL with high rate of precipitation and springs, Batu City is very potential to develop agricultural sector. In 2014, 53.46% of people in Batu work in agriculture/livestock sector. Therefore, Batu City Government through Regional Medium-Term Development Plan (RPJMD 2012-2017) has established the vision of Batu City development as the center of organic farming.

Developing organic farming by Batu City Government is based on sustainable development effort in Batu City agricultural sector which long-term goal is to develop health-oriented agriculture that can improve farmer’s prosperity. Batu City Government took this move by considering future market potential where organic farm product will be high-priced than the inorganic one; this will maintain the continuity of agriculture land and is also potential to increase farmer's economy in Batu City.

Responding to the policy plan, Batu City government took the first step with a system of cooperation with farmer groups in villages throughout Batu City to jointly seek sustainable development in the Batu City agricultural sector to maintain the environment of agricultural land in the long term while striving to improve the economic level of farming communities in Batu City.

Thus, in this research, authors will take a case study on the effort of organic farming development in Pendem village which has been established as organic rice farming development center which is done by Batu city government by cooperating with farmer community in Pendem village with focus of research on process which have running along with the values gained in the process.

II. METHOD

This research was conducted in Pujon District, Malang Regency, East Java Province. Research location is determined intentionally (purposive) with the consideration that the area is a recommendation from the Regional Development Planning Board of Malang Regency as an area which pilot project is the development of energy development in Malang Regency precisely in the farmer group of Sri Mulyo, Bendosari Village.

The type of data used in this study is quantitative and qualitative data collected through data collection techniques according to each type of data. Sources of data collected are primary and secondary data. Primary data are any data obtained directly from respondents or informants. Conversely, secondary data are any data obtained indirectly through another party or document tracking.
A technique of data collection on quantitative methods was done by distributing the questionnaires to research respondents. While the technique of qualitative data collection was conducted through a depth interview with relevant informants and respondents; while the documentation techniques were carried out by analyzing or browsing research related documents.

Based on data collection techniques which have been described, the instruments of this study are a non-test instrument in the form of questionnaires and interview guidelines. The selection of research sites was done purposively, which is in Srimulyo farmer group as a demonstration plot of organic rice farming development in Batu City, East Java Province.

The determination of key informants was determined using purposive sampling with criteria that require them to understand the field conditions, to be experienced in the development of organic farming, and to own information network about the development of organic farming. The key informants in this study are Mr. Sariono as agriculture and tourism cultivation in Batu city development planning agency along with the ranks of his staff and Mr. Muji as the chairman of the organic farming area group as well as the chairman ranks of members of Sri Mulyo II farmer group in Pendem village, Batu city.

Then, pattern of research approach used in this research is the concept of theory of total economic value. This method is used because it can classify the value of benefits based on how or where the benefits are derived.

The calculation of Total Economic Value in this research is as follows:

$$TEV = (DUV + IUV + OV) + (EV + BV)$$

Total Economic Value = Direct Value + Indirect Value + Tangible Value + Intangible Value + Employment Value

III. RESULT AND DISCUSSION

To date, the organic rice farming development is undertaken in Pendem village, Junrejo sub-district, Batu city cannot be said to run smoothly because of some problems that researchers will explain in the following sections. The development of organic rice farming in Pendem Village is still actively carried out by 15-22 members of the environmental community group initiated by Mr. Muji. Therefore, the researcher will explain the result of interview and data of result from the questionnaire that was filled out by 15 members of the group of Mr. Muji.

1. Direct Value

The value of direct benefits is derived from the multiplication of the amount of farming produce and the price market then reduced by the cost incurred for agricultural production. The development of organic rice farming in the Pendem village, Batu city is conducted by 15 peasants in an area of 13 hectares which is capable of producing about 79,800 kg per harvest at a selling price of IDR 3,500 per kg so that the receipt taken is IDR 279,260,000.

Table 2. Revenue of Biogas Energy Development.

<table>
<thead>
<tr>
<th>Description</th>
<th>Revenue (Rp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipt</td>
<td>279,260,000</td>
</tr>
<tr>
<td>Cost</td>
<td>89,480,000</td>
</tr>
<tr>
<td>Income</td>
<td>189,780,000</td>
</tr>
</tbody>
</table>

Source: Primary data is processed based on local market price.

2. Indirect Value

The value of indirect benefits in this study consists of two parameters namely water supplier land and employment providers. The first indirect benefit value is the value of the benefit suppliers of groundwater. This value is obtained by calculating the quantity of ground water per year multiplied by the land area multiplied by the price of water per cubic meter.

Based on the measurements made by PDAM Batu city related to the needs and the fulfillment of clean water for households in geography, the value the water debit in the Pendem village is at the rate of 120.5 liters per sec. The water quality in Pendem Village is in grade A (excellent and fulfill the quality).

Through the analysis of water needs, it was found that the water needed for an area of 13 Ha is around 725,428.9 liter per day or 264,781,548.5 liters per year or 264,781.55 m³ per year. With its own Grade “A” quality water resources, it can be seen that the water requirement for organic rice farming in the village Pendem can be fulfilled.

The price of water per cubic meter set by PDAM Batu city for the land agriculture is IDR 640 per m³. Thus, the value of indirect benefits of water supply parameters land is IDR 169,460,192.

The value of indirect benefits can also be calculated from the amount of labor usage at the organic farming sector in Pendem village, Batu city. Where the labor comes from the farm family. Where in this study, the labor within the family is also calculated on the basis of wages coming from outside the family (calculated on the basis of calculation of working day) and different wage rates between male and female labor where the cost for male labor ranges from IDR 40,000 to IDR 47,500; while for female workers, it ranges from IDR 20,000 to IDR 30,000 with an average workload of 4 hours a day or until noon with the calculation of the average cost as the following:
Advances in Economics, Business and Management Research, volume 101

Table 3. Average revenue of Biogas Energy Workers

<table>
<thead>
<tr>
<th>Activities</th>
<th>Income/ person (Rp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Land plow</td>
<td>397,826</td>
</tr>
<tr>
<td>- Land preparation</td>
<td>444,783</td>
</tr>
<tr>
<td>- Hatchery</td>
<td>109,174</td>
</tr>
<tr>
<td>- Seedbed</td>
<td>76,522</td>
</tr>
<tr>
<td>- Planting</td>
<td>344,348</td>
</tr>
<tr>
<td>- Fertilization</td>
<td></td>
</tr>
<tr>
<td>- fertilization I</td>
<td>417,826</td>
</tr>
<tr>
<td>- fertilization II</td>
<td>272,862</td>
</tr>
<tr>
<td>- fertilization III</td>
<td>65,780</td>
</tr>
<tr>
<td>- irrigation</td>
<td></td>
</tr>
<tr>
<td>- prevent rats</td>
<td>210,435</td>
</tr>
<tr>
<td>- pesticide spray</td>
<td>57,609</td>
</tr>
<tr>
<td>- keep bird</td>
<td>60,913</td>
</tr>
<tr>
<td>- weeding</td>
<td>109,348</td>
</tr>
<tr>
<td>- harvest</td>
<td>274,696</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,493,825</td>
</tr>
</tbody>
</table>

Source: Primary Data

Thus, the value of indirect benefits of labor usage parameters for each hectare the land where it takes 8 workers per Ha is IDR 27,950,600. The total value of indirect benefits on organic rice farming in Pendem village is as much as IDR 197,410,792.-.

3. Tangible Value

The value of choice consists of environmental conservation parameters that allow for partial removal for the development and conservation of the land and the natural surroundings. As many as 80% of Pendem community have been aware of the potential to be developed as organic rice farming.

While the other 20% still think that the condition of nature and potential of the farm are not a great potential, communities contributes of their income to keep the natural resources that may be used in the future, among others: awareness of potential of Pendem Village by society is dominated by the abundant agricultural potential or at least more than any other area in the Batu city.

In addition, the community also thinks that the programs and activities of the Batu city Government will develop organic farming. Communities can be encouraged to maintain their existence by giving various programs and activities that improve their income significantly, including organic farming. Management directs the other communities to take advantage of easy access and community support to build some agricultural production outlets that can be the first step in building a plant organic farming area.

The community also needs to be given an understanding of land governance and the environment so as not to exploit the potential of agriculture without considering soil capacity of handling artificial chemical elements. Therefore, the Government provides counseling, technical assistance, and natural fertilizer subsidies so that farmers keep on guard sustainability of land in Pendem Village.

As many as 80% of Pendem's society put aside their income to keep the beauty and the natural condition of Pendem Village; the saving ranges from IDR 40,000 to IDR 150,000. With that number, the value obtained are about IDR 476,681,000.

4. Intangible Value

The value of the existence and value of inheritance are the value of activities that the government oversees within the efforts of land development. Batu municipal government in an effort to develop agriculture organic in Pendem village has budgeted the funds used in farming development rice organic in Pendem village. Batu city government policy in cooperation system with Sri Mulyo II community are attempting to provide fund allowances to meet the needs farmers in an effort to develop organic rice farming in Pendem village that has been started since year 2014.

Total budget used in the development of rice farm in Pendem village is IDR 250,688,025 in 2014 and IDR 259,575,630 by 2015.

5. Total Economic Value Calculation

The total economic value of Rice Organic farming in Pendem Village can be calculated by this calculation:

\[ \text{TEV} = \text{DUV} + \text{IU} + \text{OV} + \text{EV} + \text{BV} \]

\[ \text{TEV} = (189,780,000+197,410,792+476,681,000) + (259,575,630) \]

\[ \text{TEV} = 863,871,792 + 259,575,630 \]

\[ \text{TEV} = 1,123,447,422 \]

Thus, the total economic value of rice organic farming in Pendem village is as much as Rp. 1,123,447,422.-.

Assessing the subject of agriculture in the concept of Islamic economics in fact this already exists in the verses of the Qur'an among others on Ar-Rahman 10-13 : "And God has levelled the earth for the creature (His). On the earth there are fruits and palm trees that have petals. and the crustened grains and the fragrant flowers. Then which favors of your Lord do you deny?"

In addition, there is the subject on Yasin 33-35 : "And a sign (great power of God) to them is the dead earth. We live the earth and We remove from it grain. Then thereof they eat. And We made him the gardens of dates and of the grapes, and We caused him to sprinkle some springs, that they may eat of their fruits, and from their hands. So why are they ungrateful?". From the above two verses, it appears that agriculture as one of the gifts of God needs to be studied in depth in various aspects one of them in Islamic economics.
Then continue to the discussion on sustainable agriculture development in the concept of maqashid shariah. The objectives of the Shariah essentially reflect the broad and comprehensive understanding of the objectives of the ruling of Shariah revealed for the benefit of mankind [2]. The ruling is revealed from Allah SWT.

The Maqasid Shariah, an Arabic term, is a combination of two words, that is, Maqasid or goals and objectives and Shariah. Maqasid could be defined as the objective, aim or intention while Shariah is the law of Islam. Thus, the objectives of the Shariah is the objective of the implementation of hukm or command [7]. The Maqasid Shariah is translated as the objectives of Shariah [5].

It is considered by Laldin and Furqani [5] as the broad framework governing the financial sphere that provides guidelines and directions to ensure the realization of maslahah or benefit and the prevention of mafsadah or harm in all financial transactions. Laldin and Furqani [5] further clarify that the objectives of Shariah remain theoretical until they are applied and brought into the realm of reality.

The objectives of the Shariah is classified into two main categories, namely the general or Maqasid al-amm, the specific or Maqasid al-khassah. Ashur [1] defined the general objective as the deeper meaning and inner aspects of wisdom by the Lawgiver in all or most of the areas and circumstances of legislation. It is mainly concerned with the public affairs of Muslims and lays out specific rules and laws to regulate civil and social dealings.

It also refers to the attainment of what is good and beneficial, which is maslahah (benefit/interest) and prevention of the evil and harmful that is mafsadah [1]. On the other hand, specific Maqasid or Maqasid al-khassah is an objective of the Shariah which governs a few groups of certain laws such as family laws.

Naim [7] stated that the implementation of an action in a way that is contrary to Islamic law with the excuse of meeting the objectives of Shariah is rejected. It should be highlighted that the ultimate goal is to perform these actions in a manner guided by Islamic law. Therefore, it is important to achieve the objectives of Shariah in a manner that is in accordance with the Islamic law.

According to Dusuki and Bouheraoua [3], Islamic scholars such as Al-Shatibi divided the general objectives of Shariah into three sub categories, which are the daruriyyat or basic needs (necessity), the hajjiyyat or comforts (complementary benefits) and the embellishments or tahsiniyyat (luxuries). Dusuki and Bouheraoua [3] further defined necessity as the elements in life that individuals are dependent upon. Human life would be incomplete if these aspects are not fulfilled. It comprises the fundamental aspects outlined in the objectives of Shariah, which are protection of religion, life, intellect, lineage (honor) and property. The welfare of the individuals and the society at large is established through the preservation of these elements.

Necessity has become a key requirement for human life in this world the hereafter. Complementary benefits refer to those things that are required by humans to provide comfort and harmony in life as well as to avoid hardships that result in trouble and short life span [3]. The absence of this would not disrupt an individual’s life if the aspect of necessity has been fulfilled.

Complementary benefits, in other words, focuses on the desire to restore and improve human life. It also reflects the objective of removing hardships and enhancing an individual’s life. As for embellishment, it is a situation that leads towards betterment in life [4]. It denotes the realization, the realization of which results in improvement and attainment of that which is desirable.

Thus, embellishment includes customs and good manners, keeping clear of filth and bad attitudes as well as performing the recommended practices of workship [4]. However, individuals should not focus only on embellishment as it would lead to undesirable problems in life caused by the neglect of things that are necessity. Nevertheless, it is encouraged to adhere to complementary benefits and embellishment for the proper maintenance of necessity [3].

Then, Imam Al-Ghazali divided and ranked the order of needs as necessities, complementary benefits and embellishment as one of the dimensions under the objectives of the Shariah framework [2]. To realize the benefit, Al-Ghazali argued there are 5 main elements in realizing maslahah commonly known as al-kulliyat al-akhansah is as follows ; Maintaining religion (hifz al din) ; Maintaining the soul (hifz al nafs) ; Maintaining mind (hifz al aql) ; Maintaining descent (hifz al nasl) ; Maintain property (hifz al mal).

Based on some introductions above, there are several findings which the authors found in this research after discussing with Mr. Muji as the head of the Sri Mulyo farmer group who also became the main religious leader at Pendem village especially in the study of sustainable agriculture development in the concept of maqashid syariah whose outline can be seen in this descriptions below.

1. Dharuriyyah

Based on the results of the discussion conducted by the author with Mr. Muji and some members of the SriMulyo farmer group found the understanding that sustainable agricultural development efforts undertaken in the research area can be regarded as a primary thing (dharuriyyah).

That by building organic farming that can be said as a solution of sustainable agriculture development in the long term can be said as an effort to bring out maslahah and avoid mulsadah in the study of al-kulliyat al-akhansah including ; Maintaining religion (hifz al din) ; Maintaining the soul (hifz al nafs) ; Maintaining mind (hifz al aql) ; Maintaining descent (hifz al nasl) ; Maintain property (hifz al mal).
2. Hajiyah

Meanwhile, the second stage of maqashid al-syarī‘ah is hajiyah which is defined as the things needed to realize the ease and eliminate the difficulties that can cause danger and threat if that should exist becomes non-existent. It can be said that the dangers that arise if hajiyah does not exist will not happen to a person and the damage caused does not disturb the common good. Hajiyah is also interpreted with a situation where if a requirement can be fulfilled it will be able to add value (value added) for human life.

As in this study and based on the results of discussions conducted by the authors with some respondents there are some things that can be categorized as this hajiyah such as maintenance of water resources from drought and land damage that often occur due to conventional agricultural applications so far.

3. Tahsiniyah

The final stage of maqashid al-shariah is tahsiniyah, which can be interpreted as doing good habits and avoiding what is bad according to what is common sense. As in this study and based on the results of discussions conducted by the authors with some respondents research of several things such as frequent counseling and training conducted by the government associated with the program development of sustainable agriculture can be categorized as a tahsiniyah.

IV. CONCLUSION

Islamic economy as a way of life lately began to be studied and applied in various aspects. However, on the other hand, there is still a vacuum in which the study on Islamic economics is now more focused on the study of business, finance, and banking. While the broad outline of basic economic problems that comes from the fulfillment of needs and desires with all the implications on the long term or often referred to as sustainable development in the concept of Islamic economics is still minimal discussion. Where in this journal the authors will raise about the issue of sustainable development with the focus of studies in the farming sector which is basically much studied in the Quran about the God given agricultural blessing and human task as khalifah to preserve it.

Where the research area conducted found total economic value of Rp 1,123,447,422 consisting of direct benefit value, indirect benefit value, choice value, and value of existence on sustainable agriculture development efforts in one village where the research is conducted with some other derivative benefits of dharuriyah, hajiyah, and tahsiniyah that can be studied in the concept of maqashid al-syarīah.

REFERENCES