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Diversity Biological Food in the Yards of the Skouw Village Community Muara Tami District

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Abstract: This research aims to analyze the value of the diversity of plant types in the yards of the people of Skouw Sae village, Muara Tami District, Jayapura City. Research data collection was carried out by surveying and analyzing yard plant vegetation. Biodiversity data were analyzed using PAST (Paleontological Statistics) software version 4.09. Analysis of yard plant vegetation in the people of Skouw Sae village, Muara Tami District, Jayapura City was obtained from 20 house yards and obtained 27 plant species which were distributed at almost all stations or planted in people's houses. There are 5 strata of food plant vegetation in people's yards with varying numbers of individuals. The first stratum consisted of 895 individuals, the second stratum 32 individuals, the third stratum 122 individuals, the fourth stratum 281 individuals, and the fifth stratum 570 individuals. If we look at the number of strata species, it is found that the first stratum consists of 12 species, the second stratum is 5 species, the third stratum is 10 species, the fourth stratum is 11 species, and the fifth stratum is 9 species. Overall, the diversity of food plants found in the yards of the people of Skouw Sae village can be categorized as moderate (H'= 1.49).

Keywords: Food security; Skouw sae; Strategy; Sustainable; Yard

Introduction

Environmental changes affect various aspects of life. Changes that occur in humans' living environment cause disturbances in their balance because some environmental components become less functional (Briffa et al., 2020; Amarya et al., 2018). Environmental changes can occur due to human intervention and can also occur due to natural factors (Prasad Bhatt, 2023; Muluneh, 2021). Current changes in forests and land are motivated by the high demand for consumption for food, clothing, and shelter (Wassie, 2020). The need for agricultural businesses and housing continues to increase over time, followed by high population growth (Rustiadi et al., 2021). Clearing forests and land for food is always inadequate because it is more oriented towards food production (Russo Lopes & Bastos Lima, 2022). On the other hand, the current food production does not have to be obtained from large areas of land, but small areas of land can be used to produce food so that it can meet current human needs (Giller et al., 2021). The use of narrow land is managed by planting economic crops that have high production value (Pawlak & Kołodziejczak, 2020).

Indonesia's population is ranked fourth in the world after China, India, and the USA. This also causes our food exports of rice and wheat from abroad to be quite high. The government is currently continuing to encourage rice production from time to time so that we become a food-sovereign country (Amirah Ajani Dzulhidany & Sigit Andhi Rahman, 2022; Firdaus et al., 2020). Current global conditions require technological innovation and optimal natural engineering to increase crop production (Chaudhary & Kumar, 2022; Dhanaraju

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et al., 2022). Utilizing yard land to develop economic crops can be done to meet the needs of people in villages or villages. It is known that although in our country the area of sea is dominant, the majority of Indonesian people depend on the land agricultural sector for their livelihood (Zerssa et al., 2021). Agricultural activities as part of society's contribution to food have not been able to answer the food problem as a whole and in fact, there is still a lack of independent food supply in our country.

For this reason, it is very important to develop a homestead study to find out how much diversity is valued by the people of Skouw Sae Village, Muara Tami District, Jayapura City as an alternative to the national food security strategy using an agricultural intensification approach.

Method

Time and Place of Research

The research is planned to be carried out in Skouw Sae Village, Muara Tami District, Jayapura City which can be shown in Figure 1. The research will be carried out for 4 months, namely from February-July 2023.

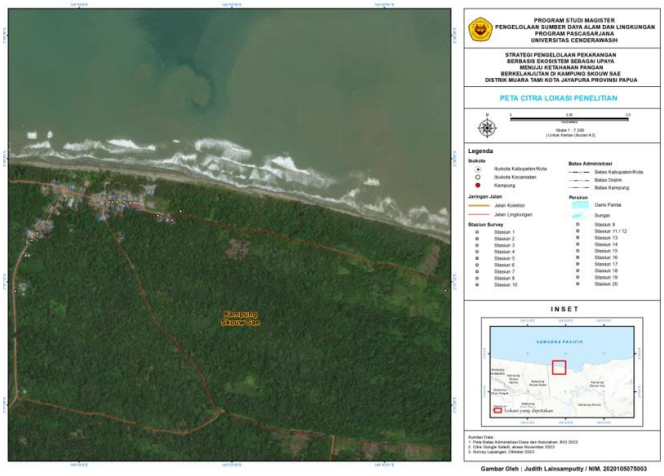

Figure 1. Map of research locations

Tools and Materials

The equipment and materials used in this research were a digital camera, ballpoint pen, field book, data board, 2B pencil, GPS, cellphone, and plant identification book.

Method of Collecting Data

Research data collection was carried out in 20 house yards of the people of Skouw Sae village to see horizontal and functional diversity. Measurements of vertical diversity were carried out around the sample villages (front, side, and back yards). Apart from the data on the average size of yards in Muara Tami District, Jayapura City, there is also another unique feature in this research, namely: the vertical diversity of yard plants. Each sample household also shows different plant diversity for each type of plant in their yard. Vertical yard diversity is meant by a form of diversity based on the stratification of plants (height) that people plant around their yard. Then a vegetation analysis is carried out per yard unit. (Sutomo & Van Etten, 2023); grouped plants into 5 strata, namely: stratum V is trees > 10 m tall; stratum IV is small trees or large shrubs 5-10 m, stratum III is small shrubs, shrubs 2-5 m, stratum II is shrubs and stratum I is herbs, grass <1 m.

Data Analysis

The yard data analysis method is a method of analyzing yard vegetation by first identifying the species and family of the plants. Next, measure the area of the yard (number of individuals, families, strata, function or use, and location found) (Lin et al., 2023). The data were then tabulated and analyzed using PAST (Paleontological Statistics) software version 4.09 (Majaneva et al., 2018).

Result and Discussion

Analysis of yard plant vegetation in the Skouw Sae village community, Muara Tami District, Jayapura City, obtained from 20 community home gardens which are then referred to as research stations, can be shown in Table 1. From the 20 research stations, 27 plant species were obtained which were distributed in almost all stations or planted in community homes.

Table 1. Total Number of Yard Plant Species Consumed by the People of Skouw Sae Village, Muara Tami District, Jayapura City

Species Name
Alpinia galanga (L.) Willd.
Annona muricata L.
Areca catechu L.
Artocarpus altilis L.
Averrhoa carambola L.
Capsicum frutescens L.
Citrus aurantiifolia S.
Cocos nucifera L.
Cucurbita moschata Durch.
Curcuma longa L. syn.
Curcuma domestica Val.
Cymbopogon citratus L.
Dimocarpus longan Lour.
Flacourtia inermis Roxb.
Lansium domesticum Corr.
Mangifera indica L.
Metroxylon sagu Rottb.
Muntingia calabura L
Musa paradisiaca L.
Nephelium lappaceum L.
Ocimum basilicum L.

Species Name
Piper betle L.
Pometia pinnata L.
Psidium guajava L.
Saccharum edule Hassk.
Syzygium aqueum L.
Vigna unguiculata ssp. s*esquipedalis* (L.) Verdc.

Types of garden plants found at the research station include A. galanga (L.) Willd., A. muricata L., A. catechu L., A. altilis L., A. carambola L., C. frutescens L., C. aurantiifolia S., C. nucifera L., C. moschata Durch., C. longa L. syn., C. domestica Val., C. citratus L., D. longan Lour., F. inermis Roxb ., L. domesticum Corr., M. indica L., M. sago Rottb., M. calabura L, M. paradisiaca L., N. lappaceum L., O. basilicum L., P. betle L., P .pinnata L., P. guajava L., S. edule Hassk., S. aqueum L., and V. unguiculata ssp. sesquipedalis (L.) Verdc. Several species of garden plants are identical to the results of research conducted by (Sarimole & Rosiana, 2022), who found two types of garden plants developed by the Skouw Sae community as perennials, namely areca nut (A. catechu L.) and (C. nucifera L.), that Pinang (A. catechu L.) was developed or planted Skanto District, Keerom Regency.

Table 2. Location and Distribution of Food Plants in the Home Yards of the People of Skouw Sae Village

th house	Area (m ²)	Coordinates/Altitude	Focus Zone	Local Name	Species
		Near the beach (± 50 – 100 m)			
1	2500	S 02°37'03.5"	Front	Betel nut	*Areca catechu* L.
		E 140°53'21.7"	Right	Coconut	*Cocos nucifera* L.
		31 meters above sea level	Left	Mango	*Mangifera indica* L.
			Behind	Cherry	*Muntingia calabura* L
				Guava	*Psidium guajava* L.
				Water apple	*Syzygium aqueum* L.
				Breadfruit	*Artocarpus altilis* L.
				Matoa	*Pometia pinnata* L.
				Star fruit	*Averrhoa carambola* L.
				Rica	*Capsicum frutescens* L.
2	2500	S 02°37'04.2"	Front	betel nut	*Areca catechu* L.
		E 140°53'21.0"	Right	Coconut	*Cocos nucifera* L.
		33 meters above sea level	Left	Serei	*Cymbopogon citratus* L.
			Behind	Lime	*Citrus aurantiifolia* S.
				Basil	*Ocimum basilicum* L.
				Breadfruit	*Artocarpus altilis* L.
				Star fruit	*Averrhoa carambola* L.
				Guava	*Psidium guajava* L.
				Water apple	*Syzygium aqueum* L.
3	1000	S 02°37'02.9"	Front	betel nut	*Areca catechu* L.
		E 140°53'19.9"	Right	Coconut	*Cocos nucifera* L.
		31 m	Left	Lime	*Citrus aurantiifolia* S.
			Behind	Serei	*Cymbopogon citratus* L.
				Basil	*Ocimum basilicum* L.
				Water apple	*Syzygium aqueum* L.
				Breadfruit	*Artocarpus altilis* L.
				Guava	*Psidium guajava* L.
4	1000	S 02°37'01.2"	Behind	betel nut	*Areca catechu* L.
		E 140°53'15.9"		Breadfruit	*Artocarpus altilis* L.
		31 m		Lime	*Citrus aurantiifolia* S.
				Coconut	*Cocos nucifera* L.
				Serei	*Cymbopogon citratus* L..
5	1000	S 02°37'01.2"	Front	Longan	*Dimocarpus longan* Lour.
		E 140°53'15.4"	Right	Lime	*Citrus aurantiifolia* S.
		17 meters above sea level	Left	betel nut	*Areca catechu* L.
			Behind	Breadfruit	*Artocarpus altilis* L.
				Coconut	*Cocos nucifera* L.
6	1000	S 02°37'01.0"	Front	Lime	*Citrus aurantiifolia* S.
		E 140°53'15.2"	Behind	betel nut	*Areca catechu* L.
		16 meters above sea level		Coconut	*Cocos nucifera* L.
7	1000	S 02°37'00.7"	Front	Betel	*Piper betle* L.
		E 140°53'14.2"	Right	Guava	*Psidium guajava* L.

th house	Area (m ²)	Coordinates/Altitude	Focus Zone	Local Name	Species
		16 meters above sea level	Behind	Lime	*Citrus aurantiifolia* S.
				betel nut	*Areca catechu* L.
				Breadfruit	*Artocarpus altilis* L.
				Coconut	*Cocos nucifera* L.
8	1000	S 02°37'01.0"	Behind	betel nut	*Areca catechu* L.
		E 140°53'14.2"		Coconut	*Cocos nucifera* L.
		16 meters above sea level			
9	1000	S 02°37'00.6"	Front	Guava	*Psidium guajava* L.
		E 140°53'13.1"	Right	Water apple	*Syzygium aqueum* L.
		16 meters above sea level	Left	Lime	*Citrus aurantiifolia* S.
			Behind	Serei	*Cymbopogon citratus* L.
				Cherry	*Muntingia calabura* L.
				betel nut	*Areca catechu* L.
				Coconut	*Cocos nucifera* L.
10	1000	S 02°37'01.0"	Front	betel nut	*Areca catechu* L.
		E 140°53'13.6"	Behind	Jump	*Lansium domesticum* Corr.
		16 meters above sea level		Coconut	*Cocos nucifera* L.
				Mango	*Mangifera indica* L.
11	2500	S 02°37'13.3"	Front	betel nut	*Areca catechu* L.
		E 140°53'00.2"	Right	Coconut	*Cocos nucifera* L.
		28 meters above sea level	Left	Cherry	*Muntingia calabura* L.
			Behind	Summer squash	*Cucurbita moschata* Durch.
				Soursop	*Annona muricata* L.
				Sago	*Metroxylon sago* Rottb.
				Water apple	*Syzygium aqueum* L.
12	2500	S 02°37'13.3"	Front	Piang	*Areca catechu* L.
		E 140°53'00.2"	Right	Breadfruit	*Artocarpus altilis* L.
		28 m	Left	Betel	*Piper betle* L.
			Behind	Guava	*Psidium guajava* L.
				Coconut	*Cocos nucifera* L.
				Serei	*Cymbopogon citratus* L.
				Long beans	*Vigna unguiculata* ssp. s *esquipedalis* (L.) Verdc.
				Sago	*Metroxylon sago* Rottb.
				Banana	*Musa paradisiaca* L.
				Sugarcane	*Saccharum edule* Hassk.
13	5000	S 02°37'13.2"	Front	betel nut	*Areca catechu* L.
		E 140°53'59.4"	Right	Coconut	*Cocos nucifera* L.
		17 m	Left	Banana	*Musa paradisiaca* L.
			Behind	Sago	*Metroxylon sago* Rottb.
				Water apple	*Syzygium aqueum* L.
				Guava	*Psidium guajava* L.
14	5000	S 02°37'08.4"	Front	betel nut	*Areca catechu* L.
		E 140°53'01.6"	Right	Coconut	*Cocos nucifera* L.
		21 m	Left	Mango	*Mangifera indica* L.
			Behind	Betel	*Piper carved* L.
				Lime	*Citrus aurantifolia* S.
				Turmeric	*Curcuma longa* L. syn. *Curcuma domestica* Val.
					Curcuma longa L. syn. *Curcuma domestica* Val.
				Matoa	*Pometia pinnata* L.
15	2500	S 02°37'0	Front	betel nut	*Areca catechu* L.
		E 140°53'0	Right	Tomi-tomi	*Flacourtia inermis* Roxb.
		21 m	Left	Coconut	*Cocos nucifera* L.
			Behind	Galangal	*Alpinia galanga* (L.) Willd.
				Rica	*Capsicum frutescens* L.
				Lime	*Citrus aurantiifolia* S.

th house	Area (m ²)	Coordinates/Altitude	Focus Zone	Local Name	Species
16	5000	S 02°37'06.3"	Front	betel nut	*Areca catechu* L.
		E 140°53'02.3"	Right	Cherry	*Muntingia calabura* L.
		24 meters above sea level	Left	Lime	*Citrus aurantiifolia* S.
			Behind	Coconut	*Cocos nucifera* L.
				Guava	*Psidium guajava* L.
				Water apple	*Syzygium aqueum* L.
17	2500	S 02°37'06.3"	Front	betel nut	*Areca catechu* L.
		E 140°53'02.5"	Right	Rambutan	*Nephelium lappaceum* L.
		24 meters above sea level	Left	Rica	*Capsicum frutescens* L.
			Behind	Coconut	*Cocos nucifera* L.
				Betel	*Piper betle* L.
				Galangal	*Alpinia galanga* (L.) Willd.
				Breadfruit	*Artocarpus altilis* L.
				Matoa	*Pometia pinnata* L.
18	2500	S 02°37'05.2"	Front	Galangal	*Alpinia galanga* (L.) Willd.
		E 140°53'03.3"	Right	betel nut	*Areca catechu* L.
		14 meters above sea level	Left	Guava	*Psidium guajava* L.
			Behind	Lime	*Citrus aurantiifolia* S.
				Mango	*Mangifera indica* L.
				Water apple	*Syzygium aqueum* L.
19	2500	S 02°37'05.3"	Front	betel nut	*Areca catechu* L.
		E 140°53'03.2"	Right	Lime	*Citrus aurantiifolia* S.
		24 meters above sea level	Left	Guava	*Psidium guajava* L.
			Behind	Rica	*Capsicum frutescens* L.
				Water apple	*Syzygium aqueum* L.
				Coconut	*Cocos nucifera* L.
				Galangal	*Alpinia galanga* (L.) Willd.
				Breadfruit	*Artocarpus altilis* L.
				Serei	*Cymbopogon citratus* L.
				Basil	*Ocimum basilicum* L.
20	2500	S 02°37'01.1"	Front	Lime	*Citrus aurantiifolia* S.
		E 140°53'16.1"	Left	Cherry	*Muntingia calabura* L.
		15m	Right	betel nut	*Areca catechu* L.
				Coconut	*Cocos nucifera* L.

The existence of stations as research sites is located on the edge of the beach and also on land or far from the beach. Therefore, data collection was carried out for these two locations. Data collection on yard plants was carried out on the left, right, front and back sides of all houses as research stations. The types of garden plants in the stations as research locations were carried out in ten residents' houses with various types of plants. The first station found 10 (ten) species, where on the front side *A. catechu* L. was found, *M. calabura* L., *P. guajava* L., *S. aqueum* L., *A. altilis* L., *P. pinnata* L., *A. carambola* L., *C. frutescens* L., the right side of *C. nucifera* L. and the left of *M. indica* L. The second station found 9 (nine) species, where on the front side was found *A. catechu* L.; the back side found *C. aurantiifolia* S., *O. basilicum* L., *A. altilis* L., *A. carambola* L., *P. guajava* L., *S. aqueum* L.; the right side was found *C. nucifera* L., and the left side was found *C. citratus* L. The third station found 8 species, where on the front side were found *Areca catechu* L.; back side of *C. citratus* L, *O. basilicum* L., *S. aqueum* L., *As altilis* L. and *P. guajava* L.; right side found *C. nucifera* L.; On the sending side, *Cs aurantiifolia S was found. The fourth* station found 5 species, of which only a few species were found on the back side, namely *A. catechu* L., *A. altilis* L., *C. aurantiifolia* S., *C. nucifera* L., *C. citratus* L.

The fifth station found 5 species, where on the front side *Dimocarpus longan* Lour was found; right side found *C. aurantiifolia* S.; send side found *A. catechu* L.; the back side found *A. altilis* L., *C. nucifera* L. The *sixth station/house* found 3 (three) species, where on the front side *C. aurantiifolia* S. was found; the back side found *A. catechu* L., *C. nucifera* L. The *seventh station* found 6 (six) species, where on the front side *P. betle* L. was found; right side found *P. guajava* L.; on the back side of *C. aurantiifolia* S., *A. catechu* L., *A. altilis* L., *C. nucifera* L. The eighth station found 2 (two) species, where only on the back side were *A. catechu* L. and *C. nucifera* L. The *ninth* station found 7 species, where on the front side *P. guajava* L. was found; right side found *S. aqueum* L; left side found *C. aurantiifolia* S.; the back side found *C. citratus* L., *M. calabura* L., *A. catechu* L., *C. nucifera* L. Stasius found 4 (four) species, where on the front side found *A. catechu* L.; on the back side were found *L. domesticum* Corr., *C. nucifera* L., *M. indica* L.

Meanwhile, plant species located at research stations far from the coast were obtained in 10 (ten) community house yards which could then be explained for all sides of the house. In the *eleventh* station, species were found, *A. catechu* L. was found on the front side; right side found *C. nucifera* L.; left side found *M. calabura* L .; on the back side found *C. moschata* Durch., *A. muricata* L., *M. sago* Rottb., *S. aqueum* L. Stasius found 11 (eleven) species, where on the front side found *A. catechu* L.; right side found *A. altilis* L.; left side found *P. betle* L.; on the back side were found *P. guajava* L., *C. nucifera* L., *C. citratus* L. , *V. unguiculata* ssp. s *esquipedalis* (L.) Verdc., *M. sago* Rottb., *M. paradisiaca* L., *S. edule* Hassk. Stasius found 6 species, where on the front side found *A. catechu* L.; right side found *C. nucifera* L.; left side found *M. paradisiaca* L.; the back side found *M. sago* Rottb., *S. aqueum L. The fourteenth* station found 8 (eight) species, where on the front side found *A. catechu* L.; right side found *C. nucifera* L.; left side found *M. indica* L.; the back side found *P. betle* L., *C. aurantiifolia* S., *C. domestica* Val., *P. pinnata* L. Stasius found 6 species, where on the front side found *A. catechu* L.; right side found *F. inermis* Roxb.; left side found *C. nucifera* L.; the back side found *A. galanga* (L.) Willd., *C. frutescens* L., *C. aurantiifolia S. The sixteenth* station found 6 species, where on the front side were found *Areca catechu* L.; *the* right side was found *M. calabura* L.; left side found *C. aurantiifolia* S.; and *the* back side was found *Cs nucifera* L., *P. guajava* L. and *S. aqueum* L.

Stasius found 8 species, where the front side was found *A. catechu* L.; right side found *N. lappaceum* L.; left side found *C. frutescens* L.; and on the back side were found *C. nucifera* L., *Pr betle* L., *As altilis* L., and *P. pinnata* L. The eighteenth station found 6 species, where on the front side *Alpinia galanga* (L.) Willd was found.; right side found *A. catechu* L.; left side found *P. guajava* L.; and on the back side were found *M. indica* L., *S. aqueum L.* The nineteenth station found 10 (ten) species, where on the front side *Aa catechu* L. was found; right side found *C. aurantiifolia* S.; left side found *C. frutescens* L.; and the back side found *C. frutescens* L., *S. aqueum* L., *C. nucifera* L., *A. galanga* (L.) Willd., *A. altilis* L., *C. citratus* L. , *O. basilicum* L. Station In the *twentieth* house, 4 (four) species were found, where on the front side *C. aurantiifolia* S. was found; left side found *M. calabura* L ; and on the right side were found *A. catechu* L. and *C. nucifera* L.

Of the number of plant types developed by the people of Skouw Sae village as shown in Appendix 1, if you look closely, the various plant types are divided into various families. Of the 27 species found at the research location, they are divided into 20 families, of which Arecaceae has 3 (three) species, including *A. catechu* L., *C. nucifera* L., *M. sago* Rottb., and Sapindaceae consist of 3 (three) species including *P. pinnata* L., *D. longan* Lour., *N. lappaceum* L., which can be shown in Table 2. These two families have a more dominant number of species compared to the others.

Meanwhile, there are 3 species that have a higher number of individuals compared to other species. The three species include *A. catechu* L., (1194 individuals), *C. nucifera* L., (259 individuals) and *C. frutescens* L., (117 individuals) which can be shown in Figure 2.

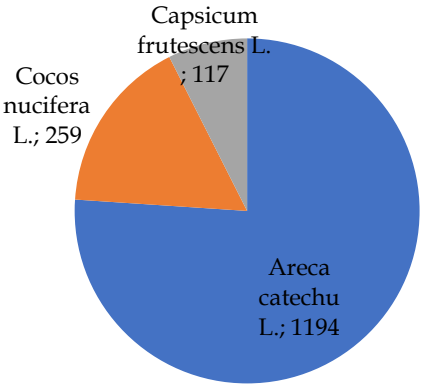

Figure 2. Three species that have a dominant number of individuals

Important Value Index (INP)

Apart from the number of individuals dominated by certain species, there are also species that have the highest Importance Value Index (INP) compared to other species. There are 5 (five) species that have the highest INP, including *A. catechu* L., (80.91), *C. nucifera* L., (41.77), *L. domesticum* Corr. (20.76), *A. altilis* L., (20.21), *P. pinnata* L., (13.40) shown in Figure 3.

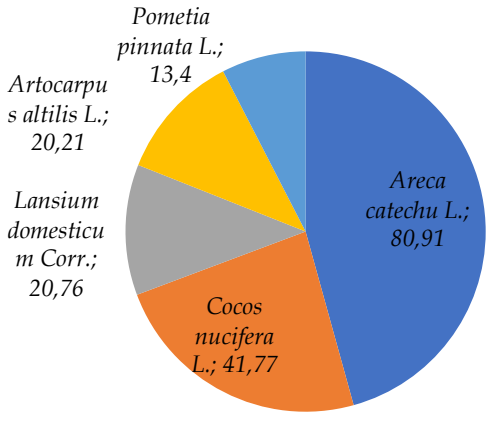

Figure 3. Five species that have the highest INP

The importance value index (INP) is an indicator to determine the role of species in a community. INP is the sum of relative density, relative frequency and relative

dominance. The greater the importance value index value, the greater the role of the species in the community, and vice versa (Laurila-Pant et al., 2015; Divakara et al., 2022). Meanwhile, according to Fatlan et al. (2021) and Widiyawati et al. (2023), the important Value Index (INP) is an index that is calculated based on the number obtained to determine the level of species dominance in a plant community. The difference in the important value index is due to competition between each species to obtain nutrients and sunlight at the research location (Thammanu et al., 2021; Dormann et al., 2020).

The magnitude of the important value index (INP) shows the role of the species in the community or at the research location. Types *A. catechu* L., *C. nucifera* L., *L. domesticum* Corr., *A. altilis* L., *P. pinnata* L., are the five types that dominate because has the highest important index value. These five types are the dominant types in the ecosystem, especially in the yard House the people of Skouw village Sae Muara Tami District, Jayapura City. Dos Anjos et al. (2023), Akhrianti et al. (2020), and Oliveira et al. (2022), explain that species that have a large (dominant) role in the community will have a high INP . In Figure 4.2, it can be seen that *the A. catechu* L type has the highest INP and role compared to other types (Meutia Sari et al., 2017). Figure 4.2 shows that using only one relative value cannot be used to determine whether the role of one type is greater than another. So dominance based on INP provides more information when compared to dominance that only uses one relative value. This is in accordance with what was stated by Madley-Dowd et al. (2019) and Jeong et al. (2018) that the use of one relative parameter only provides limited information.

Summed Dominance Ratio (SDR)

If analyzed to see the SDR (*Summed Dominance Ratio*) value, it shows that there are 5 (five) that have a more dominant SDR value compared to the others. The five plant species include *A. catechu* L., (27.0), *C. nucifera* L., (41.77), *L. domesticum* Corr., (20.76), *A. altilis* L., (20.21), *P. pinnata* L., (13.40) which can be shown in Figure 4. This shows that these five plants dominate all house yards in Skouw Sae village because they have high adaptability to a variety of plants. The dominance of these five species is caused by several factors, one of which is that these species are plants developed by people in their gardens. Areca nut is one of the leading and priority commodities for society and continues to be developed because it has very high economic potential.

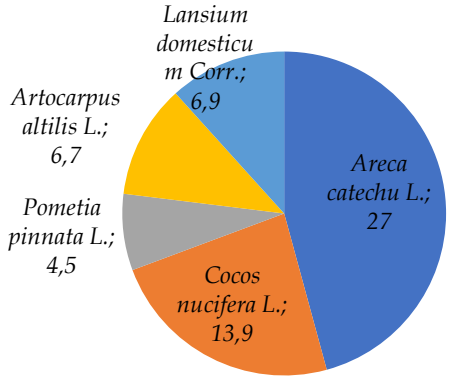

Figure 4. Five species that have more dominant SDR values

Diversity (H')

The diversity value of garden plants in the Skouw Sae village community can be shown in Figure 5, where there are 5 (five) species that have a higher diversity index compared to other species. The five species include *A. catechu* L., (H'= 0.29), *C. nucifera* L., (H'=0.27), *C. frutescens* L., (H= 0.17), *C. citratus* L., (H'= 0.14), *O. basilicum* L., (H'= 0.08). If analyzed as a whole to see the value of the diversity of food plants found in the yards of the people of Skouw Sae village, it can be categorized as *moderate* (H'= 1.49).

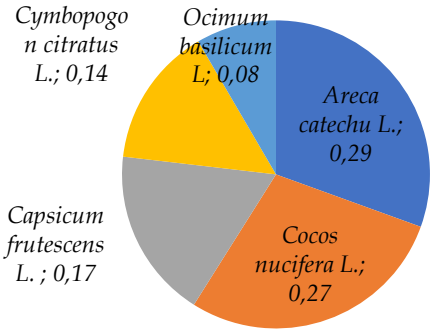

Figure 5. Five species that have more dominant H' values

The diversity index value describes the condition of food plants developed in community gardens (Korpelainen, 2023). Species diversity is a community level characteristic and is also used to express community structure (Wei et al., 2024). Ecologically, a community with a diversity index that has a high value can be said to mean that this type of community has the same or almost the same species abundance (Roswell et al., 2021). This species diversity index can also be used to assess the presence of pressure by humans (Díaz et al., 2020). The diversity index value is used to describe the state of the environment based on its biological conditions (Travlos et al., 2018). High species diversity

reflects high productivity, balanced ecosystem conditions, and reciprocal relationships between the flora and fauna within it (Correia & Lopes, 2023).

Level

The first layer consists of 12 (duabelas) species including *Areca catechu* L. (600 individuals), *Cocos nucifera* L (7 individuals), *Capsicum frutescens* L. (117 individuals), *Cymbopogon citratus* L (83 individuals), *Ocimum basilicum* L (40 individuals), *Piper betle* L. (4 individuals), *Cucurbita moschata* Durch. (2 individuals), *Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdc. (20 individuals), *Musa paradisiaca* L (5 individuals), *Curcuma longa* L. syn. *Curcuma domestica* Val. (3 individuals), *Alpinia galanga* (L.) Willd. (14 individuals that can be shown in Figure 6.

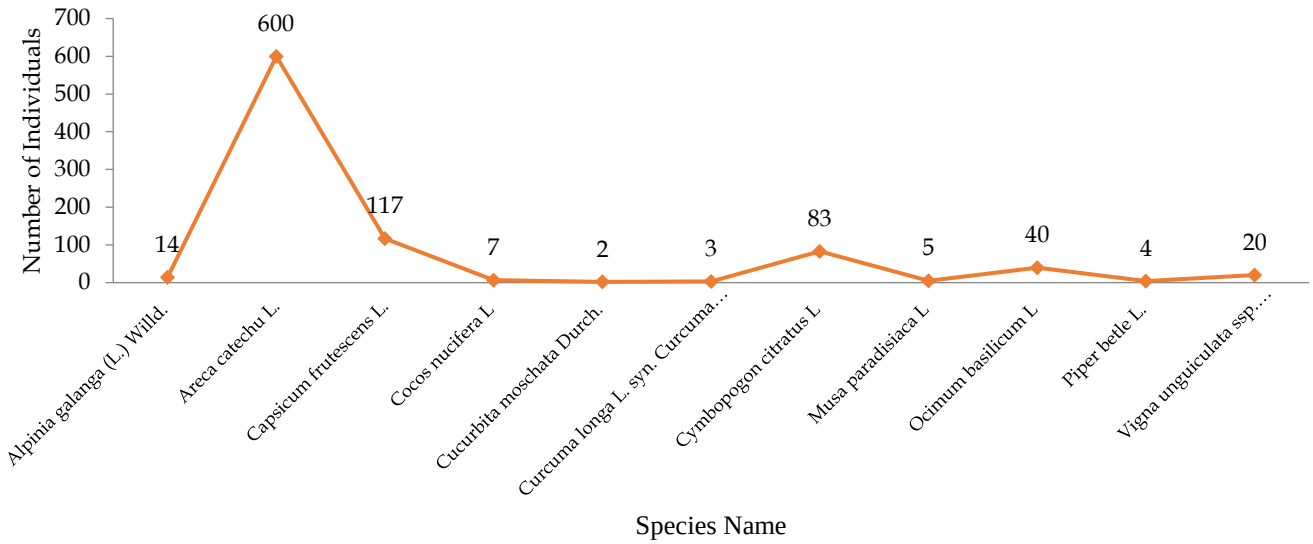

Figure 6. Number of species in the first strata

The second stratum consists of 5 (five) species including *Areca catechu* L. (15 individuals), *Cocos nucifera* L. (5 individuals), *Mangifera indica* L. (3 individuals), *Psidium guajava* L. (7 individuals), *Musa paradisiaca* L. (2 individuals) can be shown in Figure 7.

The third stratum consists of 10 (ten) species including *Areca catechu* L. (45 individuals), *Cocos nucifera* L. (9 individuals), *Mangifera indica* L. (1 individual), *Muntingia calabura* L. (5 individuals), *Psidium guajava* L. (17 individuals), *Syzygium aqueum* L (3 individuals), *Cymbopogon citratus* L (10 individuals), *Citrus aurantiifolia* S (15 individuals), *Musa paradisiaca* L (16 individuals), *Flacourtia inermis* Roxb (1 individual) shown in Figure 8.

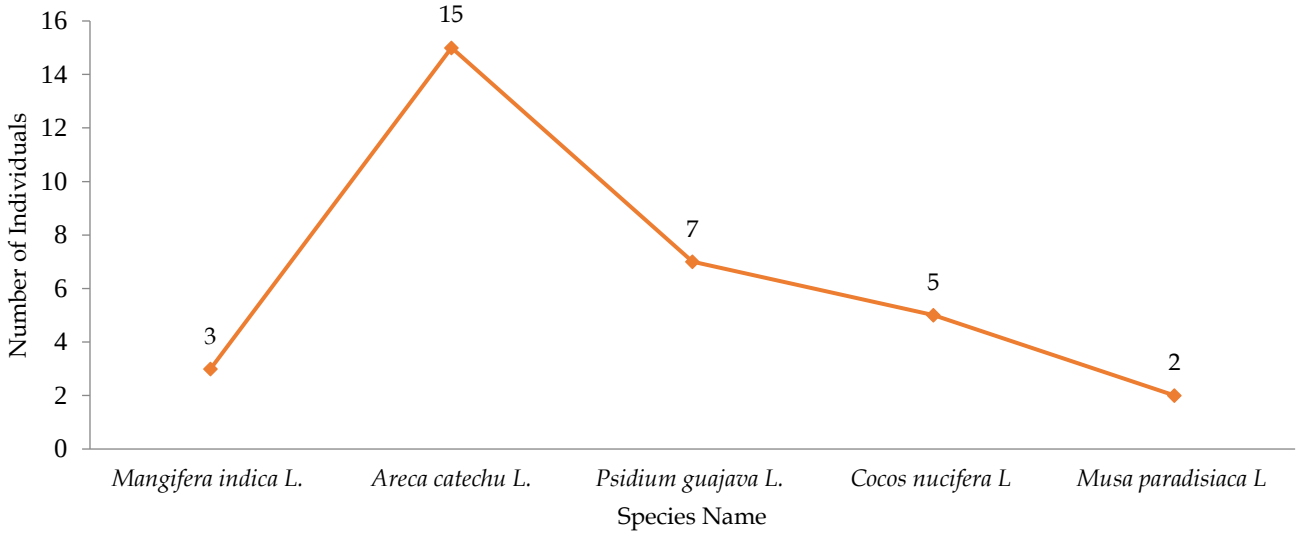

Figure 7. Number of species in the second strata

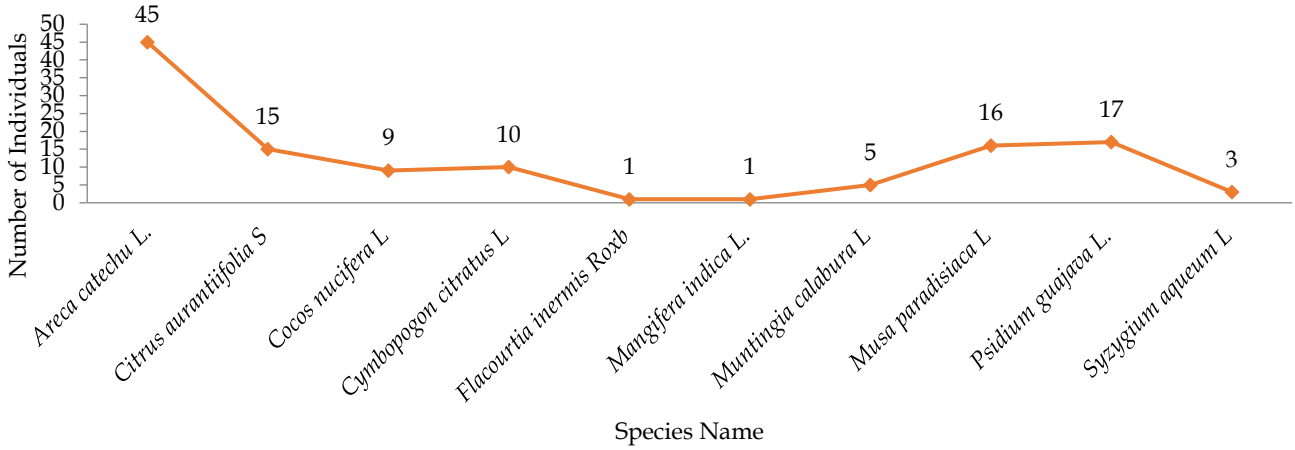

Figure 8. Number of species in the third strata

The fourth stratum consists of 11 (eleven) species including *Areca catechu* L (194 individuals), *Cocos nucifera* L (59 individuals), *Metroxylon sago* Rottb (9 individuals), *Pometia pinnata* L (2 individuals), *Dimocarpus longan* Lour (1 individual), *Nephelium lappaceum* L (1 individual), *Mangifera indica* L (2 individuals), *Syzygium aqueum* L (7 individuals), *Averrhoa carambola* L (4 individuals), *Lansium domesticum* Corr (1 individual), *Annona muricata* L (1 individual) shown in Figure 9.

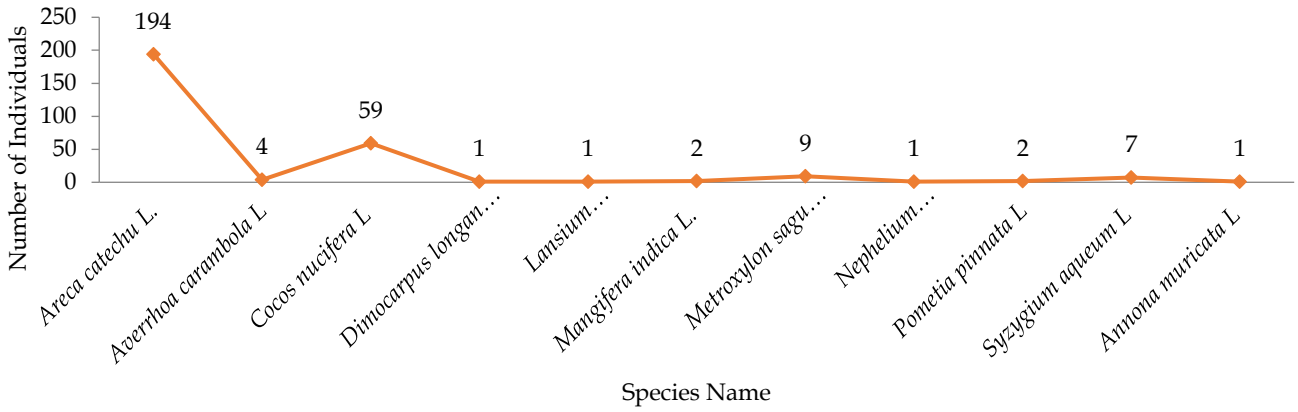

Figure 9. Number of species in the fourth strata

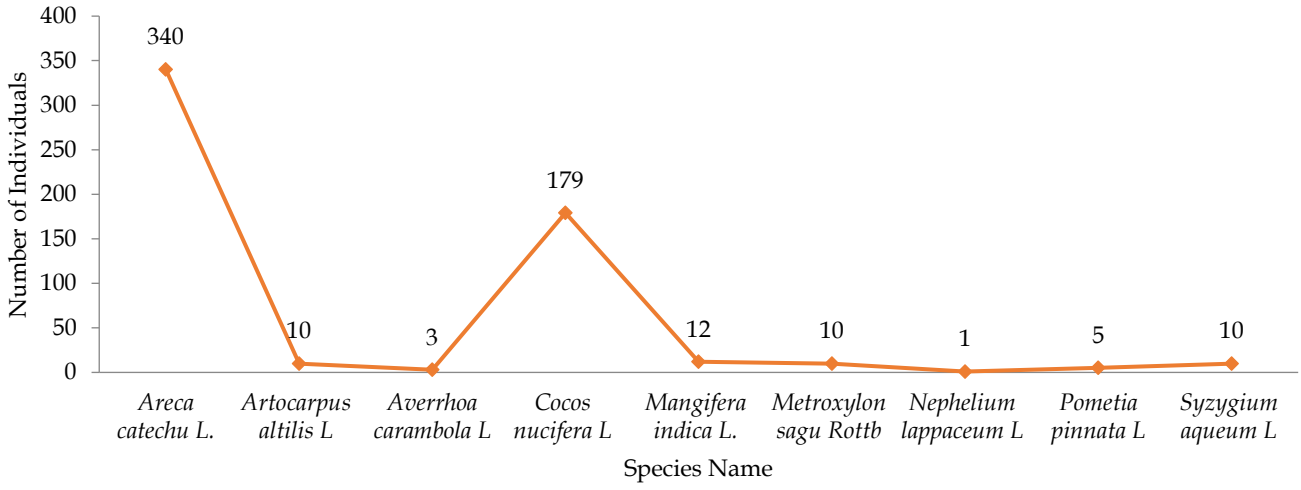

Figure 10. Number of species in the fifth strata

The fifth stratum consists of 9 (nine) species including *Areca catechu* L (340 individuals), *Cocos nucifera* L (179 individuals), *Metroxylon sago* Rottb (10 individuals), *Pometia pinnata* L (5 individuals), *Nephelium lappaceum* L (1 individual), *Mangifera indica* L (12 individuals), *Artocarpus altilis* L (10 individuals), *Syzygium aqueum* L (10 individuals), *Averrhoa carambola* L (3 individuals) are shown in Figure 10.

Food plants in the yards of the Skouw Sae community, Muara Tami District, Jayapura City are categorized into 5 strata vertically. Each stratum has a different number of individuals for all species. Strata I consists of (895 individuals), stratum II (32 individuals), stratum III (122 individuals), stratum IV (281 individuals) and stratum V (570 individuals). Strata I is the most dominant or has the largest number of individuals compared to the others, while the lowest and has the fewest individuals is stratum II, which can be shown in Figure 11.

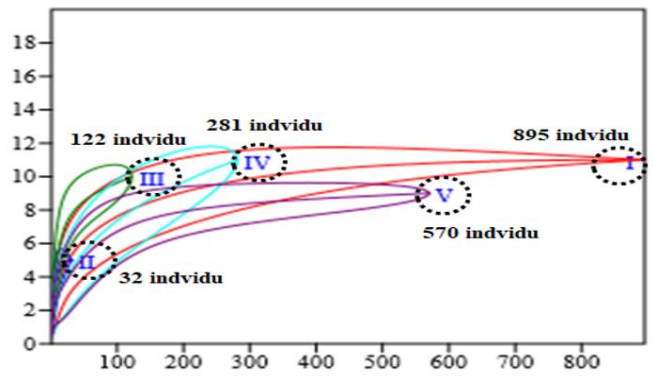

Figure 11. Total number of individuals in strata IV for all plant species at the research location

The garden plant that is more dominant and is located in all strata from I – V is Areca Palm. The stratum I category with height (< 1 m) consists of 600 individuals, stratum II (1m - 2m) consists of 15 individuals, stratum III (2m - 5m) consists of 45 individsuals, stratum IV (5m - 10m) consists of 194 individuals and stratum V (>10m) consisted of 340 individuals. This type is more dominant in all strata because it was developed or planted by the people of Skouw Sae village in each of their yards, and has even become a priority program for the village. This is in line with (Turner-Skoff & Cavender, 2019), that the large number of tree *species* planted in *yards is due to* a culture *of people* who like to plant various kinds of trees. Areca nut (*Areca catechu* L) is the dominant type planted by the Skouw Sae community because it has very high economic value. A type of plant will be planted in abundant quantities if it has high enough economic value (Schreinemachers et al., 2018). Apart from having high economic value, areca nut is dominantly developed because the Skouw Sae community also has a culture of eating areca nut like several communities in other tribes in Papua. Areca nut has become a tradition for the Papuan people in general, therefore it cannot be denied that areca nut is considered a cultural symbol, an important component or complement in traditional ceremonies or events. Pinang reflects the identity of the Papuan people, as well as being a symbol of solidarity and brotherhood, as something symbol honor and become tradition food daily Papuan people in general.

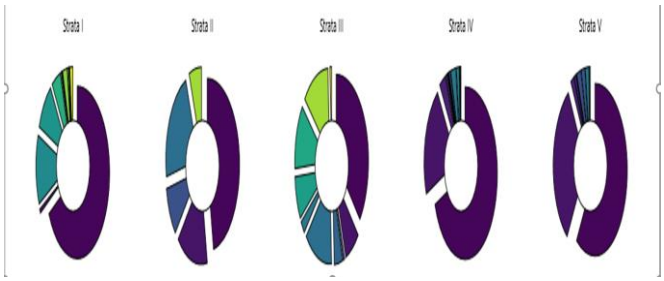

Figure 12. Diversity of food plant species differentiated by strata (plant height and number of individuals per species)

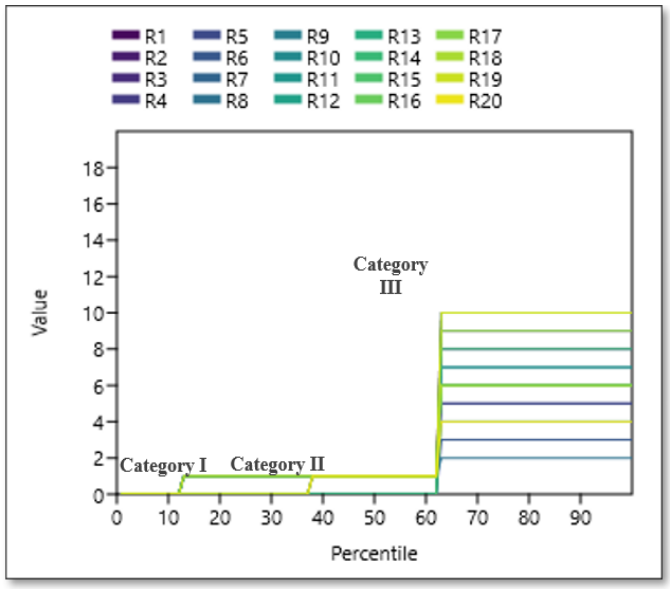

Figure 13. Percentiles plot, showing the use of house yards in the people of Skouw Sae Village, Muara Tami District, Jayapura City (R=0th House)

Analysis results utilization yard House based on percentile plots show comparison percentage of total utilization yard divided on three category based on frequency emergence (plant food, animals cattle small, and animal cattle large) in each location, that is category I, category II, and category III. Each category show exists significant difference based on percentage utilization of the total average area of each yard used house. Category III more significant (50% in R1, R2, R3, R7, R8, R11, R13, R14, R16, R19) however, no There is significant difference between category I (25% on R4, R5, R17, R18,

R20) and category II (25% on R6, R9, R10, R12, R15) which can show in Figure 13.

The results of the percentile plot analysis are sorted based on ranking (matrix transform convert to rank), showing that there are significant differences between food crops, small livestock and large livestock based on the total average ranking. Food crops had the highest ranking from the total sampling (R1–R20=3), small livestock had a ranking (R1–R20=1-1.5), and large livestock had a ranking (R1–R20=1.5-2). In particular, small livestock and large livestock do not have a significant difference between the two based on the average ranking because they have the same distribution pattern. However, there are differences when viewed based on the frequency of occurrence per sampling location, this is shown at sampling locations R4, R5, R17, R18, and R20 and can be shown in Figure 14.

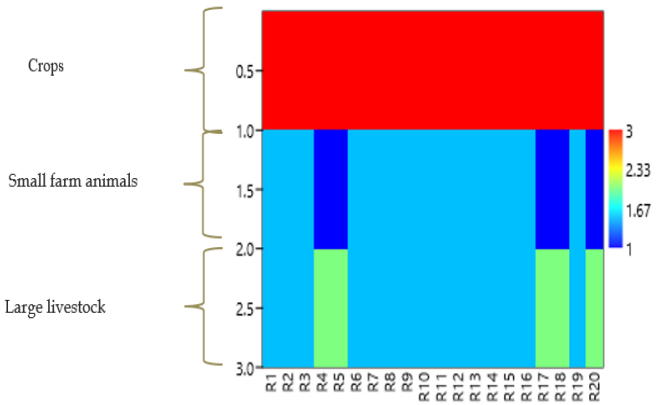

Figure 14. Plot matrix transform convert to rank, shows the comparison of the diversity of food plants, small livestock and large livestock in the home gardens of the people of Skouw Sae Village, Muara Tami District, Jayapura City (n=20; R=th House)

Yard Size

According to Arifin et al. (2008), yards are grouped into four categories. Small yard, if it has a green open space of less than 120 m². Medium yards have an area equal to 120 m ²-400 m². A large yard has an area ranging from 400 m ² – 1000 m². Yards with an area greater than 1000 m ² are called extra-large yards. Based on the explanation above, yards in the Skouw Sae village community can be categorized into large and extra-large yards. People's yards located on the beach are categorized as large and extra-large yards, while people's yards on the land side or far from the beach are categorized as extra-large yards. There are 8 (eight) community house yards on the beach or close to the beach categorized as large and 2 (two) categorized as extra large. Then there are 10 (ten) house yards which are far from the beach, all of which are categorized as extra large because they have an area of more than 100 m². House yards in the Skouw Sae village community are included in the large and extra large categories. The size of the yard allows various types of plants to be planted or developed so that the number of species, individuals and diversity is abundant or high. This is in line with (Avolio et al., 2020), that yards in rural areas generally have relatively large land sizes with a fairly high diversity of plant species. Galhena et al. (2013) said that generally the diversity of plants in the yard are types that are used to meet daily needs.

Conclusion

Utilization yard House based on percentile plots show comparison percentage of total utilization yard divided on three category based on frequency emergence (plant food, animals cattle small, and animal cattle large) in each location, that is category I, category II, and category III. The percentile plot analysis are sorted based on ranking (matrix transform convert to rank), showing that there are significant differences between food crops, small livestock and large livestock based on the total average ranking. The benefit of each community home yard is to plant all types of plants which are used to meet family needs such as fruit, vegetables and spices.

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Author Contributions
Investigation, J. L., B. T. R., and A. A. A..; formal analysis, J. L..; investigation, B. T. R and A. A. A.; resources, J. L and B. T. R.; data curation, B. T. R.: writing—original draft preparation, J. L and B. T. R.; writing—review and editing, A. A. A.: visualization, J. L, and A. A. A.; supervision, B. T. R.; project administration, D. S.; funding acquisition, A. A. A. and J. L. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest
The authors declare no conflict of interest.

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