



Integrated Agricultural Circular Economy Edutourism Model (Case Study on Edutourism in Pancasan Village, Ajabarang District)

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Abstract. *This research is entitled: Integrated Agricultural Circular Economy Edutourism Model in Pancasan Village, Ajibarang District. The aim of this research is to develop an integrated Circular Economy Agricultural Edutourism Model in Pancasan Village, Ajibarang District. The form of Integrated Agricultural Circular Economy activities in Pancasan Village, Ajibarang District is carried out by utilizing inorganic waste to be processed into maggot or cashgot which is then used to increase fishery, livestock and agricultural production. Tourist objects and attractions that will be developed include waste processing activities, meter fisheries and fast water fisheries cultivation. Integrated Agricultural Circular Economy activities in Pancasan Village, Ajibarang District are managed by BUMDES Berkah Banyu Makmur. This research was carried out using a qualitative approach with a case study method, the population and informants in this research were all tourism stakeholders in Pancasan Village, the data collection method used data reduction methods, data description and data categories. Based on the data collected, an Integrated Agricultural Circular Economy Edutourism Model was prepared in Pancasan Village, Ajibarang District. The resulting Edutourism Model refers to the Hexa-Helix Model of stakeholder involvement in the Edutourism Development program.*

Keywords: Circular Economy, Integrated Agriculture, BUMDES, Hexa-Helix model, edutourism

1. Introduction

The regional autonomy policy gives regions the authority to manage and regulate the needs of their regional communities in order to increase village income. The Pancasan Village Government implemented this policy by forming BUMDes Berkah Banyu Makmur in 2016 with the vision of realizing the welfare of the people of Pancasan Village through utilizing the village's potential. The business units managed by BUMDes are waste management, fisheries, agriculture and swimming pools. In Pancasan village there are also 10 farmer, livestock and fish groups that carry out integrated agricultural businesses. Pancasan Village is also a center for the roof tile industry. In this village there are 700 households that produce roof tiles. Currently, BUMDES has 1 tourist attraction in the form of a swimming pool which is always busy with visitors.

The Waste Management Business Unit "Berkah Runtah" and the Fisheries Business Unit "Mina Sehat" are business units of BUMDes Berkah Banyu Makmur which were established in 2021. The Waste Management Business Unit was established with the aim of creating a healthy, clean and comfortable environment to live in. Good environmental management will be able to provide pleasure, freshness, coolness, beauty, economic benefits for maintaining health, reducing pollution and maintaining cleanliness (Dijan et al, 2018)¹. At the start of the activity, rubbish was taken from residents and thrown into the landfill. The amount of waste transported from residents per day is 5-6 cubic meters, originating from 40 RTs in Pancasan Village. Only one neighborhood unit has not been transported due to inadequate road access.

BUMDes considers that waste in the landfill will continue to increase and one day it will become a problem. Therefore, BUMDes strives to ensure that existing waste can be processed into products with economic value. The waste is then processed into organic slurry. From 5-6 cubic meters of waste per day, 150 kg of organic waste slurry can be produced. The waste slurry is then used to feed



the maggots. From the results of this waste management, BUMDes Berkah Banyu Makmur Pancasan can harvest 40 kg of maggot per day and produce 75 kg of compost (kasgot) per day by empowering 6 Pancasan residents with wages that meet UMR standards.

Maggots are organisms that originate from fly eggs, in the second phase of metamorphosis after the egg phase and before the pupa phase which then turns into an adult fly (Tomberlin et al., 2009)². Maggots can convert organic material into biomass. The advantage of maggots is that they can be produced in various sizes, according to needs (Fahmi et al., 2009)³. Apart from that, maggots contain quite high protein, ranging from 30-45%, so they can be used as a source of protein. Another advantage that maggots have is that they contain anti-microbial and anti-fungal properties, so that when consumed by fish it will increase the body's resistance to attacks by bacterial and fungal diseases. One way to cultivate Black Soldier fly (BSF) larvae is by using an alternative way of handling organic waste. This is confirmed by Duponte (2003)⁴ who stated that organic material is a suitable medium for larval growth.

BSF Magot is used to support agricultural, livestock and fisheries activities in Pancasan Village. Currently, maggot produced by BUMDes is used for fish feed from 8 fish ponds and chickens owned by BUMDes, while the cashgot produced is used as agricultural fertilizer from rice fields owned by BUMDes. BUMDes management is also working to increase maggot production so that the results can also be used for feed from 143 fish ponds owned by residents, rice fields and various livestock businesses owned by residents, especially 10 farmer, livestock and fish groups in the village.

The existence of various businesses managed by BUMDes and the dynamism of residents in economic activities have given rise to the management's desire to make Pancasan Village an educational tourism destination. The Edutourism destination that will be built involves BUMDes and the entire Pancasan village community, especially 10 farmer and livestock groups in the Integrated Agricultural Circular Economy activities. These activities start from managing household waste, producing waste into Black Soldier Fly (BSF) maggots and using maggots to support agricultural, livestock and fisheries activities. Therefore, the village Eduwisata model that will be developed is the Integrated Agricultural Circular Economy Edutourism Development Model.

There are many things that tourists can learn from this village. Firstly, integrated agricultural businesses have great potential to be developed as educational tourism objects. This allows tourists to learn about waste management, maggot cultivation, carcass making, fish cultivation, agriculture and animal husbandry. As support, fishing and culinary tourism attractions will also be developed. BUMDes and 10 farming, livestock and fisheries groups in Pancasan Ajibarang Village will be the objects of tourism being developed. The realization of Pancasan village as an Integrated Agricultural Circular Economy Edutourism will be able to increase people's income and reduce unemployment by 337 people in Pancasan Village. BUMDes and the Pancasan Village Government really need the help of science and technology to be able to realize Pancasan Village edutourism. Therefore, the village really hopes for assistance from UNSOED so that it can build community-based education that is attractive and tested based on research results.

Community-based edutourism development requires solid collaboration between stakeholders. Strengthening community capacity as tourism human resources also needs to be built. It is necessary to synchronize the involvement of BUMDes and the community in developing Integrated Agricultural Circular Economy Edutourism considering that the potential for Edutourism lies in BUMDes and the 10 integrated agricultural groups in Pancasan Village. Apart from that, developing Edutourism also requires technological support to market and build public awareness of the existence of Edutourism and build the image of tourist destinations developed by the community.

Therefore, it is necessary to develop a Model for the development of Integrated Agricultural Circular Economy Edutourism in Pancasan Village, Ajibarang District. The model is used to help clarify community-based edutourism management procedures, create relationships and the overall situation of what is designed in the development of community-based edutourism. Research on analysis of community readiness (Weni et al, 2012)⁵ and analysis of community competence (Weni et al, 2013)⁶ in tourism development, analysis of consumer knowledge and risk perceptions regarding interest in visiting tourist destinations in the new normal period, with an attitude of avoidance towards risk as a mediating variable (Weni et al, 2021)⁷ as well as the model for developing batik villages as tourist destinations using a Public Private Partnership approach (Weni et al, 2014)⁸ that researchers have



carried out can be a provision for conducting this research.

2. Research Methodology

At the data collection stage in this Integrated Agricultural Circular Economy education research, researchers used several techniques to obtain relevant and comprehensive information. The following is a narrative about data collection techniques, data processing methods, data presentation methods, data quality testing, and analysis techniques used in this research: In an effort to gain a deep understanding of Integrated Agricultural Circular Economy education, this research applies several diverse data collection techniques. First of all, researchers conducted a literature study to detail previous findings, both from previous research, policies, legislation, and other supporting information that could provide insight into the context of Integrated Agricultural Circular Economy education. Apart from that, primary data was also collected through interviews and FGD (Focus Group Discussion) with experts and related stakeholders. This technique provides an opportunity to gain direct views, insights and perspectives from those who are in the field or have expertise in the field.

Secondary data collection was carried out by studying various documents, such as written event reports, administrative documents, official announcements, articles in the mass media, and other written documents relevant to Integrated Agricultural Circular Economy education. After the data is collected, the next step is data processing. The collected data will be processed using data reduction methods, data description and data categories. Data categorization is carried out based on the comparative analysis method, with each category being a pile based on thoughts, intuition, opinions or certain criteria.

The data that has been processed is then presented in the form of narrative text that is systematic, logical and rational, according to the order or position of importance of the data. Apart from that, the data is also presented in matrix form, namely in the form of a table containing descriptions of words from interviews and observations. To ensure data quality, this research applies a data quality test. Data quality testing is carried out through source triangulation, namely by comparing and checking the degree of trustworthiness of information from different times and tools in qualitative methods. Apart from that, method triangulation was also carried out, namely checking the degree of confidence in research findings with several data sources using the same method. Finally, in the data analysis stage, this research uses qualitative analysis methods, with an emphasis on comparative analysis models and data interpretation. Through this approach, it is hoped that this research will be able to make a significant contribution to the understanding and development of Integrated Agricultural Circular Economy education.

3. Results and Discussions

3.1. General description of Pancasan Village Development

3.1.1 Description of the Eduwisata Village

Based on Central Java Provincial Regulation Number 6 of 2021 concerning the Empowerment of Tourism Villages, a tourism village is a form of integration between the potential for natural tourist attractions, cultural tourism and man-made tourism in one particular area supported by attractions, accommodation and facilities. others according to the local wisdom of the community.

Tourism villages have an important role in advancing community welfare, equalizing business opportunities and employment opportunities, optimizing economic potential and regional characteristics, as well as promoting and protecting cultural values, religion, customs and preserving nature..

There are three categories of tourist villages according to development which serve as references for further development. According to Dyana Gea et al. (2022)⁹ is as follows.

- a. Pioneer Tourism Village is a tourist village that still has potential. The facilities and infrastructure of this tourist village are still limited.
- b. Developing Tourism Village, is a tourist village that has adequate and developed facilities and infrastructure. Tourist villages in this category have been visited by tourists from outside the area.



- c. Maju Tourism Village, is a tourist village whose people are aware of the tourism potential which is categorized as a tourist village that is able to utilize village funds for the development of tourist villages.

According to its development classification, Pancasan Village edutourism is included in the pioneer tourism village category. This is because currently Pancasan Village is still quite limited in terms of facilities and infrastructure. However, it is currently in the development stage which is being carried out seriously by BUMDes and the Pancasan Village Government.

3.1.2. Potential of Pancasan Village

Pancasan Village is one of the villages in Ajibarang District, Banyumas Regency which is currently developing its village into a tourist village with the concept of educational tourism. Pancasan Village is known as a village rich in water resources. This is because Pancasan Village has a spring that continuously flows and never recedes even during the dry season. With the potential of this water resource, BUMDes and the Pancasan Village community use it for swimming pools, cultivating freshwater fish and for agriculture. BUMDes Pancasan has several businesses which are the result of utilizing the potential of Pancasan Village, including waste processing, fisheries and agriculture.

a. Waste Processing

The main aim of establishing this waste processing plant is to protect water sources from waste. Then it is supported by Regional Regulations regarding waste, which states that the waste problems of each village must be resolved in the village itself. For this reason, BUMDes Pancasan processes organic waste which is later processed into maggot and cashgot.

b. Fishery

Fisheries in Pancasan Village are divided into 2 objects, namely freshwater fish cultivation and the Kali Pagak dam. Currently the object that is underway is freshwater fish cultivation. In the process of cultivating freshwater fish, maggots are used as fish food. Thus forming the concept of a circular economy. The Kali Pagak dam object is not yet underway, but will be realized in the near future.

c. Agriculture

The type of plant cultivated is kale. This village is synonymous with kale plants, because the typical kale from Pancasan Village is different from kale in general in terms of texture and taste. This is because the soil is sandy and muddy and the water contains high levels of oxygen. Currently, kale farming is still in the process of developing into mina kale. For this reason, agricultural land will be integrated with fish cultivation ponds in one land. So it will form an integrated agricultural concept.

3.2. Pancasan Village Tourism Development

Efforts to develop tourism in Pancasan Village have actually been initiated since 2019. The vision of Pancasan Village is to create an independent village through education-based village tourism. The mission of Pancasan Village is 1) Making Pancasan village a tourist village with an agricultural and fisheries base; 2) Building MSMEs based on agriculture, fisheries and animal husbandry through startups and information technology; 3) Develop cultural, agricultural, fisheries, animal husbandry and information technology experiential tourism; 4) Exploring, preserving and developing local cultural and artistic values in supporting tourist villages; 5) Arrangement of village environmental areas using the zero waste principle; 6) Increasing accessibility to support tourist villages; 7) Empowerment of local communities as fish hatchery centers in creating tourist villages.

The planning for Pancasan Village to become an Edutourism Village has gone through careful planning involving the Banyumas Regency Dinporabudpar. The following image shows the Spatial Planning Map for Pancasan Village, Ajibarang District, Banyumas Regency. There are 6 potential tourist attractions that will be developed in Pancasan Village, namely : 1) Garbage



Hangar; 2) Educational Tourism on Roof Tiles Making; 3) Educational tour of tilapia hatching and rearing; 4) Deras Kalipagak water tourism; 4) Mina Kangkung Edutourism; 5) Organic Farming Edutourism; 6) Edutourism Fish market.

The background to the establishment of this waste processing unit is that apart from creating a healthy, clean and comfortable environment to live in, it also tries to manage waste by turning it into goods that have high economic value. Currently the Pancasan Village waste processing unit is managed by the Village-Owned Enterprise (BUMDesa) Berkah Banyu Makmur. Waste at the Pancasan Waste Processing Unit is managed by turning organic waste into slurry which is then used to produce BSF maggots. The problems faced are: Magot production results are not optimal. This is due to the limited area and suitability of cages for the production of magot flies. Magot harvesting equipment is still conventional, which makes harvesting time longer and cannot harvest in large quantities.

Limited competent Human Resources (HR). The waste is chopped and processed into organic slurry. from 5-6 cubic meters of waste per day produces 150 kg of organic waste slurry. Garbage slurry is used to feed maggots. The magot harvest per day can reach 40 kg and produce 75 kg of compost. The magot produced is used as a basic ingredient for making fish food. Kasgot (the remains of magot digestion) is used as an ingredient for making organic fertilizer. Meanwhile, inorganic waste (plastic and the like) will be processed into distilled oil which can be used as a lubricant for roof tile presses by roof tile craftsmen in Pancasan Village. It is no less important to build a waste processing unit in Pancasan Village to protect existing water sources.

The roof tile craft industry is productive activities carried out most of the residents of Pancasan Village by changing the raw clay material become tile. The business of making earthen roof tiles is a hereditary business. Pancasan roof tiles have been around since 1943. To date, there are approximately 700 families who own roof tile manufacturing businesses. In the edutourism development plan, namely by prepare a group of roof tile craftsmen who will serving tourists to learn and practice manufacturing roof tiles from start to finish.

Kali Pagak is a river created from a spring and is located in Tanah Kas Desa which is directly connected to the Taman Tirta Alami Pancasan Swimming Pool. Kali Pagak used to be a river that was quite dirty and poorly maintained. There is quite a lot of rubbish and it is covered in dense water hyacinth plants. During its development, the Pagak River is planned to be used as a place for cultivating fast water fish.

Apart from that, the use of the Kali Pagak River flow is also a place for education about fish cultivation and knowledge about local fish species in the Kali Pagak River as well as education about environmental conservation. Another attraction is that tourists are given the opportunity to feed the fish and go on a culinary tour of processed fish. Judging from its location, Kali Pagak is directly connected to the Ki Sela Brani Site. So, this is used to educate about the history of the origins of Pancasa Village

The development of Mina Kangkung education tourism was inspired by the success of Mina Padi Sanberembe tourism, Sleman Regency. Eduwisata Mina Kangkung Pancasan Village is located on the Village Cash Land which is managed by an agricultural group as water kale farming land from the time of our ancestors. Water spinach is a superior plant in Pancasan Village. Water spinach from Pancasan Village is known to be delicious and is a business passed down from generation to generation by the residents of Pancasan Village.

Mina Kangkung Tourism offers learning attractions about agriculture and fisheries of Mina Kangkung. In future development, a fish market will also be built as a sales center for residents' fishery products and the mina kale fishery, as well as a culinary center for processed fish products and kale farming. This edutourism is also connected to the Datar River which will become a river tubing tour which will add to the tourist attraction.



- 3.2.1 Sectoral approach in developing tourism in Pancasan Village
Develop commodities and productive businesses by optimizing the role of BUMDES as a locomotive for village economic development. Positioning the village government as an entrepreneurial government, namely a village government that focuses its energy not only on spending money (making budget expenditures), but also on earning it (getting business results).
- 3.2.2 Spatial approach (spatial planning) as a basis/reference for the direction of village development. Sectoral approach (bumdes) to develop the village economy so that it becomes an independent village. HR approach to strengthen the capacity of village government and community in managing village potential. Information and communication technology (tik) approach to improve service quality, transparency and accountability.

3.3. Integrated Agricultural Circular Economy Edutourism Model in Pancasan Village, Ajibarang District.

The development of tourism through tourist villages is one of the efforts that is being intensively carried out by the government to support economic growth both nationally and regionally. A tourist village is a form of unity between accommodation, attractions, tourism supporting facilities and infrastructure presented in a community life structure that is integrated with tradition. It is hoped that the development of tourist villages can increase community productivity to advance the economy and welfare of the village.

The development of tourist villages can have positive impacts such as increasing employment opportunities which can reduce unemployment, increasing economic growth, maintaining the preservation of nature, resources and culture, creating adequate infrastructure, and others. In practice, developing a tourist village is not easy, because there are several challenges that can hinder it. One of the challenges that is often encountered is the difficulty of villages in maintaining the continuity of their tourism so that it remains sustainable and capitalized. Therefore, developing tourist villages requires good coordination between stakeholders, local government, universities, society, regulations, the private sector/business world and the media.

The tourism management model that will be used in developing tourism in Pancasan Ajibarang Village is the Hexa-Helix Model. Hexa-Helix stakeholder involvement in the Edutourism Development program for Pancasan Village, Ajibarang District can be explained as follows:

- a. Government
 - 1) Provide major contributions in the formation of regulations and policies related to the growth of rural tourism. responsible for the allocation of funds and resources necessary to develop the program;
 - 2) The Pancasan Village Government along with the Pancasan Bumdes are the driving force in this tourism activity. Good, transparent and accountable governance is the motto of this village which will lead to the success of Pancasan Village tourism. Planning and all concepts are made by all components of society, especially BUMDES with the direction of the Village Head.
- b. College
 - 1) Provide the latest knowledge and research that can assist in creating an effective tourism education curriculum;
 - 2) Can provide training and education to local communities related to the tourism industry and natural resource management.
- c. Public
 - 1) They are the main stakeholders because they are directly involved in this development; 2) It is possible to create a truly original educational experience by providing valuable contributions, such as local knowledge and traditions. In Pancasan Village, the community is very enthusiastic in helping develop Pancasan Village Edutourism. There are 10 business groups in this village. The community actively carries out community service at the locations of the objects to be developed.
- d. Media



1) contribute to promoting this program to the general public; 2) Through articles, coverage or special programs in the mass media, you can help promote the attractiveness of Pancasan village. Many media have covered interesting objects in Pancasan Village. The charm of Pancasan Village can be seen via YouTube, IG, FB, Twitter and other social media as shown in the following picture.

e. Business world

1) Participate in investment and business opportunities related to village education tourism development; 2) It can create jobs and provide training to local people.

f. Regulations

1) provide a legal and regulatory framework to regulate the tourism industry and environmental conservation; 2) ensuring that this development is carried out in accordance with sustainability and safety standards; 3) The Pancasan Village Government has made a Village Regulation on the Establishment of BUMDesa with Pancasan Village Regulation No. 05/2021, establishing Pokdarwis with SK No. 141/029/2023 and Karangtaruna Decree with SK No. 141/20/2023. All regulations are attached to this study.

4. Conclusion

Tourism development in Pancasan Village, Ajibarang District uses the Hexa-helix model, which is a model that involves good coordination and cooperation between stakeholders, local government, universities, society, regulations, the private sector/business world and the media. Tourism development in Pancasan Village already has a clear model and direction, therefore assistance from various parties including UNSOED is very necessary so it is recommended that UNSOED can continue to be involved and oversee the success of Pancasan Village Edutourism which will be very good for UNSOED branding and become a venue for the UNSOED academic community. to be able to apply their knowledge and provide benefits to the local community.

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