Utilization of areca nut (*Areca catechu* L.) in the Skouw Yambe village community yard, Muara Tami sub district, Jayapura City, Papua Province, Indonesia

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Abstract. The biodiversity of plants has considerable functions and benefits for human life. Plants that are used generally grow outside and after being used they are then planted and cultivated by humans. One of the plants used and comes from the forest is the areca nut (*Areca catechu* L.). The use of plants in the yard has various functions and has economic value for the community. The purpose of this study was to examine the benefits of *A. catechu* grown in yards as an economic commodity for farmer households in Skouw Yambe Village, Muara Tami Sub District, Jayapura City, Papua Province, Indonesia. The method used in the present research was qualitative descriptive with the analysis technique of yard plant vegetation. The results showed that *A. catechu* has moderate biodiversity value (H '= 1.3-1.6) and has become a leading commodity in the yard for farmer households.
Key Words: homegarden biodiversity, areca nut potential, farmer household, yard diversity.

Introduction. The potential of plants in Papua is very abundant both in number and in types, including the areca nut (*Areca catechu* L.). *A. catechu* is a type of monocot plant that is widely used by the community and has high economic value. The type of land is also suitable for agricultural products development (Zahri 2018). For example, within agroforestry, *A. catechu* can be cultivated in the yard. Agroforestry techniques can increase farm household income (Linger 2014). As a plant that has economic potential, *A. catechu* grows and reproduces widely in Indonesia and especially in Papua. *A. catechu* is also a very popular herbal health plant used in Thailand (Wetwitayaklung et al 2006). *A. catechu* has economic value, because it was originally consumed by people on the coast of Papua. The current increase in *A. catechu* consumption is not only for coastal people but has spread evenly throughout Papuan society, both coastal communities and communities in the interior and in mountainous areas. It turns out that *A. catechu* has been used long before, where the leaves to the roots of the *A. catechu* are used in various human needs such as for household tools to use as a phytopharmaceutical plant (Zhou et al 2011). But, according to Mohri et al (2013) the yard is also traditionally able to maintain and protect ecosystems with high biodiversity, especially in the village's area, but is not necessarily able to change people participation from substantive agricultural activities towards commercial agriculture. Therefore, *A. catechu* can be planted in the yard to increase family income.

Potential for *A. catechu* in the city of Jayapura can be found in several villages and sub-districts with more of it found in community yards. For example, the yards in Skouw Yambe village are mostly planted in the backyard of the community's house. The fruit is used by the people in the village. Economically, it has great benefits for the community because it can be sold on the market and provides additional income for farmer households. As is the case in research that has been conducted in terms of using yards by the community in Kaimana, it is able to support the welfare of farmer households (Antoh et al 2019).

In the past, *A. catechu* was consumed mainly for traditional meetings with its function as a medium used in discussions to discuss customary issues in traditional houses. *A. catechu* is eaten with betel (*Piper betle* L.) and lime or a type of seashell that is burned and ashes taken and eaten together. Now the community has eaten *A. catechu* unlike usual in traditional events anymore. This is in culture for people who live in mountainous areas to plant more tubers and cassava in their yards (Antoh & Raunsay 2019). The increased consumption of *A. catechu* has resulted in a fairly competitive price in the market.

A. catechu grow naturally in nature and are easy to breed plants. Ecologically, *A. catechu* does not require special treatment to increase their growth rate. In fact, this plant is often used as a barrier to community gardens (Barlina 2007).

This study focuses more on how the community uses *A. catechu* as an economic crop that can be used as an alternative in improving farmer household welfare.

Material and Method. The present research was conducted in Skouw Yambe Village, Muara Tami District, Jayapura City, Papua Province, Indonesia (Figure 1), for five months, from May to September 2020.

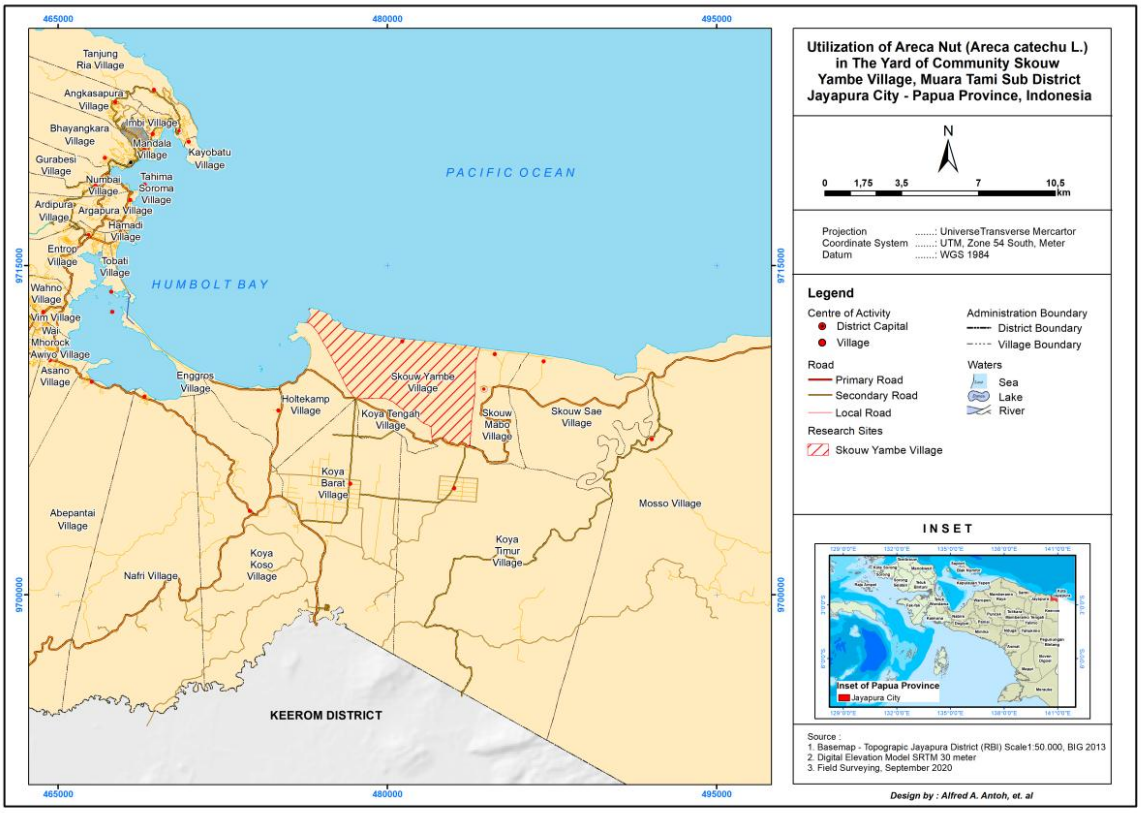

Figure 1. Map of data collection in Skouw Yambe Village, Muara Tami Sub District, Jayapura City, Papua Province, Indonesia.

The tools and materials used in this study were questionnaires, stationery, digital cameras, digital recorders, ropes, scissors, roller meters, cutting tools and plants found in the yard. The research was conducted using a qualitative descriptive method with the yard vegetation analysis technique. The research was conducted in two sample units, namely: neighborhood association.

Yard data analysis method is a yard vegetation analysis method by first identifying the species and family of the plant. Next measure is the the yard area evaluation (number of individuals, families, strata, functions or uses and location found) (Arifin et al 2012).

Agricultural biodiversity in the yard was evaluated according to Fachrul (2007):

a. Density $= \frac{\sum \text{ofwholeplants}}{\sum \text{ofwhole sampling units}}$

b. Relative density (%) $= \frac{\sum \text{individuals of species}}{\sum \text{individual of all species}} x\ 100$

c. Frequency $= \frac{\sum \text{sampling unit of species}}{\sum \text{whole sampling unit}}$

d. Relative frequency (%) $= \frac{\sum \text{frequency of species}}{\sum \text{frequency value for all species}}$ x 100

e. Dominance $= \frac{\sum \text{basal area of species}}{\sum \text{whole basalt}}$

f. Relative dominance (%) $= \frac{\sum \text{basal area of species}}{\sum \text{basal cover all types}}$ x 100

INP = KR + FR + DR
FR = relative frequency
KR = Relative density
DR = Relative dominance
INP = important value index

g. $\text{SDR} = \frac{\text{INP}}{3}$ x 100

$$H' = \sum_{i:1}^{S} pi \ln (pi)$$

Where:
H'= *Shannon-Wiener* biodiversity index
Pi = ni/n
ni= number of i-type individuals
n = Number of individuals
ln = Natural logaritm
s = Number of individuals

(Fachrul 2007):
H'>3 High abundant species diversity
H'1≤H' ≤3 Moderat abundant species diversity

Results and Discussion. The results of the study were shown through the analysis of the vegetation as a result of the potential for *A. catechu* to be very superior in the first and second sampling locations (Table 1).

Table 1
Dominant plant species in Skouw Mabo village, Muara Tami District, Jayapura City, Papua Province, Indonesia

RT location	*Average area (m^2)*	*INP*	*H'*	*SDR*	*Plants*	*Dominant species*	*Family*	*Level*	*Function*
1	3,741.9	68.2	1.3	62.2	Betel nut	*Areca catechu*	*Arecaceae*	V	Food (chewed like gums)
2	3,320.5	61.8	1.6	50.4	Betel nut	*Areca catechu*	*Arecaceae*	V	Food (chewed like gums)

RT - neighborhood association; INP = important value index; H' = Shanon-Wiener Index (diversity index); SDR = summed dominance ratio.

Areca plants found in yards with an average area of 3,741.9 m^2 were mostly found at the data collection sites. Almost all farmer households grow *A. catechu* in their yards. Whether planted in the front yard, side or backyard with an important value index of 68.2. However, the value of biodiversity was 1.3 with the value of the sum dominance ratio (SDR) of 62.2. This means that in all the farm households in Skouw Yambe Village, *A. catechu* are found.

For the second data collection site, *A. catechu* with an average yard area of 3,320.5 m^2 was found. The same aspect was observed in the two neighborhood units, namely the important value index of 61.8 with a moderate biodiversity value of 1.6 where the SDR value was 50.4. Pinang dominates the first location (RT1) and the second location (RT2) in the Skouw Yambe village.

It was found that there were many *A. catechu* around the people's home yards in Skouw Yambe village because they had high economic value. *A. catechu* can be sold for one bunch of mayang (local term) for 3.37 USD (lowest price), 33.78 USD (highest price). The price range for *A. catechu* depends on the weather or the season where in the summer there are few *A. catechu* found in trees so that the price of *A. catechu* can reach the highest price. However, when the rainy season arrives, many *A. catechu* are found so that the price can fall to reach the lowest price. The income earned is also determined by the size of the family member (Dirimanova 2018).

Therefore, *A. catechu* is important for residents of Skouw Yambe village and is often found in their yards. *A. catechu* can support the family's economy when they do not earn enough money from selling their agricultural products. *A. catechu* are also culturally linked to the people of the Skouw Yambe village but nowadays, have become a commercial crop in Papua and in Indonesia in general. Economic, social and ecological aspects of community sustainability are important to note (Antoh et al 2018). Planting *A. catechu* plants in yards to replace old plants is still rare. The regeneration of *A. catechu* plants takes place naturally in the community yards of the Skouw Yambe village. Other studies suggest that the composition and structure of plants in the yard need to be considered in terms of their function and use (Ogwu 2014). Efforts to plant *A. catechu* in the yards of the village community are currently important for economic sustainability but also for the preservation of the natural environment in the community yards of the Skouw Yambe village.

Conclusions. *A. catechu* need to be replanted in every community yard to maintain it so that the economic function continues, but also cultural and ecological functions, namely for the preservation of the natural environment. This is important for the sustainability of the community in managing natural resources, especially the use of *A. catechu* in community yards.

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