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Productivity of Local Food Commodities of Orang Asli Papua (OAP) Households in Bintuni Bay Regency

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A B S T R A C T

The availability of local staple foods can be seen from the level of production and productivity of local staple food commodities that are cultivated. This study was conducted to determine the level of productivity of local staple food crops of indigenous Papuan farmers in Teluk Bintuni Regency. The method used is a descriptive method with a case study technique. The case in this study is the productivity of local staple crops of indigenous Papuans (OAP) in Teluk Bintuni Regency. The data used are primary and secondary data. The number of samples in this study was 60 OAP farmers taken from villages in districts where the majority of the population is OAP, namely Manimeri, Bintuni, Tuhiba, Tembuni, Meyado, Yakora, Arandai, Tomu, Aroba and Sumuri Districts. Data analysis was carried out using descriptive statistical analysis. The measurement of productivity used was land productivity, namely by comparing the level of local staple food production with the area of land cultivated. The results showed that taro productivity was 0.23 tons/ha, cassava was 0.39 tons/ha, and sweet potatoes were 0.13 tons/ha. If seen, the level of productivity of local staple crops cultivated by OAP farmers is relatively low. There needs to be intensive efforts to increase the productivity of local staple foods

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INTRODUCTION

In addition to contributing to supporting national development, the agricultural sector also plays an important role regionally and locally in the progress of regional development, including supporting regional economic growth (Rojun & Nadziroh, 2020), providing employment, overcoming the food crisis through food availability, and supporting food security and resilience (Yusuf & Usman, 2022; Widiastuti & Himawan, 2021; Akzar et al., 2020; Imelda et al., 2017). The role of the agricultural sector as stated above needs to be supported, one of which is through the development of food source commodities consisting of introduced commodities from abroad and local food commodities.

The development of local food commodities hierarchically provides support for food security conditions in a region nationally, regionally, and locally. Food security conditions can be achieved, one of which is through the development of local food source commodities (Partini & Sari, 2022). This is because local food commodities are found throughout Indonesia so that they can guarantee the availability of their production (Muksin et al. 2022; Yusuf & Usman, 2022). In addition, the production of local food source commodities has a short trade chain (Cappelli et al., 2022; Kwil et al., 2020), grows according to local agro-ecological conditions, and is in accordance with the farming culture of the local community (Akzar et al., 2020; Yuwono, 2019).

Teluk Bintuni Regency is one of the regencies in West Papua Province which is a district that was split from Manokwari Regency in 2002. The development of Teluk Bintuni Regency as a district has encouraged increased economic activity in this area. The increasing population growth and economic growth of Teluk Bintuni Regency will affect the increase in demand/consumption of food, as also stated by Drago et al., (2020) that local food makes a real contribution to the sustainability of development in a region. Agricultural commodities in the food crop sub-sector as a local food source that have been cultivated by farmers in Teluk Bintuni Regency consist of lowland rice, dryland rice, corn, soybeans, green beans, peanuts, cassava, sweet potatoes, and taro (BPS, 2023). Meanwhile, other local food sources in the form of sago are spread across coastal and lowland areas which are sago forests with utilization to meet household needs and tuber commodities such as taro are cultivated by farmers in the highlands also on a household business scale. Data from the Central Statistics Agency of Teluk Bintuni Regency in 2023 shows that local food commodities such as Cassava, Sweet Potatoes, and Taro are cultivated in almost all district areas with varying levels of production. Meanwhile, the production of introduced local food commodities such as rice and nuts is only cultivated in several district areas. The unavailability of food data, especially local food, greatly affects local governments, especially related agencies, in designing and implementing agricultural development programs, especially the development of local food source commodities.

Local food source commodities themselves are cultivated by almost all Indigenous Papuan (OAP) farmers because these commodities are in accordance with the OAP farming culture (Akzar et al., 2020; Yuwono, 2019), so that the development of local food commodities also means development of the welfare level of OAP farmers, although it must still be synergized with local food commodities resulting from introductions which are generally more cultivated by non-OAP farmers. Sufficient local food commodity production is expected to ensure that food needs in Teluk Bintuni Regency are met, but in reality, the food security situation in Teluk Bintuni Regency is at a high level of vulnerability based on a food security study conducted by The Food and Land Coalition in 2019, which showed that the Food Security Index (IKP) which measures the availability, affordability, and utilization of West Papua food ranges from 26.03 to 61.41 with 6 regencies having an IKP <41.52 or having a high level of vulnerability, namely, Pegunungan Arfak Regency, Maybrat Regency, Teluk Bintuni Regency, Teluk Wondama Regency, and Tambrauw Regency.

The development of Teluk Bintuni Regency has encouraged an increase in the conversion of agricultural land to other uses. This will have an impact on the reduction of agricultural land which will then have an impact on the level of crop production, including local staple crops. This also has an impact on the availability of local staple foods in this area. For this reason, a study related to the level of production and productivity of local food commodities cultivated by OAP farmers throughout the district of Teluk Bintuni Regency needs to be analyzed. This study was conducted to determine the level of productivity of local staple food crops of OAP farmers in Teluk Bintuni Regency.

LITERATURE REVIEW

The high level of vulnerability in food status explains that there are limitations in providing sufficient food to meet needs within the region itself, due to difficulties in reaching and utilizing food sources due to weak accessibility and supporting infrastructure. This is in line with what was stated by Rivani (2022) that access to local food source commodities is a strategy in preventing a food crisis, even Saragih et al., (2022) said that access to markets providing local food sources is a form of food security. In addition, the availability of supporting facilities and infrastructure will provide motivation and opportunities for farmers to be able to distribute the production of food source commodities to end consumers.

METHODOLOGY

This research was conducted in Teluk Bintuni Regency, West Papua Province, and lasted for approximately 1 month in July 2024. The method used in this study is a descriptive method with a case study technique. The case in this study is the productivity of local staple crops of indigenous Papuans (OAP) in Teluk Bintuni Regency. The data in this study uses primary data and secondary data. Primary data was taken through interviews and based on a list of questions that had been prepared. While secondary data comes from BPS data that has been published by the Central Statistics Agency (BPS) of Teluk Bintuni Regency and from other agencies and other literature. The BPS data used is data from production, land area and productivity of local staple crops in 2022. The number of samples in this study was 60 OAP farmers. Samples were taken from villages in districts where the majority of the population is OAP, namely Manimeri, Bintuni, Tuhiba, Tembuni, Meyado, Yakora, Arandai, Tomu, Aroba and Sumuri Districts. Data analysis was carried out using descriptive statistical analysis. The productivity measurement used is land productivity with the following formula:

$$Produktivitas = \frac{Jumlah\ Produksi}{Luas\ Panen}$$

RESULTS AND DISCUSSION

Profile of Teluk Bintuni Regency

Teluk Bintuni Regency is one of the regencies in West Papua Province, which is a division of Manokwari Regency based on Law Number 26 of 2002 with its capital in Bintuni. Teluk Bintuni Regency consists of 24 districts covering 115 definitive villages, 144 preparatory villages and 2 sub-districts with an area of 18,637 km2. The four districts with the largest areas are Sumuri, Kuri, Tembuni and Fafurwar Districts. Geographically, Teluk Bintuni Regency borders Manokwari Regency to the north, Teluk Wondama Regency to the east, Fakfak Regency and Kimana Regency to the south, and South Sorong Regency to the west. Based on the population projection results for 2023, the population of Teluk Bintuni Regency is 90,101 people consisting of 52,005 men and 38,096 women. The population growth rate of Teluk Bintuni Regency in 2023 compared to 2021 is 1.15% per year, with a population density of 4.8 in 2023, this figure means that there are 4-5 people per km2. The sex ratio is 138.85, which means around 139 men for every 100 women. Based on age, there are 23.97% of the population under 15 years old, and 2.68% over 64 years old. This means that the number of productive population is 73.34% (BPS, 2024). This productive population is a potential source of labor for Teluk Bintuni Regency. Realization of Original Regional Income (PAD) of Teluk Bintuni Regency in 2020 amounted to IDR 50,484,417.74 million with the largest income coming from regional taxes with a percentage of 74.19%. The GRDP per capita value based on current prices for Teluk Bintuni Regency in 2022 was IDR 392.07 million, increasing to IDR 438.81 million in 2023. The growth of GRDP per capita in 2023 was 4.87%. The processing industry has the largest contribution to the economic structure of Teluk Bintuni Regency, with a contribution of 54.78%. Meanwhile, the agriculture, forestry and fisheries sector has the fourth largest contribution to the

economic structure of Teluk Bintuni Regency. Based on current prices, the contribution of the agriculture, forestry and fisheries sector in 2023 reached IDR 982.43 billion or 2.48% (BPS, 2023).

Productivity of Local Staple Food Commodities

Papua's local staple foods consist of several types that have long been part of the culture and life of the local community, including sago, tubers, corn and bananas. The development of local food in Papua has great potential to support food security and community welfare. The challenges faced, such as limited agricultural technology, market access, and transportation, need to be addressed with extension, infrastructure support, and research into the development of superior seeds. The decreasing land area due to the increasing population has an impact on the productivity of local staple food commodities. According to Sari and Sejati (2021), the results of the Location Quotient (LQ) and Shift Share Analysis (SSA) analysis showed that rice, corn, cassava, and sweet potatoes are the leading commodities of Teluk Bintuni Regency.

Table 1 shows that rice plants are found in Teluk Bintuni Regency, and are only found in several areas, namely paddy fields are found in Manimeri, Tembuni and Meyado Districts, while dryland rice is found in Merdey District for dryland rice. This is because this area is a transmigration area so that the type of rice plant is one of the food crops cultivated. Cassava and corn plants are cultivated in almost all districts. This happens because most of the people in Teluk Bintuni Regency are OAP who generally plant cassava and corn as their food sources. Details regarding the types of staple foods planted and their distribution can be seen in table 1.

Table 1. Number and Name of Districts with Staple Food Commodities in Teluk Bintuni Regency

Commodity	Number of Districts with Local Food Commodities	District Name
Rice Fields	3	Manimeri, Tembuni, Meyado
Paddy Field	1	Merdey
Corn	22	Farfurwar, Babo, Sumuri, Aroba, Kaitaro, Kuri, Wamesa, Bintuni, Manimeri, Tuhiba, Dataran Beimes, Tembuni, Aranday, Moskona Selatan, Meyado, Moskona Barat, Merdey, Biscoop, Masyeta, Moskona Utara, Moskona Timur.
Cassava	23	Farfurwar, Babo, Sumuri, Aroba, Kaitaro, Kuri, Wamesa, Bintuni, Manimeri, Tuhiba, Dataran Beimes, Tembuni, Aranday, Kamundan, Weriagar, Moskona Selatan,

		Meyado, Moskona Barat, Merdey, Biscoop, Masyeta, Moskona Utara, Moskona Timur.
Sweet Potatoes	22	Farfurwar, Babo, Sumuri, Aroba, Kaitaro, Kuri, Wamesa, Bintuni, Manimeri, Tuhiba, Dataran Beimes, Tembuni, Aranday, Weriagar, Moskona Selatan, Meyado, Moskona Barat, Merdey, Biscoop, Masyeta, Moskona Utara, Moskona Timur.
Taro	20	Farfurwar, Babo, Sumuri, Aroba, Kaitaro, Kuri, Wamesa, Bintuni, Manimeri, Tuhiba, Dataran Beimes, Tembuni, Moskona Selatan, Meyado, Moskona Barat, Merdey, Biscoop, Masyeta, Moskona Utara, Moskona Timur.

Source : BPS, 2023

Staple food productivity in Teluk Bintuni Regency is presented in Figures 1 and 2. Figure 1 shows that the level of corn productivity is higher than the productivity of lowland rice and dryland rice. When viewed from the land area, the average area of corn plants is 0.08 Ha larger than the area of lowland rice plants. When viewed from the average amount of production, corn plants have an average production amount that is 0.02 tons higher than the amount of lowland rice production. So from the land area and the amount of production, corn plants are more than lowland rice. The results of Ruslan's (2021) study show that in the period 2014 to 2019, corn productivity in Indonesia has increased, which is due to the introduction of hybrid seeds in recent years. According to Sari and Sejati (2021), the Aroba, Muskona and Bintuni Districts are the central areas for corn development in Teluk Bintuni Regency.

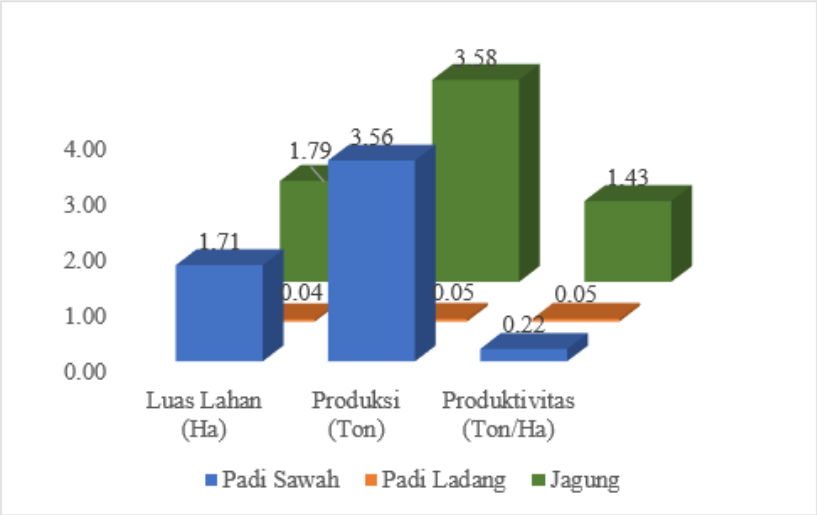

Figure 1. Average Land Area, Production and Productivity of Lowland Rice, Dryland Rice and Corn in Teluk Bintuni Regency (BPS, 2023)

The production of cassava, sweet potatoes and taro in the Papua region is greatly influenced by geographical factors, climate, and local farming habits. Generally, tuber cultivation is carried out traditionally and using simple technology. Although currently tubers are starting to be replaced by rice as a food source, the use of tubers as a staple food for the people in Papua is still carried out, as is the case in Teluk Bintuni Regency. Consumption of tubers is influenced by the availability of these tubers. The land area, production and productivity of tubers in Teluk Bintuni Regency are presented in the following figure.

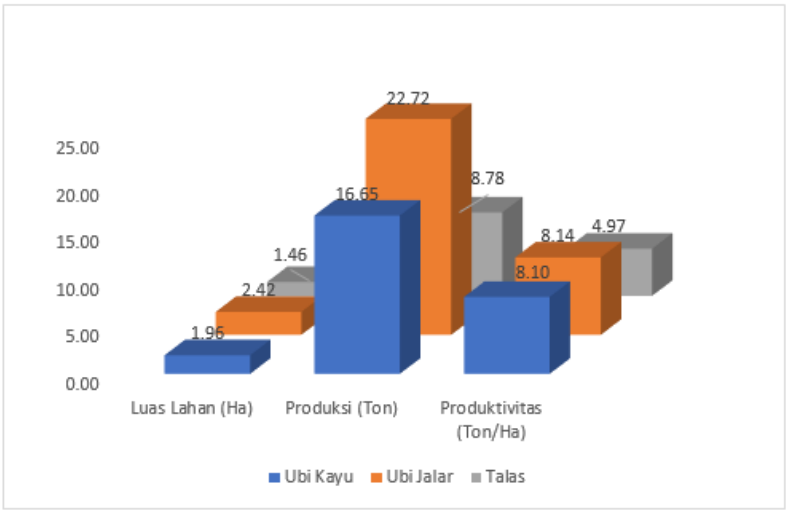

Figure 2. Land Area, Production and Productivity of Cassava, Sweet Potatoes and Taro in Teluk Bintuni Regency (BPS, 2023)

Figure 2 shows that the land area, production and productivity of sweet potatoes are higher than cassava and taro. Rauf and Lestari (2009) stated that sweet potatoes can be found in various regions in Papua, both in highland and lowland areas. Sweet potatoes are able to adapt and produce well even using simple cultivation techniques.

The productivity of various local staple foods can be applied in consuming various staple foods to support the fulfillment of optimal individual energy needs (Adha and Suseno, 2020).

Identity of OAP Respondents

The identity of OAP farmer respondents in Teluk Bintuni Regency consists of gender, age and education level which can be seen in table 2.

Table 2. Identity of Indigenous Papuan Respondents in Teluk Bintuni Regency

Description	Number of Respondents	Nisbah (%)
Gender		
a. Male	30	50,00
b. Female	30	50,00
Age		
a. < 15	0	0
b. 15 – 55	59	98,33
c. > 55	1	1,67
Level of education		
a. SD	36	60,00
b. SMP	11	18,33
c. SMA	11	18,33
d. College	2	3,33

Source : Data Primer, 2024

Table 2 shows that the number of male and female respondents is the same. There was no intention in selecting respondents according to gender because the selection was done randomly during interviews in the field. Based on age, most respondents were in the age range of 15 to 55 years. This shows that most respondents are of productive age. Farmers of productive age have potential abilities in farming activities. Based on education level, most respondents have an elementary school education (SD), or a low level of education. However, there are respondents who have an education level up to college.

Area of OAP Farmers' Land

Land is one of the main production factors in agriculture, because land is a place for plants to grow and develop, including tuber commodities cultivated by OAP farmers. In addition, land is also a place to cultivate livestock. Land is a limited resource, and in modern agriculture, limited land is a challenge in itself along with the increasing need for food. The role of land for OAP farmers is very important because the use of technology that leads to land intensification has not developed much and is carried out by farmers in increasing their agricultural production. So that the increase in local food commodity production carried out

by OAP farmers in Teluk Bintuni Regency is currently still very dependent on the availability of land which is carried out through extensification. The average actual land area cultivated by OAP farmers in Teluk Bintuni Regency is 35.02 Ha. OAP farmers have more than one land, namely there are three land fragments. Land I is usually planted with vegetables or horticulture, Land II is used for food crop farming, and Land III for plantation crops. However, this diversification is not very clear and rigid in its use, farmers tend to cultivate crops in a mixed manner in an agricultural land with clear boundaries.

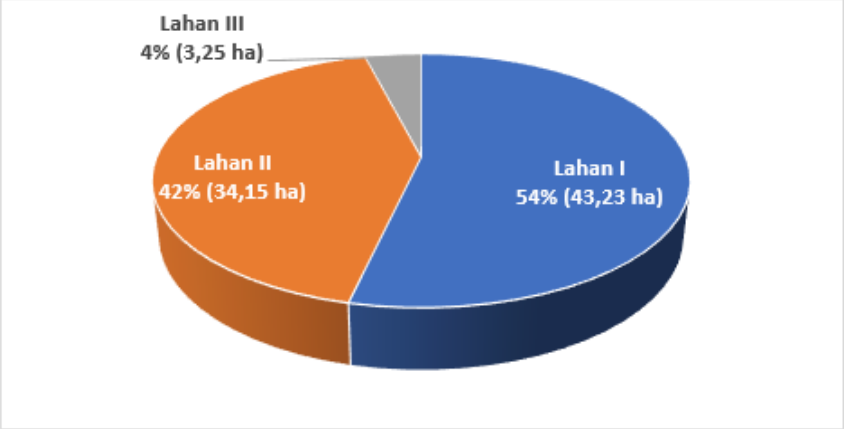

Figure 3. Number and Area of Active Land Used by OAP Farmers in Local Food Commodity Farming

Figure 3 shows that the land cultivated by OAP farmers for vegetables and horticulture has the largest total land area. Meanwhile, the land cultivated for food crops is less than the land area for vegetables. Potential land in Teluk Bintuni Regency is 1,443 Ha. Potential land in the narrow sense is land that provides high agricultural yields even though it is managed at low cost. Meanwhile, in the broad sense, potential land is land that can be utilized by humans to meet human needs (Romenah, 2010). Potential land is divided into swamp land covering 742.51 Ha and actual land covering 700.49 Ha. Based on mapping using drones, the actual/active land area, only 11.56% (80.6 ha) of agricultural land is currently being cultivated for local food commodities with an average land area cultivated by each respondent ranging from 0.76 ha - 0.92 ha. The survey results also explain that of the 80.6 ha of active local food land, only 40.01 ha of land area is allocated for cultivating local food commodities with the allocation of planting land for taro commodities of 15.9 ha (39.73%), cassava of 14.13 ha (35.32%), and sweet potatoes of 9.98 ha (24.96%), this is due to the diversification of local food crops and introduced food and other vegetable crops that are cultivated in a mixed crop manner on each agricultural land..

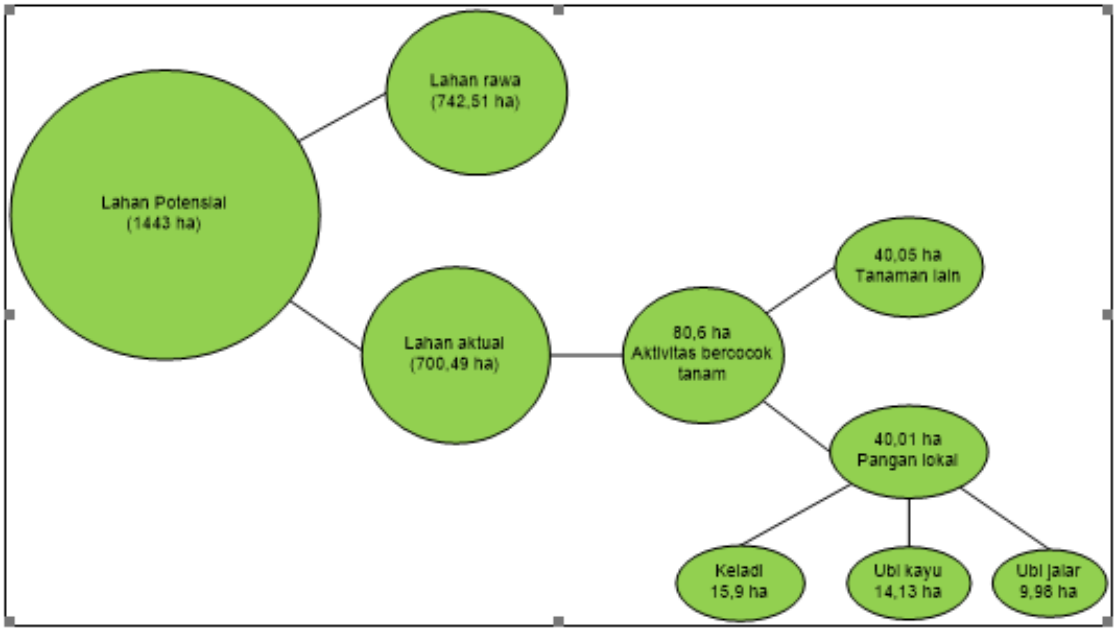

Figure 4. Potential Land Area, Actual Land Area, and Land Area Used by OAP Farmers in Local Food Commodity Farming of Taro, Cassava, and Sweet Potato.
(Source: Primary Data, 2024)

OAP Farmers' Land Productivity

The productivity measurement approach can be grouped into objective measurement and subjective measurement. Objective measurement uses a statistical approach (sampling survey) and measurement experiments. While subjective measurement only relies on subjective estimates of data collectors based on field conditions (Ruslan, 2021). Based on this classification, this study uses a subjective approach.

Table 3. Production Amount, Land Area (Planting) and Local Food Productivity Cultivated by OAP Farmers

Local Food Commodities	Production (ton)	Land area (ha)	Productivity (ton/ha)
Taro	3,72	15,9	0,23
Cassava	3,96	9,98	0,39
Sweet Potato	1,96	14,13	0,13

Source: Data Primer, 2024

The production of local staple foods cultivated by OAP farmers is still very low, taro commodities produced by OAP respondent farmers are only 1.77% or only 3.72 tons of the total 210.80 tons of production in Teluk Bintuni. The sweet potato food commodity produced is 0.35% or only 1.96 tons of the total 545.20 tons of sweet potato production in Teluk Bintuni. Furthermore, the local cassava food commodity produced is 0.99% or only 3.96 tons of the total 399.50 tons of cassava production in Teluk Bintuni. The low condition of local staple food production per land area triggers the low level of productivity of local staple foods cultivated by OAP farmers in Teluk Bintuni Regency. The results show that

the productivity of local staple crops cultivated by OAP farmers, both taro, cassava and sweet potatoes, is less than 1 ton/Ha.

CONCLUSIONS AND RECOMMENDATIONS

The results of the study showed that the production of local staple foods by OAP farmers such as taro was 3.72 tons or 1.77% of the total production in Teluk Bintuni Regency, sweet potatoes were 1.96 tons or 0.35% of the total production in Teluk Bintuni Regency and cassava production by OAP farmers was 3.96 tons. The productivity of taro was 0.23 tons/ha, cassava was 0.39 tons/ha, and sweet potatoes were 0.13 tons/ha. If seen, the level of productivity of local staple crops cultivated by OAP farmers is relatively low. There needs to be intensive efforts to increase the productivity of these local staple foods.

FURTHER STUDY

This research still has limitations, so it is necessary to carry out further research related to the topic of Productivity of Local Food Commodities of Orang Asli Papua (OAP) Households in order to improve this research and add insight to readers.

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