

Sustainability Analysis of Yard Management in Ecological Aspects

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Abstract

The yard is one land use formed through human interaction with the environment. This research uses human ecology theory, which discusses the reciprocal relationship between the Trucuk village community (social system) and the yard (biophysical system). This study aims to describe the yard's condition and identify the meaning, function, and factors influencing yard management. This study used a combined quantitative and qualitative approach (mixed methods). The design used for the quantitative approach is a survey, and a case study for the qualitative approach. The sampling technique in this study was cluster sampling. Most communities in Trucuk village have a yard with an area of <120 m². 75% of the communities manage their yards, while 25% neglect them. The meaning of the yard in the Trucuk Village Community is to refurbish the houses and food barns, increase family income, empty land use, plant hobbies, and act as an asset. The functions of the yard include gene resource conservation and socio-economic and aesthetic functions. This research can be used as a reference for empowerment activities or village community development.

Keywords: food barns, human ecology, socio-economic, yard

INTRODUCTION

The government prioritized yard management in 2024 through the Minister of Village, Development of Disadvantaged Regions, and Transmigration Regulation Number 7 of 2023. Based on the policies that have been established, the village government, which is the target of the program, must estimate at least 20% of the village fund budget allowance received for food sustainability. The priority of food sustainability in 2023 can be achieved through programs such as strengthening village-level food resilience and developing farmland management. The land management of the park can be distinguished by its size. The land area (especially in the countryside) can be distinguished into three areas: large land (>400m²), medium land (120-400m²), and narrow land (<120m²) [1].

Based on these policies, the Village Government, the program's target, must budget a minimum of 20% of the Village Fund budget ceiling received for food security. Food security, prioritized in 2023, can be realized through programs such as strengthening village-level food security by developing yard management

Pekarangan Pangan Lestari (P2L). The yard is one of the agroforestry systems because it has important characteristics possessed by agroforestry systems; for example, it has the principles of ecological and social sustainability where annuals, trees, ornamental plants, vegetable plants, fruit plants, and other plants can live together. Therefore, the success of yard management cannot be separated from human intervention. Meanwhile, human life depends on the surrounding environment, including the yard. Research on yard management in the Trucuk Village community will not only describe yard management. Still, it will also reveal the other side of the yard as a way of life for residents, seen from the point of view of residents reflected in their behaviors. This research is helpful for families, communities, agricultural extension workers, village governments, and local organizations.

The yard is one land formed through human interaction with the environment. Therefore, the success of yard management cannot be separated from human intervention. Meanwhile, human life itself is very dependent on the surrounding environment. This shows that there is a reciprocal relationship between humans and their yards. The relationship is created due to the two's material, energy, and information flow. Humans use plants in their yards, such as fruits, spices, vegetables, and horticultural products. The human action in managing yard land is

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influenced by various elements within and outside the human itself, such as technology, economy, population, skills, local wisdom values, and other components.

The area of the yard of KRPL is classified in the narrow yard group with a percentage of 62.5%; the yard area is used as a reference, which shows that the wider the development of KRPL is increasing [2]. Utilization of yard into KRPL in the Mekar Bayu farmer youth group cannot yet be the main thing because most of them make KRPL for basic needs, which is only sometimes utilized [3]. The intensification of the yard has an important role as a provider of household food and nutrition as well as a source of additional income [4]. Commodity selection for yard management is determined by considering food and nutrition needs, food diversification based on local food sources, preservation, and the possibility of commercial development based on the area [5]. Based on the review of previous research, there are some similarities. The first difference is in the research location. The research location chosen in this thesis is Trucuk Village, Trucuk District, Bojonegoro Regency. The difference in research location and characteristics will be something from the previous one, which focuses more on implementing activities. Through the gap in earlier research, the researcher wants to conduct a study that focuses on analyzing the meaning and function of the yard for a community and the factors that influence the management of the yard.

This research is helpful for families, communities, agricultural extension workers, village governments, and related regional organizations in the Bojonegoro Regency as it adds insight into yard management. Therefore, the author seeks through this thesis to describe the condition of yard land management and identify the meaning and function of the yard for the family. so that problems with yard land management in Trucuk Village can be analyzed. These problems are expected to be a priority for related parties in the following year. In addition, further research needs to be done to analyze the role of agricultural extension workers or village governments in the management of yard land in the Trucuk Village area, Trucuk Subdistrict, Bojonegoro Regency. The management of yard land in the Trucuk Village community results from mutual interaction between humans (social system) and yard land (biophysical system), and the factors that influence it are the focus of this

research, which becomes the research framework as shown in Figure 1. The research framework adopts a reciprocal relationship between the social system and the biophysical system [6].

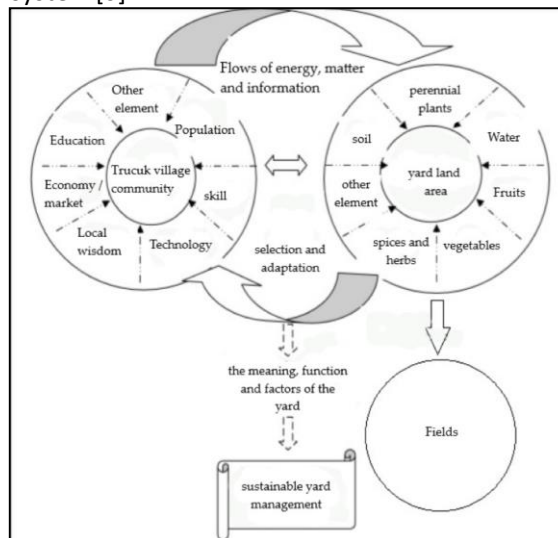


Figure 1. Yard management in Trucuk village community as a reciprocal relationship between social system and biophysical system form [6]

MATERIAL AND METHOD

In this thesis, researchers analyzed the management of yard land in the Trucuk Village community, Trucuk District Bojonegoro Regency. This research used a combined quantitative and qualitative approach. The design that will be used for the quantitative approach is a survey and a case study for the qualitative approach because it aims to obtain in-depth data on actual problems. Population is a generalization area consisting of objects or subjects that have specific characteristics set by researchers to study and then draw a conclusion [7]. Based on the definition of population above, it can be interpreted that the population is the total number of research subjects who follow the process of managing yard land. The population used is all families in Trucuk village in two neighborhoods, namely 006 and 016. The sample used was all family members (housewife, head of household, children) residing in neighborhoods, namely 006 and 016. By using this method, the study was conducted in a more efficient time and cost. In addition, this method is highly valid because each sample represents the characteristics of a large population. The calculation of the number of samples used by researchers using the Slovin formula according to [8]:

$$n = \frac{N}{1 + N(d)^2}$$

Description:

n = sample

N = total population

d = selected error rate (1%, 5% and 10%)

So, the total sample size obtained is 68 family members. The sampling technique in this thesis was cluster sampling. Cluster sampling is a technique used when researchers face that the sampling frame used for sample selection is not available or incomplete and the cost of making the sampling frame is too high. This research instrument is used to obtain data through in-depth interviews. The in-depth interviews focused on the meaning and function of yards and discussed the relationship between social systems and yard management.

Data Collection

Data was collected using in-depth interviews, observation, and documentation. Researchers used in-depth interviews whose questions didn't use interview guidelines. That had been arranged wholly and systematically for data collection. The purpose of conducting in-depth interviews in this study is to obtain thoughts, functions, meanings, and influencing factors in managing the yard for the Trucuk village community. The observation technique is a data collection activity involving symptoms, phenomena, and empirical facts related to research problems. Researchers directly observed the management of yard in the Trucuk village community. The documentation obtained was used to complement the data in this research. The data that can be generated is related to the area's condition and the Trucuk village's boundaries. Other supporting data was obtained from relevant agencies such as the village or Trucuk district offices. Data from documentation can also be obtained from various libraries, literature, and media.

Data Analysis

Quantitative data will be analyzed using non-parametric statistics (Chi-quadrat) and descriptive statistics (cross table). Non-parametric statistical analysis chi-square tests the relationship between two nominal variables and another.

RESULT AND DISCUSSION

In this study sample selected by the researcher, the characteristic of the respondent is a picture of the respondent's identity. The

characteristics of respondents based on the area of yard land can be seen in Table 1.

Table 1. Respondents characteristics according to the size of their yards

Yard area (m ²)	Total (Person)	Percentage (%)
10-100	49.0	72.0
100-300	8.0	12.0
>300	11.0	16.0
Total	68.0	100.0

Sources: Primary data processed, 2023

Based on table 1 shows that the largest size of the yards owned by the Trucuk Village community is 10-100 m² with 49 families (72%). Followed by the area of 100-300 m² is owned by 8 families, with a percentage of 12%. 11 families own yards of >300 m² with a rate of 16%. This shows that the area of yard land in the Trucuk Village community is included in the narrow yard type because it is in the range of <120 m². Based on the results of in-depth interviews with respondents, the size of the yard owned by each family varies greatly because many yards have been converted. The statement of [9] states that changing the function of yard land creates a separate concern for food availability. Therefore, yard land must be managed as well as possible to fulfill the needs of life and maintain food availability.

Based on the observation, there are several functions of yard land for families, including economic function, gene resource conservation function, microclimate effect function, and aesthetic function. The economic function of many respondents' opinions about yard management can help reduce household expenses. Although the utilization of yard products is not every day, at least in one week, they have taken it for daily needs. Family income from the sale of yard products depends on the amount of crops owned. The bigger the harvest, the bigger the family income from the yard. This is to the statement of [10], which states that farm income is strongly influenced by the number of farm products sold by the farmers themselves, so the more farm products, the higher the number of products sold strongly influences the net income obtained and business efficiency, the higher the net income received.

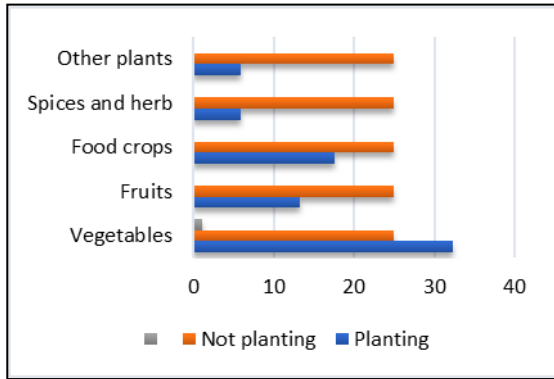


Figure 2. Respondent characteristics based on the type of plants in the yard

The types of crops grown in the Trucuk Village community are diverse, ranging from vegetable crops (spinach, kale, tomatoes, chili, cauliflower, celery, chives, moringa) to food crops (corn, cassava, cassava, cassava vines, yams); fruit crops (papaya, banana, guava, sugar apple, mango, jackfruit, longan); spices and medicinal plants (lemongrass, turmeric, ginger, amazon nuts, betel leaves) and other plants (various types of flowers, teak trees). Based on the interviews, vegetable planting is the most common because they assume that planting vegetables will make it easier for housewives to fulfill family nutrition without spending money. [11] stated that planting any type of plant in the yard can satisfy the family's nutritional needs and ensure food availability. The interviews also showed several meanings of the yard in the Trucuk Village community, such as providing aesthetic function, food availability, utilizing vacant land, producing food crops, as a traditional pharmacy, and as an asset. This is to the statement of [12], which states that a yard utilized on an ongoing basis can provide positive benefits, convenience, and support the needs of the family inhabiting the house. The functions of yard land show the importance of optimizing management and can be used as an alternative to realizing household food self-sufficiency. The observation results show several functions of yard land for families, including economic, gene resource conservation, microclimate effect, and social and aesthetic functions.

Economic functions

The economic functions from many respondents' opinions about yard management can help reduce household expenses. Although the utilization of yard products is not every day, at least in one week, they have taken yard products for daily needs. Family income from the sale of yard products depends on the amount of

crops owned. The bigger the harvest family income from the yard. This is to the statement of [13], which states that income is strongly influenced by the number of farm products sold by the farmers themselves, so the more farm products, the higher net income obtained, and business efficiency is strongly influenced by the number of product sold the higher net income obtained.

Gene resource conservation functions

The function of conserving gene resources is in the form of the many types of plants owned by community families, for example, banana (kapok banana, raja banana, susu banana, and cavendish banana) and mango (grading mango, manage mango, and podding mango). Some of these crop varieties have high quality in terms of selling value. For example, the value of raja banana is higher than that of other banana types. It has a distinctive aroma and a sweeter taste. This is especially true for banana collectors who resell the bananas in the *ledre*-making process.



Figure 3. Ledre- making process

The sweet taste and distinctive aroma are traits that can be passed down through genes. So, managing yard land by planting various plants can contribute to the preservation of gene resources. This is in line with the statement of [14], which states that in a yard, there is a function of safeguarding (protecting) genetic resources, as seen from the number of plants in the yard.

Microclimate effect functions

Microclimate effects are the climatic conditions of the local environment that have a direct or indirect effect or influence on the environment. The management of yard land in the Trucuk village community shows the function of microclimate effects. This can be seen from the opinions of several respondents who stated that one of the reasons for managing yard land by planting various kinds of plants is to create a relaxed environment. Family homes that manage their yards by planting multiple plants feel more

relaxed than those that have yards but are not handled. This is because the plants in each household provide different microclimate effects. For example, in families that planted bananas in their yard, the air humidity will increase compared to families that did not plant. Meanwhile, families that planted trees (mango trees, jackfruit trees, guava trees) had cooler air temperatures than families that only planted various ornamental plants.

Social functions

The community considers families with open yards to have a higher social level than families with closed yards (fenced). This is because an open yard (without a fence) does not limit anyone, including neighbors, from communicating with the landowner. This is by [15] statement that the social function of the yard can originate from the service of exchanging yard products between neighbors and a place for children to socialize with their neighbors. In addition, the social function of the yard has the principle that the development of the yard is a means to bind togetherness, cooperation, and social relations between members of the local community.

Aesthetic functions

Yard land that is well managed and pays attention to good place arrangement will provide a beautiful, attractive, comfortable, healthy environment. As well as community families who grow vegetables while maintaining the arrangement will still get an aesthetic function. It can be underlined that the aesthetic function of yard land is not only intended for community families who grow ornamental plants. The statement of [16] states that the function of ornamental plants in the yard is to increase the house's aesthetic value and as a social value with the habit of exchanging between neighbors so that it can improve neighborly relations and contribute to the value of plant species diversity in the neighborhood.

Table 2. The effect of the variable on yard management

Variable	Yard management				P-value
	Manage		Not managing		
	N	%	N	%	
Head of Household Education Level					
Low Education Level	33	48.5	7	10.2	

Moderate education level	16	23.5	9	13.2	
High Education Level	2	2.9	1	1.4	0.232
Housewife Education Level					
Low education level	31	45.5	9	13.2	
Moderate education level	17	25.0	7	10.2	0.837
High Education Level	3	4.4	1	1.4	
Type of Technology					
Traditional technology	37	54.4	7	10.2	0.019
Modern technology	14	20.5	10	14.7	
Families total					
Families total ≤ 3	39	57.3	6	8.9	0.016
Families total > 3	12	17.9	11	16.4	
Economic level					
have already sold yard products	32	47.7	5	7.4	0.141
Haven't already sold yard products	19	27.9	12	17.9	
Local wisdom					
Trust in local wisdom	36	53.7	8	11.9	0.0787
Not trusting local wisdom	15	22.0	9	13.4	

Based on Table 2, the results between the effect head of household education level with yard management chi-square test obtained a p-value (0.837); based on this value, because $p > 0.05$, it can be concluded that a person's level of education is not significantly associated with the management of yard land in the Trucuk Village community. The results of this thesis are also reinforced by interviews with respondents who stated that in managing their yard land, there was no intervention from their children, who had higher education levels. Other respondents with information on the occupation of the head of the family as self-employed and housewives as civil servants stated that they did not often pay attention to the condition of their yard land. They think that as long as the yard is clean and does not disturb the neighbors, it is not a big problem. This is based on the statement of [17], which states that based on the importance index, the most important factor in managing yard land perceived by managers is soil fertility. In contrast,

managers perceive education as not being an important factor in managing yard land.

The results between the types of technologies with yard management chi-square test obtained a p-value (0.019). Based on this value because $p < 0.05$, it can be concluded that technology is significantly associated with the management of yard land in the Trucuk Village community. Community families have adopted several technologies in managing their yards. [18] These technologies include horticulture, hydroponics, pots, polybags, grafts, conventional planting, and raised beds. This is stated by the statement Suparwoto [18], which states that the adoption of technological innovations needs to be empowered to optimize yard land for the creation of sustainable food availability.

The results between the effect number of families with yard management chi-square test obtained a p-value (0.0016). Based on this value, because $p < 0.05$, it can be concluded that population (number of families in the household) significantly affects yard management in the Trucuk Village community. Fewer family members means fewer needs to be met by the family and vice versa. Therefore, a large number of families will be followed by a large number of needs that must be met. This is also the case in the context of yard management. The more family members there are, the more energy will be needed to participate in the process of managing the yard.

The results between the economy (market) with yard management chi-square test obtained a p-value (0.0141); based on this value, because $p < 0.05$, it can be concluded that the economy (market) is significantly associated with yard management in the Trucuk Village community. by managing the yard can reduce daily expenses for food needs, sometimes even selling yard products to neighbors in need. They perceive that although their yard products have a relatively low selling value, the family can still benefit from them. Yard products include spinach, kale, chili, and other types of plants. The management of this yard provides a solution to food availability where previously, in meeting daily needs, we had to buy processed kitchen products directly from the market or traveling vegetable sellers with an average expenditure for one family of IDR 70,000.00 per week. However, with the management of this yard land, the community can save money on household food costs to divert expenses for others. This is to the statement [19], which states that yards play an

important role in developing productive landscapes, including social, economic, and ecological functions.

The results of the types of local wisdom with yard management chi-square test obtained a p-value (0.0787); based on this value, because $p > 0.05$, it can be concluded that local wisdom values are not significantly associated with yard management in the Trucuk Village community. Several types of local wisdom exist in the Trucuk village community, such as transcendental, the use of banana leaves as a wrapper for *lontong kikil* (a culinary icon of Trucuk village, *lontong kikil* is a dish made from beef kikil (feet). It is served with lontong (rice cake) and doused in a rich, spicy sauce) and the *jumat pon* routine activities.



Figure 4. *Lontong kikil*, a culinary icon of Trucuk Village

This is based on the statement [20] based on gastronomic ethnobiology: the diversity of traditional foods in rural ecosystems of West Java is strongly influenced by the diversity of the local biophysical environment and local cultures. Believing and interpreting the existence of local wisdom values is the same as preserving the environment [21]. This is because the community family thinks local wisdom is a tradition that must be maintained. At the same time, the management of yard land is a person's right, whether or not it is the landowner's decision. The statement [22] states that the approach that must be taken to achieve this is developing sustainable agriculture, utilizing local resources (local wisdom), and community empowerment.

CONCLUSION

Most Trucuk village community interpreted the yard as an additional family income. In addition, one of the functions of the yard is the economic function. These two things must be underlined and made a priority by the relevant government. This is also supported by the results

of the Chi-square test, which shows that one of the factors that influence the management of a yard is economic (market) factors. Therefore, yard land management in the Trucuk village community is expected to be able to encourage sustainable food availability.

The suggestion that researchers provide after researching this problem is for further researchers who will conduct the same research to develop ecological aspects in biophysical. Practically, this research is expected to provide solutions in developing food security at the village level. Especially in the field of village community empowerment through the development of yard land management.

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