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Community Study of Local Fruit Producing Trees of Economic Value in Uraur Village, West Seram District

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ABSTRACT

Local fruit is one type of natural wealth in Indonesia which has many benefits in the economic sector. Local fruit plants in Indonesia are a fairly large source of income in the agricultural sector to help the community's economy, especially the people of Maluku Province. Uraur Village is one of the villages in Maluku Province. This research aims to determine and explain the community structure and habitat of local fruit-producing trees, including tree types, number of individuals, density, frequency, dominance, importance value index and diversity index. The method used is quantitative descriptive. The environmental parameters measured are soil and air temperature, soil and air humidity, pH and light intensity. The results of this research found 19 types of local fruit plants with 12 families and 12 genera with species diversity belonging to the medium category. Environmental parameters at the research location support the growth of local fruit plants because the habitat at the research location is relatively good. Air temperature ranges from 29-35ºC, soil temperature ranges from 28.4-32.16ºC, air humidity ranges from 44-68%, soil moisture ranges from 28.4-32.2%, pH 7 and light intensity ranges from 694 -1541 lux.

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INTRODUCTION

Indonesia is a country known for its high level of biodiversity, such as the potential for abundant natural wealth and biodiversity, supported by a large area with many islands in the tropics. Indonesia has a large forest area, amounting to 99.6 million hectares or 52.3% of Indonesia's territory. Forests have an important role for living creatures on earth. Various benefits are obtained from forests, including producing oxygen, preventing landslides and water sources which can also increase the productivity of agricultural products, fisheries and support food security.

Indonesia has a variety of horticultural products with a variety of germplasm and various varieties that enable efforts to develop fruit, vegetables and flowers. Horticultural plants have several functions, namely as a source of food, medicine and also as a provider of employment opportunities. Horticulture is one of the agricultural subsectors that has the potential to be developed because it has quite high economic value, good quality, affordable prices and is safe for consumption.

Maluku is a province that is geographically included in the archipelago and several of its islands have large plains, one of which is Seram Island. Seram Island has an area of 18,562 km^2, with a length of 340 km and a width of 60 km, has extensive nature and is suitable for agricultural cultivation. Fruit plants are one of the natural resources that have the potential to be developed in the plantation subsector. Many villages on Seram Island produce local fruit because some of the village people on Seram Island make their living as farmers by cultivating secondary crops, horticulture and plantations, one of which is Uraur Village (Augustyn, 2013).

Uraur Village is one of the villages in West Seram Regency which is located in a lowland area. The area of Uraur Village is 29.16 km2 (Augustyn, 2013). Uraur Village has abundant natural resources and the community also has a tradition passed down from generation to generation, namely sasi which is usually done during the fruit season, to ensure that the fruit is not stolen by other people. These fruit products are the main source of income for farmers and fruit traders in Uraur Village. Apart from being sold, these fruits can be consumed directly or processed by the community and used as traditional medicine. Considering that fruit production supports the community's economy, the local fruit-producing trees in Uraur Village are strictly protected by the community so that they continue to produce fruit and the existence of the fruit trees is not threatened with extinction. So far there has been no written data about the local fruit producing tree community in Uraur Village. Based on this background, research on the study of local fruit-producing tree communities in Uraur Village, West Seram Regency needs to be carried out.

MATERIALS AND METHOD

Research Type. Research is field research with a quantitative descriptive research type

Research Location and Time. The research was conducted in Uraur Village, Kairatu District, West Seram Regency. This research was carried out in Uraur Village in September 2023.

Figure 1. Research Locations (Source Google Earth Pro)

Tools and materials. The tools used in this research were a camera, stationery, raffia rope, meter roll, stakes, soil tester, hygrometer, thermometer, lux meter and label bag measuring 30cm × 50cm. Meanwhile, the materials used in this research were local fruit-producing tree species in Uraur Village, West Seram Regency. The local fruit referred to in this research is local fruit that grows or is planted in Uraur Village.

Research Procedures

Field Survey. Field surveys are carried out as preliminary observations at the research location with the aim of being able to identify and determine the observation location points. Before conducting a field survey, a research permit process must be carried out first with the village head and owner of the hamlet that will be used as a research site in Uraur Village, West Seram Regency.

Determining Observation Location Points and Plot Placement. The observation location is divided into four areas. In each area, plots are placed in areas where local fruit trees grow or are planted to represent each area where there is local fruit tree vegetation. Plots measuring 20m × 20m for tree level vegetation, plots measuring 10m × 10m for pole level vegetation.

Observation and Data Collection. After dividing the research area, plots will be placed in each area where there is a distribution of woody plant vegetation. Every species present in each plot will be recorded. Data collected from each observation plot is the type and number of individuals of each type. The data obtained is recorded in the observation table. Next, samples were collected for plant species whose scientific names were unknown by photographing them and taking plant parts for identification. Then the plant parts or samples taken are put into a labeled bag measuring 30cm × 50cm which has been given a number.

Measurement of habitat conditions. Measurements were carried out by looking at the condition of environmental parameters in the habitat at the research location. Measurement of environmental parameters includes temperature (air and soil), humidity (air and soil), soil pH, and light intensity.

Data analysis. Data analysis was carried out quantitatively. Quantitative analysis is carried out to explain vegetation structure and species diversity by calculating:

a. Density

Density is the number of individuals of each species found in a sample plot. The density of each plant species can be calculated using the formula:

$$\text{Absolute Density: } AD = \frac{\text{Number of Individuals of a Species}}{\text{Area of Sample Plot}}$$

$$\text{Relative Density: } RD = \frac{\text{Absolute Density of a Species}}{\text{Sum of Densities of All Species}} \; x \; 100\%$$

b. Frequency

Frequency is the number of presences of each species found in all sample plots created. Species frequency can be calculated using the formula:

$$\text{Absolute Frequency: } AF = \frac{\text{Number of Sample Plots occupied by Species}}{\text{Number of Sample Plots}}$$

$$\text{Relative Frequency: } RF = \frac{\text{Absolute Frequency of species}}{\text{Total Number of Sample Plot Areas}} \; x \; 100\%$$

c. Dominance

Dominance is the area of the tree base or the area of canopy cover for each species found in the plot. Dominance can be measured by the formula:

$$\text{Dominance of Absolute: } DA = \frac{\text{Total Area of Species Base Fields}}{\text{Total Number of Areas of Sample Plots}}$$

$$\text{Dominance of Relative: } DR = \frac{\text{Absolute Dominance of Species}}{\text{Total Dominance of all Species}} \; x \; 100\%$$

Where area of the base fields*:*

$$B = \frac{1}{4}\pi D^2$$

d. Importance Index Value

Importance Index Value (IIV) Shows the species that dominate at the research location. To calculate the Important Index Value, the formula is used:

IVI: Relative Density (%) + Relative Frequency (%) + Relative Dominance (%)

e. Diversity Index

Shannon-Wiener Diversity index used to compare various plant community. According to Magurran (1988), diversity of a species in a community calculated in the following way:

$$H' = -\sum Pi \ln Pi$$

Where $Pi = \frac{ni}{N}$

With: H': Shannon index/diversity index
ni: The importance of each species
N: Total important value

Criteria: H'< 1: Low species diversity
1 ≤H'≤3: Medium species diversity
H'> 3: High species diversity

RESULTS AND DISCUSSION

Types of Local Fruit Plants found in Uraur Village

The results of research on all observation plots of pole-level plants and tree-level plants found 19 species of local fruit-producing plants of economic value, from 13 genera with 13 families. The species most commonly found was the langsat (*Lansium domesticum* Corr) with 42 individuals. Meanwhile, the fewest species are mango (*Mangifera indica*), breadfruit (*Artocarpus altilis*), kuweni (*Mangifera odorata*) and pomelo (*Citrus maxima*) each with 1 individual **(Table 1)**.

Table 1. Types of economically valuable fruit plants found in Uraur Village

Family	Genus	Spesies	English Name
Meliaceae	Lansium	*Lansium domesticum*	Duku
		Lansium domesticum Corr	Langsat
Sterculaceae	Theobroma	*Theobroma cacao* L	Cocoa
Anacardiaceae	Bouea	*Bouea macrophylla*	Gandaria
	Mangifera	*Magifera foetida*	Bachang
		Mangifera indica L	Mango
		Mangifera odorata	Kuweni
Malvaceae	Durio	*Durio zibethinus* L	Durian
Myrtaceae	Syzygium	*Syzygium malaccense*	Malay apple
Burseraceae	Canarium	*Canarium ovatum*	Walnut

Family	Genus	Spesies	English Name
Moraceae	Artocarpus	*Artocarpus integer*	Cempedak
		Artocarpus heterophyllus	Jackfruit
		Artocarpus altilis	Breadfruit
Sapindaceae	Nephelium	*Nephelium lappaceum*	Rambutan
Clusiaceae	Garcinia	*Garcinia mangostana*	Mangosteen
Lauraceae	Persea	*Persea americana*	Avocado
Rutaceae	Citrus	*Citrus maxima*	Pomelo
Fabaceae	Parkia	*Parkia speciosa*	Petai
Annonaceae	Annona	*Annona muricata*	Soursop

The types of plants in Table 1 above are the types of plants whose fruit is usually bought and sold by the people of Uraur Village. At the time this research was carried out, the plants at the pole level and tree level had not yet produced flowers and had not yet produced fruit. This is because these types of plants in Uraur Village have not yet entered the fruit season. When the fruit season comes, people will harvest and sell the fruit at the market. In Kairatu District there are two markets that are usually used for buying and selling activities, namely Kairatu market and Gemba market. Most people in Kairatu District carry out buying and selling activities at the Gemba market because the Gemba market is the main market or central market, while the Kairatu market is not the center of the market because the number of buyers and sellers is only people who live close to the Kairatu market.

Unlike other fruits, only the seeds are sold in chocolate. Before being sold, the cocoa beans are dried in the sun until dry and sold by the kilo. Dried cocoa beans are not sold at Gemba Market or Kairatu Market but are sold to collectors of cocoa beans. The cocoa plant was previously cultivated by the people of Uraur Village because it had excellent fruit yields and a high selling price. But as time goes by, the chocolate plants experience pest attacks so that the cocoa trees become damaged and the size of the fruit and seeds decreases. This causes the yield of harvested cocoa to decrease. Even though harvest yields are starting to decrease or decrease, people still leave the plants uncut and not cared for properly. Because the selling price of cocoa beans is high, people only care for cocoa plants when the fruiting season is near.

In general, it can be said that the 19 types of fruit plants listed in table 1 above are local fruit plants that have economic value because they can be sold and provide income for the community. From the observations, langsat fruit (*Lansium domesticum* Corr), cocoa (*Theobroma cacao* L.) and durian (*D. Zibethinus* L) are types of fruit that are classified as expensive or have a high selling value among the fruits in Uraur Village. However, the price of fruit fluctuates, depending on the amount of fruit produced, if a lot of fruit is produced then the selling price will fall.

The results of the research show that fruit-bearing plants at the pole level have a greater number of fruit plants compared to the tree level and are of economic value. Some types of plants only exist at the pole level and some other types only exist at the tree level. Langsat fruit plants (*L. domesticum* Corr), cocoa (*T. cacao* L), durian (*D. zibethinus* L), cempedak (*A.integer*) and rambutan (*N. lappaceum*) respectively are the first five types of pole level fruit plants which have a large number of individuals compared to other types. These five types of plants provide 9 types of fruit-bearing plants at tree level. In fruit-bearing plants at tree level, durian and kanari are the types with a greater number of individuals compared to other types at tree level **(Table 2)**.

Table 2. Data of Types and Number of Fruit-Producing Plants found in Uraur Village based on pole and tree level

English name	**Species**	**Number of Individuals**	
		Pole Level	**Tree level**
Langsat	*Lansium domesticum* Corr	42	1
Cocoa	*Theobroma cacao* L	22	1
Durian	*Durio zibethinus* L	13	3

English name	Species	Number of Individuals	
		Pole Level	Tree level
Cempedak	*Artocarpus integer*	9	1
Rambutan	*Naphelium lappaceum*	8	
Duku	*Lansium domesticum* Corr *duku*	4	
Avocado	*Persea americana*	3	
Jackfruit	*Artocarpus heterophyllus*	3	
Gandaria	*Bouea macrophylla*	2	
Bachang	*Mangifera foetida*	3	
Soursop	*Annona muricata*	3	
Petai	*Parkia Speciosa*	2	1
Mangosteen	*Garcinia mangostana*	2	
Walnut	*Canarium ovatum*	1	2
Mango	*Mangifera indica* L	1	
Malay apple	*Syzygium malaccense*	1	1
Pomelo	*Citrus maxima*	1	
Kuweni	*Mangifera odorata*		1
Breadfruit	*Mangifera altilis*		1
	Total	121	12

Breadfruit and kuweni are tree-level plants that do not have pole levels. If the breadfruit and kuweni plants die in the near future due to being cut down or because the plants are old, then there will be no replacement for the two plants in the area. The number of species and individuals at tree level is less than the number of species and individuals at pole level because large fruit-bearing plants at tree level have been cut down by the community to meet wood needs such as making house boards or buying and selling. Apart from that, village development activities and the conversion of garden land into residential areas are also causes of a reduction in the types and number of individual fruit-bearing plants at tree level.

Relative Density, Relative Frequency, Dominance of Relative and Importance Index Value

The results of calculating relative density, relative frequency, relative dominance and Importance Value Index of local fruit plants in Uraur Village at pole level can be seen in **Table 3** and tree level can be seen in **Table 4**.

Table 3. Relative Density, Relative Frequency, Dominance of Relative and Importance Index Value of Fruit-Producing Plants at Pole Level

English Name	Species	RD (%)	RF (%)	DR (%)	IIV (%)
Langsat	*Lansium domesticum* Corr	34.14	21.56	70.11	125.82
Cocoa	*Theobroma cacao* L	17.88	13.72	6.10	37.72
Durian	*Durio zibethinus* L	10.56	5.88	11.00	27.46
Cempedak	*Artocarpus integer*	7.31	7.84	6.34	21.50
Rambutan	*Naphelium lappaceum*	6.50	9.80	2.79	19.10
Duku	*Lansium domesticum* Corr *duku*	3.25	5.88	0.29	9.43
Avocado	*Persea americana*	2.43	5.88	0.45	8.78
Jackfruit	*Artocarpus heterophyllus*	2.43	3.92	0.81	7.17
Gandaria	*Bouea macrophylla*	1.62	3.92	0.12	5.67

English Name	Species	RD (%)	RF (%)	DR (%)	IIV (%)
Bachang	*Mangifera foetida*	2.43	1.96	0.58	4.98
Soursop	*Annona muricata*	2.43	1.96	0.16	4.56
Petai	*Parkia Speciosa*	1.62	1.96	0.42	4.01
Mangosteen	*Garcinia mangostana*	1.62	1.96	0.19	3.77
Walnut	*Canarium ovatum*	0.81	1.96	0.31	3.08
Mango	*Mangifera indica* L	0.81	1.96	0.06	2.83
Malay apple	*Syzygium malaccense*	0.81	1.96	0.05	2.83
Pomelo	*Citrus maxima*	0.81	1.96	0.02	2.79
	Total	97.56	94.11	99.88	291.56

The highest density was found in pole level plants, namely langsat (*L. domesticum* Corr) with a value of 34.14%. Meanwhile, the plants with the lowest density values were 4 individuals, namely mango (*M. indica* L), pomelo (*C. maxima*), malay apple (*S. malaccense*) and walnut (*C. ovatum*) with a value of 0.81% each. The high density of langsat plants is because people tend to plant plants that have good selling value and provide more benefits in the economic sector, to meet people's living needs. According to Pithaloka et al, (2015), the higher the density, the higher the level of competition, likewise, if the density level is lower, the level of competition will also decrease. Plant density is a factor that influences plant growth, because the absorption of solar energy by the surface of the leaves greatly determines plant growth. Density can also inhibit vegetative development and reduce crop yields due to reduced photosynthesis rates and leaf development.

The highest presence frequency value at the pole level is the langsat plant (*L. domesticum* Corr) with a value of 21.56%. Meanwhile, the plants with the lowest frequency values are bachang (*M. foetida*), soursop (*A. muricata*), petai (*P. speciosa*), mangosteen (*G. mangostana*), walnut (*C. ovatum*), mango (*M. indica* L), malay apple (*S. malaccense*) and pomelo (*C. maxima*) with a value of 1.96% each. The high frequency of presence of a species is due to habitat and environmental conditions that are suitable for the plant so that it can grow, develop and excel in competing well. Apart from its superiority in competing for space, nutrients and sunlight are also needed for its growth and development. If the frequency of a species is low then that type of plant grows in unsuitable habitat and environmental conditions (Rizky & Elza. 2016)

The highest dominance at the pole level is the langsat plant (*L. domesticum* Corr) with a value of 70.11% and the lowest dominance is the pomelo (*C. maxima*) 0.02%. The largest number of individuals is the type most present in an area. The type that is most present indicates that this type is the most dominant species in that area. The presence of a type of plant in a particular area shows the plant's ability to adapt to environmental conditions. The dominance value of a plant type can provide an idea of the level of control of an area by each type of plant. According to Arrijani (2008), the species that dominates an area is defined as a species that has great adaptability and tolerance to environmental conditions. Then the low dominance value is because this species is unable to adapt to its environment and cannot compete with other plants.

The overall results of the calculation can be seen in the Important Index Value (IIV). The highest INP at the pole level is the langsat plant (*L. domesticum* Corr) with a value of 125.82% and the lowest is the pomelo plant (*C. maxima*) with a value of 2.79%. The IIV of a species in a community is a parameter for determining the level of role of that species in its community (Ismail et al, 2017). The greater the INP value of a species, the greater its control over the community and vice versa. Control of a species in a habitat indicates that the species can utilize most of the resources in the surrounding environment (Ismaini et al, 2015). Thus, it can be said that langsa plants can utilize most of the resources in the surrounding environment and dominate the community of local fruit producing plants with economic value at the pole level in Uraur Village.

Table 4. Relative Density, Relative Frequency, Dominance of Relative and Important Index Value of Plants Producing Fruit at Tree Level with Economic Value in Uraur Village

English Name	Species	RD (%)	RF (%)	DR (%)	IIV (%)
Durian	*Durio zibethinus* L	50.00	25.00	90.36	163.36
Walnut	*Canarium ovatum*	11.11	16.67	3.77	31.55
Kuweni	*Mangifera odorata*	5.55	8.33	1.14	15.02
Breadfruit	*Mangifera altilis*	5.55	8.33	1.14	15.02
Cempedak	*Artocarpus integer*	5.55	8.33	0.78	14.67
Malay apple	*Syzygium malaccense*	5.55	8.33	0.78	14.67
Cocoa	*Theombroma cacao* L	5.55	8.33	0.66	14.58
Langsat	*Lansium domesticum* Corr	5.55	8.33	0.66	14.58
Petai	*Parkia speciosa*	5.55	8.33	0.66	14.58
	Total	99.96	99.98	99.96	298.17

The calculation results in Table 4 above show that the type of plant at tree level with the highest density is durian (*D. zibethinus* L) with a value of 50%. Plants with low density values are cocoa (*T. cacao* L), langsat (*L. domesticum* Corr) and petai (*P. speciosa*) with values of 5.55% each. When compared with plants at pole level, the highest density at tree level is durian plants (*D. zibethinus* L). This indicates that previously in Uraur Village the type that was widely grown or planted was durian (*D. zibethinus* L). Durian (*D. zibethinus* L) had high economic value at that time. However, as time goes by, it is likely that many durian trees have been cut down by the community for wood or land needs. Table 3 shows that there are still durian plants at the pole level, but fewer than the langsat plants found in Table 2. It can be seen that there are more langsat plants at pole level compared to tree level.

The highest frequency value for tree level plants is durian plants (*D. zibethinus* L) with a value of 25% and tree level plants with the lowest values are cocoa (*T. cacao* L), langsat (*L. domesticum* Corr) and petai (*P. speciosa*) with each value of 8.33%. The high frequency value indicates that durian plants (*D. Zibethinus* L) have a wider distribution than other plant types, whereas cocoa, langsat and petai plants have a distribution that is not too wide compared to durian plants. This is what causes durian plants to have a high relative frequency. The highest dominance at tree level is durian (*D. zibethinus* L) with a value of 90.36% and at tree level with the lowest value is cocoa (*T. cacao* L), langsat (*L. domesticum* Coor) and petai (*P. speciosa*) 0.9%. According to Maisyaroh (2010), the existence of a dominant type can be influenced by several factors, including competition between existing plants, in this case related to the climate and minerals needed. If the climate and minerals needed are supportive then that type will be superior and more common.

The highest Importance Index Value (IIV) for tree-level plants is the durian plant (*D. zibethibus* L) with a value of 163.36%, while the plants with the lowest values are cocoa (*T. cacao* L), langsat (*L. domesticum* Corr), and pate (*P. speciosa*) with a value of 14.58% each. The greater the IIV value of a species, the greater its control over the community and vice versa. Control of a species in a habitat shows that the species can be utilized as a resource in the surrounding environment (Ismaini, 2016).

Diversity Index. The results of calculating the plant diversity index at pole level and tree level can be seen in **Table 5.**

Table 5. Fruit Plant Diversity Index at Pole Level and Tree Level

Parameter	Pole Level	Tree level
Diversity index value	2.17	1.17

The plant diversity index at pole level and tree level plants is classified as moderate, shown with a value of 1.17-2.17. This is because both levels have a neutral ecosystem, shown by the results of measuring environmental parameters which are classified as good for the growth of fruit plants in Uraur Village. The value of the diversity index for a species according to Shannon-Wiener is defined as a value of H' > 3 indicating that the diversity of species on a transect is highly abundant, a value of H' $1 \leq H' \leq 3$ indicates that the diversity of species on a transect is moderate and a value of H' < 1 indicates that the diversity of species on a transect is little or low. Even though it is classified as moderately diverse, these types of plants need to be maintained because they have economic value which provides income for the people of Uraur Village. Therefore, maintenance processes such as cleaning pest plants and applying fertilizer are necessary to provide maximum results and good quality.

Habitat for Fruit-Producing Plants in Uraur Village. Uraur Village is surrounded by hilly areas. Fruit plants planted not far from people's homes grow well in the area. The existence of rivers or small streams in hilly areas is a sufficient source of water for these plants. Apart from hilly areas, the growth of fruit plants in Uraur Village is also influenced by other physical and chemical environmental factors such as temperature, humidity, pH and light intensity. The results of measuring environmental parameters can be seen in **Table 6.**

Table 6. Results of environmental parameter measurements

No	Physical Chemical Environmental Factors	Values
1	Soil temperature (^{0}C)	28.4-32.16
2	Soil moisture (%)	12.5-25
3	pH	7
4	Air Temperature (^{0}C)	29-35
5	Air Humidity (%)	44-68
6	Light Intensity (Lux)	694 -1541

The results of measuring environmental parameters show that the soil temperature at the research location ranges between 28.4^{0}C-32.16^{0}C and the air temperature ranges between 29^{0}C-35^{0}C. Soil temperature and air temperature at the research location are good temperatures for plant growth. According to Meilianto et al, (2022) the optimal soil temperature for plants is in the range of 20^{0}C-35^{0}C. Soil moisture ranges from 12.5%-25%. The soil moisture value at the research location is included in soil moisture that is good for plant growth. This is in accordance with the opinion of Pradana et al, (2023) that soil moisture for plant growth ranges between 12%-40% because it falls within the normal value range. Air humidity ranges from 44%-68%. Optimal air humidity for plant growth is 50% -80% because humidity that is too high will cause pest attacks on plants. The soil pH value at the research location is 7.

The pH at the research location is a good value for plant growth. The optimum soil pH is 7. The light intensity ranges from 694-1541 Lux. Tri et al, (2010) stated that the high and low temperatures in an area are influenced by the length of sunlight and cloud cover. An area that has a high air temperature value if the sunlight is long and if the air temperature value is low then the sunlight is relatively short. Areas with a lot of cloud cover receive less sunlight, so heating is reduced and air temperatures fall. Humidity is influenced by several factors, including air temperature and sunlight. Minimum relative air humidity occurs shortly after the intensity of sunlight reaches its maximum, namely during the day, just as happens with air temperature when it reaches its maximum. This occurs because temperature has a very large influence on relative air humidity (Cahyaningpratiwi et al, 2021). Meanwhile, in the afternoon the intensity of sunlight decreases so that air humidity increases, because the air temperature decreases.

CONCLUSION

1. The plant habitat conditions in Uraur Village are suitable for the growth of fruit-producing plants. The geographical conditions and environmental parameters of Uraur Village support the growth of local fruit plants.
2. There are more types of pole level plants compared to tree level plants
3. Langsat plants (*L. domesticum* Corr) and durian (*D. zibethinus* L) are respectively plant types that dominate their communities at the pole and tree levels. The level of diversity of fruit-bearing tree species in Uraur Village is classified as moderate

AUTHORS CONTRIBUTION

K.A.K. designed and conducted the research, analysed and interpretation the data, and wrote the draft of manuscript. P.L. designed the research, analysed and interpretation the data, reviewed the draft of manuscript, and supervised all the process. E.T. designed the research, reviewed the draft of manuscript, and supervised all the process.

CONFLICT OF INTEREST

The authors declare no conflicts of interest, and will take full responsibility for the content of the article, including implications of AI-generated art.

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