# THE PREEMINENCE OF AGRICULTURE AS
# A LEADING SECTOR IN GORONTALO UTARA

## Sriwahyuni Palia, Mahludin Baruwadi, Ria Indriani
Department of Agribusiness, Postgraduate Program, Gorontalo State University

## ABSTRACT
Gorontalo Utara manages agricultural sectors as the main activator in the field of agribusiness. This is evidenced by the contribution of agricultural sectors. Agricultural sectors pose its dominancy in the Regional Gross Domestic Product in Gorontalo Utara by 43.68%. This research aims to analyze the preeminence of agricultural sectors as a leading sector in Gorontalo Utara. The research method used was a survey built upon secondary data. The findings indicate that agricultural sectors highlighted the preeminence of Gorontalo Utara as the best area for coconut plantations, horticulture (chilis, bananas, and ginger), animal farming (cows, goats, and horses), forestry, and fish farming (skipjack tunas, sardinellas (lemurs), shrimps, carps, and nile tilapia).

*Keywords:* *Agricultural Subsector, Localization Analysis, Location Quotient Analysis, Specialization Analysis,*

## INTRODUCTION

Indonesia is a country with vast natural resources. It comes with wealthy water, land area, forest, sea, and biodiversity resources which spread in the islands of Indonesia. The natural resources are one of the capitals of economic development in Indonesia. Several optimizing attempts, one of which for agricultural sectors, especially in the primary commodity, should thus be made (Widyawati, 2017).

Agricultural sectors play a major part in fulfilling primary needs, clothes, and housing. Also, it gives opportunities for those who are looking for jobs, highly contribute to national income, provide foreign exchange for the country, and has high economic multiplier effects with low dependence on imports. Developing agricultural sectors aims to fulfill the needs of food and nutrition and elevate the community income (public welfare) (Lisdiyawati, 2017).

Gorontalo Utara is well-known for its agricultural sectors which are the primary activator in the field of agribusiness. This is evidenced by the large contribution of the sectors. The sectors dominate the establishment of Regional Gross Domestic Product in Gorontalo Utara by 43.68%. The domination is supported by the land area of 5,256 and the non-rice field area of 76.086. Besides, it is also sustained by the livelihood of the majority of the Gorontalo Utara community, which is 15,262 in number, working as farmers. As such, an increase in agricultural sectors implies an increase in the income of the majority of the Gorontalo Utara community. Furthermore, agricultural sectors were predominant by 1,426,579.6 in 2017 (Statistics Indonesia in Gorontalo Utara: 2017).

Gorontalo Utara has an opportunity to develop its agricultural sectors comprising of horticulture subsectors i.e. vegetable e.g. onions, chilis, tomatoes, eggplants, and swamp-morning glory. In terms of fruit, most Gorontalo Utara farmers concentrate on durians with a production of 334.4 tons. Atinggola was awarded as the subdistrict which had the highest durian production in 2019. Meanwhile, in terms of crops, most farmers cultivate rice and corn. However, others also prefer upland rice, soybeans, peanuts, green beans, cassavas, and sweet potatoes. Moreover, in terms of plantation crops, we can easily find coconuts, hybrid coconuts, coffee, cacao, cashew, and sugar palms. In terms of animal farming, farmers in Gorontalo Utara prefer beef cattle and goats. Meanwhile, the most common type of poultry bred in Gorontalo Utara is free-range chicken. Besides, as a district with a long coastal line, Gorontalo Utara is also popular for its capture fishery production. It managed to capture 25,013.29 tons of fish in 2018. Skipjack tunas, with the production of 2,685.44 tons, contribute to the highest production (BPS, 2020).

**RESEARCH METHODOLOGY**

The method applied in this research was a survey by secondary data. The data analysis used was the regional economic analysis in which we used the analysis of specialization, localization, and Location Quotient (LQ) using the data of the total production of the respective agricultural sectors categorized by districts. Furthermore, agricultural sectors to be analyzed were plantation, horticulture, food crops, animal farming, fish farming, and forestry. The formulae used in the analysis of localization was:

$$A = (vi/Vi) - (vt/Vt)$$

The coefficient of localization was acquired by summing (vi/Vi) –(vt/Vt) which had a positive symbol under the stipulation that if α ≥ 1, agricultural sectors were concentrated on one area. Meanwhile, if α < 1, the agricultural sectors spread in several areas. The analysis of specialization was used to examine the specialization of Gorontalo Utara towards agricultural sectors using the following formula.

$$B = (vi/vt) - (Vi/Vt)$$

The coefficient of specialization was acquired by summing (vi/vt) – (Vi/Vt) which had a positive symbol under the stipulation that if β ≥ 1, an area was specialized in agricultural sectors. Meanwhile, if β < 1, the area was not specialized. The analysis of basis was used to identify agricultural sectors in Gorontalo Utara which were run in a district, whether they belonged to basis or non-basic sectors, using the following formula.

$$LQ = (vi/vt) / (Vi/Vt)$$

Agricultural sectors in an area belonged to a basis sector if the coefficient of LQ ≥ 1; whereas if LQ < 1, they did not. The restriction of the three formula was:

Vi = the production of agricultural sectors at the subdistrict level

Vi = the production of agricultural sectors at the district level

Vt = the production of agricultural sectors at the subdistrict level

Vt = the production of agricultural sectors at the district level

LQ = the coefficient of location quotient

**FINDINGS AND DISCUSSION**

The approach to analyze agricultural sectors was using the analyses of localization, specialization, and location quotient. The results of the analysis of the respective subsectors were:

**1. Plantation Subsector**

According to the result of the analysis, of seven commodities in the plantation subsector in Gorontalo Utara, none had a coefficient of localization of more than one. This implies that the plantation subsector in Gorontalo Utara was not concentrated on certain subdistricts. Furthermore, the highest coefficient of localization was indicated by hybrid coconuts at α = 0.870, subsequently followed by cacao (α = 0.847), and sugar palm (α = 0.791). Moreover, the lowest one was indicated by coconuts, nutmegs, and sugar palm and coffee at α = 0.000, α = 0.191, and α = 0.586 respectively. Here, we can sub-conclude that the tree plantation commodities spread rapidly and could be found in all subdistricts in Gorontalo Utara.

**Table 1. The Regional Economic Analysis of Plantation Subsector in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
| --- | --- | --- | --- |
| | | Localization | Specialization |
| 1 | Coconut | 0.000 | 1.104 |
| 2 | Hybrid coconut | 0.870 | 0.012 |
| 3 | Cacao | 0.847 | 0.063 |
| 4 | Clove | 0.586 | 0.028 |
| 5 | Sugar palm | 0.791 | 1.008 |
| 6 | Candlenut | 0.586 | 0.004 |
| 7 | Coffee | 0.191 | 0.004 |

*Source: Data Processed, 2020*

Besides measuring the distribution, specializing plantation commodities should be followed by determining the specialization of Gorontalo Utara in terms of plantation commodities. As presented in Table 1, Gorontalo Utara specialized two plantation commodities (β > 1) which were coconuts (β = 1.104) and sugar palm (β =1.008). Referring to the analysis of the coefficient of localization, the two specialized plantation commodities were potential to be developed in Gorontalo Utara.

Another approach to commodity localization was the approach to economic basis using the analysis of location quotient. The data used were the production data, and the coverage of the research area was subdistrict. An area was considered having basis power in terms of plantation commodities if LQ > 1.

Eleven subdistricts were investigated in terms of their plantation production. Table 2 shows the name and the number of subdistrict areas which are regarded as a basis of plantation commodity. Coconuts were a basis plant in seven subdistricts, hybrid coconuts in two subdistricts, cacao in two subdistricts, and sugar palms in two subdistricts. Meanwhile, cloves, candlenuts, and coffee were a basis plant in only one subdistrict each. Considering the evidence, the potential plantation commodity to be professionally developed was coconuts.

**Table 2. The Analysis of the Basis of Plantation Commodity in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|---|---|---|---|---|
| 1 | Coconut | Atinggola, Tomilito, Ponelo Kepulauan, Kwandang, Anggrek, Monano, Tolinggula | 7 | 63 |
| 2 | Hybrid coconut | Gentuma, Kwandang | 2 | 18 |
| 3 | Cacao | Gentuma, Sumalata | 2 | 18 |
| 4 | Clove | Sumalata Timur | 1 | 9 |
| 5 | Sugar palm | Atinggola, Gentuma Raya | 2 | 18 |
| 6 | Candlenut | Sumalata Timur | 1 | 9 |
| 7 | Coffee | Gentuma Raya | 1 | 9 |

*Source: Data Processed, 2020*

## 2. Horticulture Subsector

The approach to analyzing the localization of the horticulture subsector was the regional economic analysis. The analysis used was the analysis of localization, specialization, and basis. The result of the analysis of the respective horticulture commodities is indicated as follows:

### a) Vegetable

Referring to the analysis, the coefficient of localization of eight vegetable commodities in Gorontalo Utara was less than one, implying that the vegetable commodity in Gorontalo Utara was not concentrated on certain subdistricts. The highest coefficient of localization was indicated by cucumbers and long beans at $\alpha = 0.961$ followed by swamp-morning glory at $\alpha = 0.949$, onions at $\alpha = 0.922$, and red chilis at $\alpha = 0.922$. Moreover, the lowes coefficient was indicated by chilis, eggplants, and tomatoes at $\alpha = 0.000$, $\alpha = 0.458$, and $\alpha = 0.481$ respectively. In other words, the last three vegetable commodities had the widest distribution and hence they could be found in all subdistricts in Gorontalo Utara.

**Table 3. The Regional Economic Analysis of Vegetable Commodities in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
|---|---|---|---|
| | | Localization | Specialization |
| 1 | Onion | 0.922 | 0.019 |
| 2 | Long bean | 0.961 | 0.107 |
| 3 | Red chili | 0.922 | 0.094 |

| | | | |
|---|---|---|---|
| 4 | Chili | 0.000 | 1.770 |
| 5 | Tomato | 0.481 | 0.001 |
| 6 | Eggplant | 0.458 | 0.401 |
| 7 | Cucumber | 0.961 | 0.006 |
| 8 | Swamp-morning glory | 0.949 | 0.041 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of vegetable commodities in Gorontalo Utara should also be considered here. According to Table 3, the specialized vegetable commodity in Gorontalo Utara ($\beta > 1$) was chilis ($\beta = 1.770$). Based on the analysis of the coefficient of localization, the specialized commodity, which is chilies, can be developed as a preeminent horticulture commodity in Gorontalo Utara.

Another approach to the localization of commodities was the economic approach to the basis using the analysis of location quotient. Data used in this analysis were the production in subdistricts. A subdistrict was considered powerful in terms of its basis of vegetable commodities if $LQ > 1$. You can observe the vegetable commodities considered basis in several subdistricts in Table 4.

Eleven subdistricts were analyzed in terms of their vegetable production. Table 4 indicates the number and the name of subdistricts which were regarded as the basis for vegetable commodities. Chilies and eggplants were the basis plants in seven and two subdistricts respectively, whereas onions, long beans, red chilis, tomatoes, cucumbers, and swamp-morning glory were the basis plants in one subdistrict. As such, the preeminent vegetable commodity which could be professionally developed was chilies.

**Table 4. The Analysis of Basis of Vegetable Commodities in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|---|---|---|---|---|
| 1 | Onion | Sumalata | 1 | 9 |
| 2 | Long bean | Sumalata Timur | 1 | 9 |
| 3 | Red chili | Sumalata | 1 | 9 |
| 4 | Chili | Ponelo Kepulauan, Kwandang, Anggrek, Monano, Sumalata Timur, Tolinggula | 7 | 63 |
| 5 | Tomato | Kwandang | 1 | 9 |
| 6 | Eggplant | Ponelo Kepulauan, Kwandang | 2 | 18 |
| 7 | Cucumber | Sumalata | 1 | 9 |
| 8 | Swamp-morning glory | Gentuma Raya | 1 | 9 |

*Source: Data Processed, 2020*

**b) Fruit**

Referring to the analysis, the coefficient of the localization of seven fruit commodities in Gorontalo Utara was less than one, implying that fruit commodities in Gorontalo Utara were not concentrated on certain subdistricts. The highest coefficient of localization was achieved by avocadoes and starfruits at $\alpha = 0.913$, followed by rambutans and langsats at $\alpha = 0.627$ and $0.618$ respectively. Meanwhile, the lowest coefficient was indicated by mangoes, bananas, and jackfruits at $\alpha = -2.267$, $0.000$, and $0.098$ respectively. This evidence signifies that the last group of fruit commodities spread the most, or you could find them in all subdistricts in Gorontalo Utara.

**Table 5. The Regional Economic Analysis of Fruit Commodities in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
| --- | --- | --- | --- |
| | | Localization | Specialization |
| 1 | Avocado | 0.913 | 0.005 |
| 2 | Starfruit | 0.913 | 0.047 |
| 3 | Langsat | 0.618 | 0.069 |
| 4 | Durian | 0.145 | -0.540 |
| 5 | Mango | -2.267 | 1.301 |
| 6 | Jackfruit/cempedak | 0.098 | 0.335 |
| 7 | Pineapple | 0.337 | 0.410 |
| 8 | Papaya | 0.107 | 0.108 |
| 9 | Banana | 0.000 | 2.098 |
| 10 | Rambutan | 0.627 | 0.141 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of fruit commodities in Gorontalo Utara should also be considered here. According to Table 5, the specialized fruit commodity in Gorontalo Utara ($\beta > 1$) was mangos ($\beta = 1.301$). Based on the analysis of the coefficient of localization, the specialized commodity, which was mangos, could be developed as a preeminent horticulture commodity in Gorontalo Utara.

Another approach to the localization of commodities was the economic approach to the basis using the analysis of location quotient. Data used in this analysis were the production in subdistricts. A subdistrict was considered powerful in terms of its basis of fruit commodities if LQ > 1. You can observe the fruit commodities considered basis in several subdistricts in Table 6.

Eleven subdistricts were analyzed in terms of their fruit production. Table 6 indicates the number and the name of subdistricts which were regarded as the basis for fruit commodities. Bananas and mangoes were the basis plants in seven and five subdistricts respectively, whereas jackfruits and pineapples were the basis plants in four subdistricts. Furthermore, langsats were the basis plants in three subdistricts, while durians, avocadoes, starfruits, rambutans, and papayas were the basis

plants in one and two subdistricts. As such, the preeminent fruit commodity which could be professionally developed was bananas.

**Table 6. The Analysis of Basis of Fruit Commodities in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|---|---|---|---|---|
| 1 | Avocado | Tolinggula | 1 | 9 |
| 2 | Starfruit | Tolinggula | 1 | 9 |
| 3 | Langsat | Gentuma Raya, Tolinggula, Biau | 3 | 27 |
| 4 | Durian | Atinggola, Tolinggula | 2 | 18 |
| 5 | Mango | Gentuma Raya, Ponelo Kepulauan, Anggrek, Tolinggula, Biau | 5 | 45 |
| 6 | Jackfruit/cempedak | Atinggola, Anggrek, Tolinggula, Biau | 4 | 36 |
| 7 | Pineapple | Gentuma Raya, Tomilito, Ponelo Kepualauan, Anggrek | 4 | 36 |
| 8 | Papaya | Anggrek, Tolinggula | 2 | 18 |
| 9 | Banana | Atinggola, Ponelo Kepualauan, Anggrek, Sumalata, Sumalata Timur, Tolinggula, Biau | 7 | 63 |
| 10 | Rambutan | Sumalata, Tolinggula | 2 | 18 |

*Source: Data Processed, 2020*

### c) Bio-pharmacy

Based on the analysis, the coefficient of the localization of three bio-pharmacy commodities in Gorontalo Utara was less than one, signifying that bio-pharmacy commodities in Gorontalo Utara were not concentrated on certain subdistricts. The highest coefficient of localization was achieved by galangal at $\alpha = 0.780$, while the lowest coefficient was indicated by ginger at $\alpha = 0.003$. This evidence signifies that ginger commodities spread the most, or you could find them in all subdistricts in Gorontalo Utara.

**Table 7. The Regional Economic Analysis of Bio-pharmacy Commodities in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
|---|---|---|---|
| | | Localization | Specialization |
| 1 | Ginger | 0.003 | 5.002 |
| 2 | Galangal | 0.780 | 0.083 |
| 3 | Turmeric | 0.036 | 1.094 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of bio-pharmacy commodities in Gorontalo Utara should also be considered here. According to Table 7, the specialized bio-pharmacy commodities in Gorontalo Utara ($\beta > 1$) were gingers and turmerics ($\beta = 1.094$). Based on the analysis of the coefficient of localization, the two specialized commodities, could be developed as preeminent bio-pharmacy commodities in Gorontalo Utara.

Another approach to the localization of commodities was the economic approach to the basis using the analysis of location quotient. Data used

in this analysis were the production in subdistricts. A subdistrict was considered powerful in terms of its basis of bio-pharmacy commodities if LQ > 1. You can observe the bio-pharmacy commodities considered basis in several subdistricts in Table 8.

Eleven subdistricts were analyzed in terms of their plantation production. Table 8 indicates the number and the name of subdistricts which were regarded as the basis for bio-pharmacy commodities. Gingers were the basis plants in three subdistricts, whereas turmerics and galangals were the basis plants in two and one subdistricts, respectively. As such, the preeminent bio-pharmacy commodity which could be professionally developed was ginger.

**Table 8. The Analysis of Basis of Bio-pharmacy Commodities in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|-----|-----------|----------------|----------------------|----------------|
| 1 | Ginger | Gentuma, Tomilito, Ponelo Kepulauan | 3 | 27 |
| 2 | Galangal | Sumalata | 1 | 9 |
| 3 | Turmeric | Gentuma Raya, Monano, Sumalata | 2 | 18 |

*Source: Data Processed, 2020*

### 3. Food Crops Subsector

Referring to the analysis, the coefficient of the localization of three food crops subsector commodities in Gorontalo Utara was less than one, signifying that food crops subsector commodities in Gorontalo Utara were not concentrated on certain subdistricts.

The highest coefficient of localization was achieved by corns at $\alpha = 0.158$, while the lowest coefficient was indicated by upland rice at $\alpha = 0.034$. This evidence signifies that upland rice commodities spread the most, or you could find them in all subdistricts in Gorontalo Utara.

**Table 9. The Regional Economic Analysis of Food Crops Subsector Commodities in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
|-----|-------------------|--------------|----------------|
| | | Localization | Specialization |
| 1 | Rice | 0.144 | -0.129 |
| 2 | Upland rice | 0.034 | 0.099 |
| 3 | Corn | 0.158 | 1.559 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of food crops subsector commodities in Gorontalo Utara should also be considered here. According to Table 9, the specialized food crops subsector commodity in Gorontalo Utara ($\beta > 1$) was corn ($\beta = 1.559$). Based on the analysis of the coefficient of localization, the specialized commodity, which was corn, could be developed as a preeminent food crops subsector commodity in Gorontalo Utara.

Another approach to the localization of commodities was the economic approach to the basis using the analysis of location quotient. Data used

in this analysis were the production in subdistricts. A subdistrict was considered powerful in terms of its basis of food crops commodities if LQ > 1. You can observe the food crops commodities considered basis in several subdistricts in Table 10.

Eleven subdistricts were analyzed in terms of their food corps production.

Table 10 indicates the number and the name of subdistricts which were regarded as the basis for food crops commodities. Corn was the basis plants in seven subdistricts, whereas rice and upland rice were the basis plants in four subdistricts. As such, the preeminent food corps commodity which could be professionally developed was corn.

**Table 10. The Analysis of Basis of Food Corps Commodities in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|---|---|---|---|---|
| 1 | Rice | Gentuma Raya, Sumalata, Tolinggula Biau | 7 | 63 |
| 2 | Upland rice | Atinggola, Ponelo Kepulauan, Kwandang Sumalata | 2 | 18 |
| 3 | Corn | Atinggola, Tomilito, Ponelo Kepulauan, Kwandang, Anggrek Monano, Sumalata Timur | 2 | 18 |

*Source: Data Processed, 2020*

## 4. Animal Farming Subsectors

Referring to the analysis, the coefficient of the localization of ten animal farming subsector commodities in Gorontalo Utara was less than one, signifying that animal farming subsector commodities in Gorontalo Utara were not concentrated on certain subdistricts. The highest coefficient of localization was achieved by horses at $\alpha = 0.916$, while the lowest coefficient was indicated by cows, goats, free-range chicken, broilers, and manila ducks at $\alpha = 0.000$. This evidence signifies that cows, goats, free-range chicken, broilers, and manila ducks spread the most, or you could find them in all subdistricts in Gorontalo Utara.

**Table 11. The Regional Economic Analysis of Animal Farming Subsector Commodities in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
|---|---|---|---|
| | | Localization | Specialization |
| 1 | Cow | 0.000 | 0.663 |
| 2 | Goat | 0.000 | 0.150 |
| 3 | Free-range chicken | 0.000 | 1.076 |
| 4 | Broiler | 0.000 | 0.103 |
| 5 | Laying hen | 0.180 | -0.119 |
| 6 | Horse | 0.916 | 0.000 |
| 7 | Pig | 0.390 | 0.018 |
| 8 | Pigeon | 0.226 | 0.005 |
| 9 | Duck | 0.127 | 0..044 |
| 10 | Manila duck | 0000 | 0..066 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of animal farming subsector commodities in Gorontalo Utara should also be considered here. According to Table 11, the specialized animal farming subsector commodity in Gorontalo Utara ($\beta > 1$) was free-range chicken ($\beta = 1.076$). Based on the analysis of the coefficient of localization, the specialized commodity, which was free-range chicken, could be developed as a preeminent horticulture commodity in Gorontalo Utara.

Another approach to the localization of commodities was the economic approach to the basis using the analysis of location quotient. Data used in this analysis were the population in subdistricts. A subdistrict was considered powerful in terms of its basis of animal farming commodities if LQ > 1. You can observe the animal farming commodities considered basis in several subdistricts in Table 12.

Eleven subdistricts were analyzed in terms of their cattle population. Table 12 indicates the number and the name of subdistricts which were regarded as the basis for animal farming commodities. Cows, goats, and horses were the basis cattle in eight subdistricts, whereas others were the basis cattle in seven, six, five, four, and three subdistricts. As such, the preeminent animal farming commodities which could be professionally developed were cows, goats, and horses.

**Table 12. The Analysis of Basis of Animal Farming Commodities in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|---|---|---|---|---|
| 1 | Cow | Atinggola, Tomilito, Ponelo Kepulauan, Anggrek, Sumalata, Sumalata Timur, Tolinggula, Biau | 8 | 72 |
| 2 | Goat | Atinggola, Gentuma Raya, Tomilito, Ponelo Kepulauan, Sumalata, Sumalata Timur, Tolinggula, Biau | 8 | 72 |
| 3 | Free-range chicken | Gentuma Raya, Monano, Biau | 3 | 27 |
| 4 | Broiler | Atinggola, Gentuma Raya, Kwandang, Sumalata, Sumalata Timur, Tolinggula | 6 | 54 |
| 5 | Laying hen | Kwandang, Anggrek | 2 | 18 |
| 6 | Horse | Atinggola, Tomilito, Ponelo Kepulauan, Anggrek, Sumalata, Sumalata Timur, Tolinggula, Biau | 8 | 72 |

| 7 | Pig | Atinggola, Gentuma Raya, Tomilito, Anggrek, Sumalata | 5 | 45 |
| 8 | Pigeon | Atinggola, Kwandang, Monano, Sumalata Timur | 4 | 36 |
| 9 | Duck | Tomilito, Ponelo Kepulauan, Sumalata Timur, Tolinggula | 4 | 36 |
| 10 | Manila duck | Atinggola, Tomilito, Ponelo Kepulauan, Sumalata, Sumalata Timur, Tolinggula, Biau | 7 | 63 |

*Source: Data Processed, 2020*

## 5. Forestry Subsector

Referring to the analysis, the coefficient of the localization of two forestry subsectors in Gorontalo Utara was less than one, signifying that forestry subsectors in Gorontalo Utara were not concentrated on certain subdistricts. The coefficient of the internal and external forest areas indicated α = 0.000. This evidence signifies that the forestry subsectors spread the most, or you could find them in all subdistricts in Gorontalo Utara.

**Table 13. The Regional Economic Analysis of Forestry Subsectors in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
| | | Localization | Specialization |
| --- | --- | --- | --- |
| 1 | Internal area | 0.000 | 1.698 |
| 2 | External area | 0.000 | -0.460 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of forest areas in Gorontalo Utara should also be considered here. According to Table 13, the specialized forest area in Gorontalo Utara ($\beta > 1$) was the internal area ($\beta = 1.698$). Based on the analysis of the coefficient of localization, the specialized area, which was the internal area, could be developed as a preeminent forestry subsector in Gorontalo Utara.

Another approach to the localization of the subsector was the economic approach to the basis using the analysis of location quotient. Data used in this analysis were the forestry areas in subdistricts. A subdistrict was considered powerful in terms of its basis of forestry subsector if LQ > 1. You can observe the forestry subsector considered basis in several subdistricts in Table 14.

Eleven subdistricts were analyzed in terms of their forestry areas. Table 14 indicates the number and the name of subdistricts which were regarded as the basis for forestry subsectors. The internal area was the basis in five subdistricts, whereas the external area was the basis in four subdistricts. As such, the preeminent area which could be professionally developed was the internal area.

**Table 14. The Analysis of Basis of Forestry Subsector in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|---|---|---|---|---|
| 1 | Internal area | Atinggola, Gentuma Raya, Kwandang, Ponelo Kepulauan, Anggrek | 5 | 45 |
| 2 | External area | Tomilito, Monano, Sumalata, Sumalata Timur, Tolinggula, Biau | 4 | 36 |

*Source: Data Processed, 2020*

## 6. Fisheries

### a) Capture Fishery

Referring to the analysis, the coefficient of the localization of 11 capture fishery productions in Gorontalo Utara was less than one, signifying that fishery subsectors in Gorontalo Utara were not concentrated on certain subdistricts. The mean coefficient localization was α = 0.000. This evidence signifies that the fishery production spread, or you could find them in all subdistricts in Gorontalo Utara.

**Table 15. The Analysis of Capture Fishery in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
|---|---|---|---|
| | | Localization | Specialization |
| 1 | Skipjack tuna | 0.000 | 1.576 |
| 2 | Mackerel tuna | -0.003 | 0.001 |
| 3 | Indian mackerel | 0.000 | 0.000 |
| 4 | Yellowstripe scad | 0.000 | 0.000 |
| 5 | Decapterus | 0.000 | 0.001 |
| 6 | Sardinella (lemur) | 0.000 | 0.000 |
| 7 | Sardinella (tembang) | 0.000 | 0.000 |
| 8 | Anchovies | 0.000 | 0.001 |
| 9 | Giant trevally | 0.000 | -0.003 |
| 10 | Orange-spotted grouper | 0.000 | 0.000 |
| 11 | Shrimp | 0.000 | 0.000 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of the fishery subsector in Gorontalo Utara should also be considered here. According to Table 15, the specialized capture fishery production in Gorontalo Utara (β > 1) was skipjack tunas (β = 1.576). Based on the analysis of the coefficient of localization, the specialized capture fishery, which was skipjack tunas, could be developed as a preeminent fishery subsector in Gorontalo Utara.

Another approach to the localization of the fishery subsector was the economic approach to the basis using the analysis of location quotient. Data used in this analysis were the number of capture fishery households in subdistricts. A subdistrict was considered powerful in terms of its basis of capture fishery households if LQ > 1. You can observe the capture fishery households considered basis in several subdistricts in Table 16.

Eleven subdistricts were analyzed in terms of their capture fishery productions. Table 16 indicates the number and the name of subdistricts which were regarded as the basis for capture fisheries. Sardinellas (lemurs) and shrimps were the basis two subdistricts, whereas the others were the basis in one subdistrict. As such, the preeminent capture fishery products which could be professionally developed were sardinellas (lemurs) and shrimps.

**Table 16. The Analysis of Basis of Capture Fishery in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|-----|-----------|----------------|-----------------------|----------------|
| 1 | Skipjack tuna | Kwandang | 1 | 9 |
| 2 | Mackerel tuna | Gentuma Raya | 1 | 9 |
| 3 | Indian mackerel | Kwandang | 1 | 9 |
| 4 | Yellowstripe scad | Gentuma Raya | 1 | 9 |
| 5 | Decapterus | Gentuma Raya | 1 | 9 |
| 6 | Sardinella (lemur) | Gentuma Raya, Kwandang | 2 | 18 |
| 7 | Sardinella (tembang) | Kwandang | 1 | 9 |
| 8 | Anchovies | Gentuma Raya | 1 | 9 |
| 9 | Giant trevally | Kwandang | 1 | 9 |
| 10 | Orange-spotted grouper | Gentuma Raya | 1 | 9 |
| 11 | Shrimp | Gentuma Raya, Kwandang | 2 | 18 |

*Source: Data Processed, 2020*

**b) Aquaculture**

Referring to the analysis, the coefficient of the localization of eight aquaculture subsectors in Gorontalo Utara was less than one, signifying that the fishery subsectors in Gorontalo Utara were not concentrated on certain subdistricts. The highest coefficient of localization was achieved by giant trevallies at $\alpha = 0.801$, while the lowest coefficient was indicated by white-leg shrimps at $\alpha = -0.053$. This evidence signifies that white-leg shrimps spread the most, or you could find them in all subdistricts in Gorontalo Utara.

**Table 17. The Regional Economic Analysis of Aquaculture Households in Gorontalo Utara**

| No. | Type of Commodity | Result of Analysis | |
|-----|-------------------|--------------|----------------|
| | | Localization | Specialization |
| 1 | Giant tiger prawn | 0.090 | 0.285 |
| 2 | White-leg shrimp | -0.053 | -0.036 |
| 3 | Seaweed | 0.218 | 1.426 |
| 4 | Milkfish | 0.290 | 0.079 |
| 5 | Nile tilapia | 0.006 | 2.705 |
| 6 | Iridescent shark | 0.628 | 0.286 |
| 7 | Common carp | 0.006 | 3.673 |
| 8 | Catfish | 0.491 | 0..116 |
| 9 | Giant trevally | 0.801 | 0.004 |

*Source: Data Processed, 2020*

Besides the distribution size, the specialization of fishery subsectors in Gorontalo Utara should also be considered here. According to Table 17,

all aquaculture productions were special in Gorontalo Utara (β > 1) at β = 1.076, 2.705, and 1.426, respectively. Based on the analysis of the coefficient of localization, the specialized aquaculture productions, which were seaweed, common carps, and nile tilapias, could be developed as preeminent fishery subsectors in Gorontalo Utara.

Another approach to the localization of the fishery subsector was the economic approach to the basis using the analysis of location quotient. Data used in this analysis were aquaculture households in subdistricts. A subdistrict was considered powerful in terms of its

basis of aquaculture if LQ > 1. You can observe the aquaculture considered basis in several subdistricts in Table 18.

Eleven subdistricts were analyzed in terms of their aquaculture households. Table 18 indicates the number and the name of subdistricts which were regarded as the basis for aquaculture productions. Nile tilapias and common carps were the basis fishery productions in seven subdistricts, whereas the others were the basis in one and two subdistricts. As such, the preeminent aquaculture productions which could be professionally developed were nile tilapias and common carps.

**Table 18. The Analysis of Basis of Aquaculture Households in Gorontalo Utara**

| No. | Commodity | Basic District | Number of Basis Areas | Percentage (%) |
|-----|-----------|----------------|-----------------------|----------------|
| 1 | Giant tiger prawn | Gentuma Raya | 1 | 9 |
| 2 | White-leg shrimp | Gentuma Raya | 1 | 9 |
| 3 | Seaweed | Ponelo, Kwandang | 2 | 18 |
| 4 | Milkfish | Kwandang | 1 | 9 |
| 5 | Nile tilapia | Tomilito, Ponelo Kepulauan, Monano, Sumalata, Sumalata Timur, Tolinggula, Biau | 7 | 63 |
| 6 | Iridescent shark | Anggrek, Monano | 2 | 18 |
| 7 | Common carp | Atinggola, Tomilito, Monano, Sumalata, Sumalata Timur, Tolinggula, Biau | 7 | 63 |
| 8 | Catfish | Tolinggula | 1 | 9 |
| 9 | Giant trevally | Gentuma Raya | 1 | 9 |

*Source: Data Processed, 2020*

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