

# The Strategy of Organic Farming Implementation through Waste Bio-Conversion in Developing Baran Edu-Tourism Kampung, Malang, Indonesia

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**Abstract** To increase the economic resilience due to the Covid-19 pandemic and raise the environmental quality, it is important to conduct a community-based development program based on an integrated strategy. This study aimed to formulate *Kampung Baran Edu-tourism* strategies, *Kampung Baran* was one of Madura Pedalungan's urban-periphery settlements in Malang City. First, the (local) characteristics based on terraphilia paradigms were identified. The characteristics contain local potentials and their problems. At the second stage, we used SWOT analysis to identify the strengths, weaknesses, opportunities, and threats and formulate strategies to develop Baran edu-tourism. The organic Integrated Farming concept was chosen as the development model. It started from organic-fertilizer production through organic waste bio-conversion (we chose vermicompost and liquid organic fertilizer). The implementation of organic-waste bio-conversion should be conducted through mentoring, counseling, innovators coaching, and FGDs to enrich local people's knowledge about modern organic farming, and strengthen social participation, socio-economic institutions, and networks.

**Keywords** Organic Farming, Waste Bio-Conversion, Edu-Tourism, Organic Fertilizer

## 1. Introduction

During the Covid-19 pandemic that hit Indonesia in 2020-2021, many sectors of economic activities have declined. It at the same time had caused negative impacts on the economic activities of Malang City people. *Kampung Baran* was located in Buring, Malang, East Java. It is 90% occupied by Maduresse Pedalungan (overseas Madurese descent). Most Baran people experienced the negative impact of the Covid-19 pandemic. With most of the population being in the lower middle class economic, the economic activities decline has become a burden for them.

The Shining Baran Fruit Edutourism *Kampung Program (Kampung Edu-wisata Buah Baran Bercahaya - KEBBB)* aimed to increase and develop ecological-themed in economic and tourism activities. This theme seems to be a trending theme in urban lifestyle [1]. On the other hand, the theme also helped improve the urban-environmental quality and increase people's health. The urban society needs a green environment and scenery to relieve their stress in their leisure time. They also need some organic healthy food to increase their immune [2].

The Living Planet Report (LPR) of 2014 stated that in 2010 Indonesia was among the top ten countries that account for more than 60% of the Earth's total biocapacity.

The Ecological Foot Print in Indonesia fell shut of the world's average (1.7 gha) biocapacity per person [3]. There was a bidirectional causality relationship between emissions with economic growth, emissions with the agricultural sector, emissions with the manufacturing sector, economic growth with the agricultural sector, and economic growth with manufacturing. There was a need for Indonesians to relieve environmental pressure by propagated sustainable development in all fields [4].

The environmental crisis and damage problem have raised the idea of sustainability with three main pillars: economic, environmental, and social [5, 6] From the sustainability paradigm, new concepts emerged with the principle of 'reconnecting' the elements that exist in the universe, including interdisciplinary concepts, such as the integrated farming, urban farming, and organic farming concept [7, 8], the green design, eco-culture, and socio-ecological concepts [9, 10]. In principle, what is done is to take advantage of the potential or whatever is around to meet the needs, at least local needs. The management technique can be reduced, reuse, and recycle. This process requires the help of the application of science and technology. Its application on a regional scale requires the involvement of all parties.

The research aimed to formulate appropriate strategies based on local potential. The *kampung* development activities as tourist destinations should not conflict with the socio-cultural life and its ecosystems that have been running previously [11, 12]. Identification of potentials and problems by an adequate approach could help formulate appropriate strategies.

## 2. Materials and Methods

The field observation was carried out using the terraphilia paradigm or territorial identity [13, 14]. The terraphilia model accommodates possible changes due to globalization, without losing their local identity [15]. By this paradigm, the research would assess and measure the potentials and problems, and thus formulate the strategies for developing Kampung Baran Edu-tourism.

The researcher conducted this research in three stages. At the first stage, we collected data and classified it into objective and subjective aspects of terraphilia. The objective aspect combined fixed (static) and moving (dynamic) spatial elements, pictures of facts about the landscape and lifestyle interrelation. The subjective territorial identity was assessed through activities and views or thoughts. Data were collected by field observation, forum group discussion, and interview.

The researchers observed the natural physical elements and recorded them in photographs, videos, and sketches. Secondary data were collected from the district office. Forum group discussions and in-depth interviews were conducted to gather the socio-cultural data that related to the studies, activities, and lifestyles. Unlike Oliveira that

used Identerra Model in his research [13], the methods used in identifying the terraphilia (territorial identity) in this research were a more practical approach, as it involved a smaller area, fewer people, and only one dominant ethnic. The FGD was conducted not more than six times during the research. People were asked to describe their *kampung* by pictures and sketches and stories. The researchers recorded the oral description and transliterated it the same as they were said. This method was used by Azmi & Ali [16], Duxburry [17], and Fretas [18] to make a cultural mapping.

The data further was described according to the elements in each aspect. By focusing observations on the distinctive, unique, and important one contained in each element, the characteristics of the Baran village, both natural-physical aspects and social-activities aspects, were identified.

At the second stage, we conducted the SWOT analysis. The analysis included two main components, namely internal components (strengths and weaknesses) and external components (opportunities and threats) [19, 20]. SWOT analysis is used to analyze strategic factors of the tourism [21], [22]. Rehanian et al [22] used SWOT analysis for studying sustainable tourism in Boujagh National Park of Iran. They used the SWOT matrix and proposed some strategies for the sustainable growth of the tourism industry. Other researchers used the SWOT model to assess tourism industry development in other countries to propose the development strategies [21, 23-26]. Different from other studies, this research combined the two methods: firstly, identified local characteristic-based on two basic aspects of terraphilia (objective/natural-physical landscape aspects and subjective/ social-activities aspects), and used SWOT analysis to assess the strengths, weaknesses, opportunities, and threats. The variables observed in the SWOT analysis include aspects of the natural-physical landscape and social activities. The aspects were classified into internal and external strategic factors according to the assessment of respondents obtained from questionnaires.

In observing social activities aspects, we distributed questionnaires to as many as 20 respondents, selected purposively consisting of community leaders, outsiders, and academics involved in the *Kampung* Baran edu-tourism development program. Respondents' ratings for each variable were 1-4 (very weak to very strong). From the sums of the respondents' assessments, we determined the average value. If the value was above 2.5, it would be classified as a positive factor (strength or opportunity). If the value were less than 2.5, it would be classified as a negative factor (weakness or threat). If the positive factor were the internal factor, then it would be classified as a strength, and if it were the external factor, it would be classified as an opportunity. If the negative factor were an internal one then it would be classified as a weakness and if it were an external factor, it would be classified as a threat.

Furthermore, the weight of internal factors (IFAS) and

external factors (EFAS) was determined depending on their importance. It was determined by FGD consisted of the Baran Edu-tourism development team and leaders. The total number of maximum weight values was one (1) both for IFAS (total sums of strength and weakness factors) and EFAS (total sums of opportunity and threat factors). IFAS was Internal Factor Analysis Summary by weighting and rating strengths and weaknesses so that we could determine the total score of strengths and weaknesses. EFAS was External Factor Analysis Summary by weighing and rating opportunities and threats. In the next stage, the calculation of the coordinates on the SWOT diagram was determined. The position of the coordinate points was then interpreted to determine the strategy for developing edu-tourism in Kampung Baran.

At the last stage, the researchers formulate the strategies for development. From the SWOT analysis results, the strength, weaknesses, opportunities, and threats were mapped in SWOT diagrams and matrix. The strategies for developing *Kampung Baran Edu-tourism* were formulated based on the results of SWOT diagrams and matrix analyses.

### 3. Results and Discussion

From the results of observations and field research, the data are grouped into two categories of basic aspects of terraphilia as follows:

**Table 1.** Territorial Characteristics Based on Physical-Natural and Socio-Activity Aspects

Elements	Territorial Characteristics
<i>Natural-Physical Aspects</i>	
Natural systems and features	The land was fertile
	Clean water was difficult (dry land) so agricultural activities relied on rainwater; there was already PDAM water managed by HIPAM for daily needs
	93% green land, Baran had rural, fresh, and green panorama
Topography	Geomorphologically the Buring dome included young stadia with 3 forms of relief: 15% flat-weave, 35% undulating, and 50% hilly-mountainous; altitude +440dpl
Vegetation	There were some perennials (pine, sengon, fruit trees, bamboo), secondary crops, <i>empon-empon</i> (turmeric and ginger), sugar cane, cassava, corn, horticulture, chili
	Types of fruit trees: jackfruit, durian, orange, banana
	Grass for fodder (cows)
Land use and cluster	Group settlements had roots in the <i>taneyan lanjheng</i> system, but have undergone 75% physical transformation
	The farms were near the houses or at the outside of the settlement (most of them have been sold to the outsiders, leaving only the front or back-yard of the house)
	Mosques and <i>langgar</i> were found in several <i>taneyan-lanjheng</i> clusters
	According to Malang City Planning, the government planned to develop Kampung Baran as a green area and agriculture. Kedungkandang District was the largest green area in Malang City, that has not been developed for city tourism facilities yet.
Circulation	Infrastructure: asphalt road with potholes about 2.5 meters wide
	Traditional settlement patterns ( <i>taneyan lanjheng</i> ) are based on kinship relationships ( <i>taretan</i> ) and formed an open circulation between houses.
Tourism infrastructure	Lack of thematic facilities for edu-tourism, such as food stalls, educational facilities, parking area, family-gathering facilities, path-ways for walking around the village comfortably, etc.
Architectural style	The <i>gedheg</i> (bamboo) and wooden houses had decreased a lot in the last 10 years because of the House Renovation program by the Mayor of Malang
	Unique architectural style (Maduresse traditional houses)
	The new houses build on a new architectural trend
Cultural and Economic Heritage	Religious culture and <i>Kyai</i> as the leader, symbolized by the ancestor's tomb (KH Malik Dalam)
	Farmers were the hereditary economic activity
	Local cultural performance: <i>jaran kepang</i> , <i>macopat</i> , <i>tandhak</i> , <i>sronen</i> , <i>sandhur</i> , <i>topeng Madura</i>

Table 1. Continued

<i>Social-Activities Aspects</i>	
Language	Madurese, Javanese <i>ngoko</i> ; the Indonesian language is spoken by the younger generation, the elder cannot speak Indonesian fluently
Religion and Ethnic Social Life	95% moslem ; Madurese descent ( <i>madura pendalungan</i> )
	Mutual activities were bounded by religious spirits such as <i>Jamaah Tahlil, Jamaah Diba, and Jamaah Istighosah,</i>
	<i>Kyai, ustadz</i> as the leader
	No social-formal organization as in other districts (PKK)
	Full-day workers: Monday-Sunday for sugar-cane field labors (05.00-15.00), and Monday-Saturday for industry laborers (08.00-16.00)
	Hard for mutual-work ( <i>kerja bakti</i> )
Education	Easy in social-giving and helping such as <i>Biyada</i>
	Lower education: most people (50%) did not graduate from Elementary School (SD/madrasah/Pondok pesantren)
	Most of them work as labor in the sugar-cane field, cigarette industry, and construction
	Farmer (has their farm and livestock: cattle, goats, chicken, duck): 0,2%. They managed their lands by a conventional method
Economy	Other: Pedler, <i>online</i> seller, teacher/civil servants
	Most families were in the lower economic group, some of them were below the poverty line
	They sold almost 90% of their farm to outsiders. Baran people had only their yard, they worked on other's land
	Some people also worked as row farmers with an average income under 1.000.000/month

By analyzing the description above, the characteristics of *Kampung Baran* were:

- a Baran had big potential in agriculture, but the people were not supported well either the modern agriculture system, economic and educational aspects. They tended to sell their land and work as labor, so they could get a clear income compared to farming
- b Baran had a green and fresh panorama with clear air and hilly topography.
- c Baran was locaear from the heart of Malang City. According to the Malang City planning, Baran would be devel as a green open area and tourism destination
- d Baran had a unique culture, formed by its history and ethnic characteristics that is Madurese descent. Most people use the Madurese language, but many of them cannot speak Indonesian.
- e As its basic ethnic characteristics, Baran people were very religious; they obeyed and respected *kyai* as their leader.
- f The mutual activities are colored by the Islamic religion, for example, *jamaah tahlil, diba', istighosah*, recitation, and routine religious lectures

in mosques, people's houses, and *Pondok pesantren*. They did not conduct a social-formal organization - PKK (Family Welfare Empowerment) as in other districts.

- g Baran had some traditional houses and traditional performances.
- h Natural and local building materials were still available.
- i Most Baran people were at lower education levels.
- j Most Baran'sran people were not open-minded. They were hard enough in receiving new knowledge and technology. They preferred to be an employee with a clear salary, although it is very low than to be a farmer with no clear income.
- k Baran was located in a periphery area. It was easy-accessible, but the infrastructure conditions were not adequate as tourism facilities.
- l There were only a few facilities for Edu-tourism, and in inadequate condition for tourism.

The characteristics of *Kampung Baran* above were further classified as strength, weakness, opportunity, and threat factors.

**Table 2.** Internal Factor Analysis (IFAS)

No	Internal Factors	Score (S)	Weight (W)	S x W
<i>Strength</i>				
1	The fertile of the land for agricultural purposes	2,8	0,11	0,308
2	Green area	3,7	0,095	0,3515
3	Hilly topography and panorama	3,7	0,095	0,3515
4	Plant variation for edutourism and building construction	3,2	0,075	0,24
5	Unique cultural tradition and architecture	3,8	0,120	0,456
6	Social activities and social-bonding	2,8	0,080	0,224
				1,9310
<i>Weakness</i>				
1	Water resources	1,8	0,10	0,18
2	The ability to speak in Indonesia the Javanese Language	1,5	0,06	0,09
3	Social organization (PKK, Dasawisma) an as a tool to convey information and increase social participation	1,8	0,06	0,108
4	Ease of accessibility; adequate facilities and infrastructure	1,8	0,06	0,108
5	Level of formal education and open-mindedness	1,4	0,090	0,126
6	Leadership and participation in conducting edu-tourism	2,0	0,055	0,11
			1,00	0,722
	S-W			1,209

**Table 3.** External Factor Analysis (EFAS)

No	Internal Factors	Score (S)	Weight (W)	S x W
<i>Opportunity</i>				
1	The urban needs for green-tourism	3,5	0,090	0,315
2	The need for healthy living through the availability of organic food	3,2	0,11	0,352
3	The need for increasing organic-farming knowledge, especially for children / elementary school students	2,8	0,070	0,196
4	Strategic location: at the urban periphery	3,8	0,08	0,304
5	No similar tourist destinations in the area	2,8	0,07	0,196
6	New urban lifestyle (loving the rustic theme in a location not far from home to enjoy their leisure time)	3,5	0,11	0,385
				1,748
<i>Threat</i>				
1	The infrastructure condition	1,5	0,09	0,135
2	Land ownership	1,2	0,06	0,048
3	The social participation in succeeding edu-tourism	1,7	0,060	0,102
4	The low level of education makes people move to the urban lifestyle from their agricultural lifestyle	2,0	0,11	0,22
5	The environmental security from theft	2,0	0,08	0,16
6	government support for edutourism development	2,3	0,09	0,207
			1,00	0,872
	O-T			0,876

From the SWOT diagram, it was known that the SWOT coordinates (S-W for the X-axis and O-T for the Y-axis)

were in quadrant I (1,249 and 0.876). This showed a very favorable situation for the development of *Kampung Baran*

edu-tourism because of the opportunities and internal strengths. Through the SWOT matrix, the following analysis was carried out. From the SWOT analysis, we identified the strengths, weaknesses, opportunities, and threats. The score showed that Baran had some weaknesses and threats, especially in the increasing changes in land-use and land ownership, infrastructure, and human resources (education and poverty), and their time as full-day labor. Baran also had strengths and opportunities to be developed. Agriculture was the potential strength and it was by the government planning.

The agricultural character was Kampung Baran’s very potential. It had to be the basis of tourism development. Education and tourism (Edu-tourism) became the business theme to wider the market. Kampung Baran would become the education and tourism destination for families, students (from kindergarten to college), social communities, and so on. This would also become the strategy for educating society to relieve environmental pressure by propagating sustainable development in the field of tourism development [4]. The bidirectional causality relationship between emissions with economic growth, emissions with

the agricultural sector, and economic growth with the agricultural sector would be more balanced [3].

This unique theme would be arising from integrated-organic farming. It was by the increase of people’s awareness of healthy food and life [27, 28]. According to Khorniawati, the number of organic farmers needs to be increased in line with the increasing demand for healthy and organic food [28]. Organic-integrated farming as the edu-tourism theme of the Kampung Baran development program could increase the production of healthy and organic food. Organic food was more expensive than non-organic food. With an integrated agricultural management strategy, Baran farmers’ production could be sold at a higher price and lower production costs

The most important principle of integrated organic farming was to maintain all the local potentials efficiently, producing organic agricultural products sustainably [7, 29]. The ecosystem balancing must be highlighted [5]. Reducing the pesticide and zero waste had become the key point [4].

**Table 4.** Potentials and Constraints SWOT Analysis

Matriks SWOT / TOWS	Strength (S) (Internal)	Weakness (W) (Internal)
<p>Opportunities (O) (External)</p>	<p>SO: Agriculture as the biggest natural potential of Kampung Baran was supported by the skills, experiences of Baran farmers. The fresh air, green panorama, and hilly land are the opportunities in developing Kampung Baran as an agricultural-tourism destination. This theme had been popular in time among the urbanist lifestyle. Baran people had unique cultures expressed in language, architecture, traditional performance, and social relationships. They obeyed <i>Kyai</i> as their leader. Baran’s location was very strategic and accessible enough although the infrastructure had to be improved for tourism needs.</p>	<p>WO: Education, poverty, some socio-cultural changes from a rural-agricultural lifestyle into an urban-modern lifestyle were the weaknesses. Baran was accessible enough from the heart of Malang City, but the infrastructure needed to be developed. PDAM as the clean water provider had to ensure the adequacy of <i>Kampung</i> Baran’s clean water resources. Baran people had to be trained to speak Indonesian better especially in their communication with the tourists Some approaches to Baran people and <i>Kyai</i> should be conducted to increase the social-participation.</p>
<p>Threats (T) (External)</p>	<p>ST: Baran people were in an agricultural lifestyle, although it gradually changed into an urban-modern lifestyle. The changes in the land use and land-ownership into the private plantation and housing area of the outsiders had put Baran people as laborers in the sugar-cane farm and construction. They own the rest land that was at the front and backyard of their house. The tourism development program must not harm socio-cultural values. The development should be based on socio-ecological paradigms, by developing its very potential, which were agriculture and green-rural atmosphere. Some modern agriculture techniques could minimize the problems.</p>	<p>WT: The program aimed to increase social welfare by developing its potential using some modern technics based on socio-ecological paradigms By strengthening its local potentials (physical and social capital), the program would be well carried out and minimize the threats. The security from the theft must be improved. By increasing the education and economic level, this threat could be minimized.</p>

The organic-farming theme was the popular theme for the modern-urban lifestyle [30, 31]. People needed to be healthier and stronger, especially in facing the pandemic and any other critical diseases. Healthy food, fresh air with green scenery had become their needs. The strategic location of *Kampung* Baran would be the right choice for a green-tourism destination for the urbanists.

In developing the new farming concept, we have to face the reality of lower-income and lower education people. They need to be well-educated about the integrated organic farming systems. In the last two years, some programs could not run well because it was not easy asking people to try some new technics. The government and other institutions had responsibilities to educating Baran farmer and their younger generation. It was conducted by some strategies and approaches, so Baran farmers were willing to practice and give their participation in the programs. On the other hand, most of Baran's people were full-day workers. The first organic farming activities introduced to the people must be the easy one that could be conducted in their spare time, need not much energy, and money wasted.

Some formulated strategies by considering the potentials, problems, and SWOT analysis were:

1. The organic-integrated farming activities criteria were:
  - a Easy to do, even for sugar-cane labor women
  - b Conducted at home as a side-job
  - c Optimal usage of the local potentials
  - d The products had economic value, and support other community activities, especially economic activities.
  - e Safe and minimal maintenance
  - f Had economic benefits in a short time
  - g Had sustainable values.
  - h Had other benefits in the ecosystem balancing, such as zero-waste, a wider green area, and increasing local and organic products.

According to those criteria, organic waste bio-conversion to be organic fertilizer seems to be the best choice. The raw material was livestock manure and kitchen organic waste. It was in abundant stock in Baran. It had benefits for Baran farmers directly. As Ponnusamy's research, integrated farming could increase the farmer's income by producing other benefits, even from the waste [7]. It would solve more the one problem: the farmer's need for fertilizer, minimizing waste, increase environmental and people's health, and an alternative income for the Baran people. The technic chosen were vermicomposting and liquid organic fertilizer (*pupuk organik cair* - POC). The vermicompost production uses African Night Crawler worms, while the POC production uses bio-degradation liquid that is produced by using local organic materials. Those two activities were easy enough, need little time, and could be the side economic activities [32–35]. The worm could also become a new income, for example for the cosmetics industry and protein supply material for animal

feed.

2. The program needed more social and mutual participation internally and externally. *Kyai* or *ustadz* as Baran leaders were the key person in increasing it.
3. The religious lecturer and recitation (*pengajian*) had important means as media for delivering modern-organic farming knowledge and technics.
4. Baran must have *innovators*. The first activities may be followed by only some people, so it should push the birth of innovators. By intensive accompaniment, the innovators would lead and influent others to support the programs
5. Baran people might not believe and do bioconversion at one time. They need some proofs that the activities conducted could give them benefits. The waste bio-conversion products had to be proven to the plants, and make money.
6. Baran people might refuse the fertilizer to be applied to their plant. They would not take any risks and make a loss. Therefore, it would be better, if the vermicompost and POC were applied to vegetables planted in polybags. Vegetables need only 3-4 weeks from sowing seeds to harvest. The vegetables provided organic food for themselves at once. With some benefits they got, social participation would arise and this program would be more successful.

## 4. Conclusion

Waste bioconversion into organic fertilizer was chosen as strategies for developing the natural and agricultural potential of *Kampung* Baran. This economic and ecological activity supported and developed the agricultural activities, minimizing waste, increasing the environment quality and health, and providing an alternative to increasing the economic level. *Pengajian*, *Kyai*, *ustadz*, and FGD were media for approaching the Baran people to increase social participation. Those media were also effective for knowledge transfer, accompaniment, and intensive mentoring. The innovators were chosen as the model and motivators for others. To increase social participation in succeeding in the Edu-tourism program, it was important to make Baran people feel the benefits.

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