Mapping Demographic Conditions and Vegetable Horticulture Production to Support Household Food Security

Rosalina Kumalawati[1*], *Astinana* Yuliarti[2], *Ellyn* Normelani[1], *Karnanto* Hendra Murliawan[3], *Yogi* Prasakti[4], *Rahma* Ayu Dwiratih[4], and *Dea* Eka Paskipra Dewi[4]

[1]Geography Study Program, Faculty of Social and Political Sciences, Universitas Lambung Mangkurat, Banjarmasin, Indonesia
[2]Communication Science, Faculty of Social and Political Sciences, Universitas Lambung Mangkurat, Banjarmasin, Indonesia
[3]Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, Banjarbaru, Indonesia
[4]Geography Study Program Student, Faculty of Social and Political Sciences, Universitas Lambung Mangkurat, Banjarmasin, Indonesia

Abstract. Indonesia is an archipelagic country in the world. This condition affects the demographic conditions in each region in Indonesia. The aim of this research is to determine the mapping of demographic conditions and vegetable horticulture production to support household food security. The research method is descriptive quantitative. Data collection uses secondary resources from Provincial, BPS, Regency data in Figures, demographic data, production and vegetable horticulture harvest area, while primary data was from field observations. The research results show that the population, population growth and population density in Barito Kuala Regency continue to fluctuated fron 2015 to 2024 . Household vegetable needs will increase along with the increase in population growth and population density as happened in Barito Kuala Regency. The amount of vegetable horticulture production in Barito Kuala Regency continues to increased during 2015-2024 even though it has experienced a decline. In 2019-2020 this increase was quite drastic and this could be due to the Covid 19 pandemic. The mapping results revealed that the dominance of red chilies and cayenne peppers presents an opportunity for development as a superior regional commodity. Strengthening chili production has the potential to increase farmer incomes, improve food access, and strengthen household food security. The research findings identified key commodities that can be developed to support household food security.

1 Introduction

The world population has increased compared to the previous year, with the largest population concentrated in Asian continent [1]. Indonesia is the fourth most populous country in the world, with over 260 million people. It also has a diverse ranger of cultures and divided

* Corresponding author: rosalina.kumalawati@ulm.ac.id

into 34 provinces [2]. This diversity affects demographic condition in each region, where population data play an important role in development planning. Demographic conditions vary across regions, influencing regional development [3]. These conditions can be observed through population size, population growth rate and population density. Populations continue to grow in both developed and developing countries. This population increase can be attributed to high fertility rates, which are influenced by overall health conditions of the population [4].

An increase in population will be typically accompanied by an increase in population growth rate and population density[5]. Indonesia has also experienced population growth, including in South Kalimantan, which is projected to increase from 2023 to 2025 (see Table 1). As the gateway and support region for the National Capital, South Kalimantan is expected to see further population growth. Which will lead to higher food demand. Increasing food demands has a significant impact on population growth [6].

Table 1. Population Projections by Regency/City and Gender in South Kalimantan

District	Population Projections by Regency/City and Gender (Thousand People)								
	Male			Female			Total		
	2023	2024	2025	2023	2024	2025	2023	2024	2025
South Kalimantan	**2135,7**	**2160,69**	**2185**	**2086,63**	**2112,71**	**2138,33**	**4222,33**	**4273,4**	**4323,33**
Tanah laut	184,7	186,62	188,46	176,22	178,37	180,45	360,93	364,98	368,91
Kotabaru	174,64	176,8	178,93	164,42	166,88	169,32	339,06	343,68	348,25
Banjar	298,63	303,1	307,5	292,88	297,54	302,14	591,51	600,64	609,64
Barito Kuala	165,31	167,67	170	160,97	163,32	165,65	326,28	330,99	335,65
Tapin	99,3	100,48	101,63	97,17	98,39	99,57	196,47	198,87	201,2
Hulu Sungai Selatan	118,57	120	121,4	117,42	118,78	120,13	235,98	238,78	241,53
Hulu Sungai Tengah	133,93	135,24	136,5	132,26	133,51	134,73	266,2	268,75	271,23
Hulu Sungai Utara	117,31	118,67	119,98	117,21	118,44	119,66	234,51	237,11	239,64
Tabalong	133,55	135,27	136,95	129,85	131,62	133,35	263,4	266,89	270,3
Tanah Bumbu	172,7	175,1	177,44	164,64	167,26	169,82	337,33	342,36	347,26
Balangan	68,82	69,83	70,82	67,29	68,28	69,28	136,12	138,12	140,09
Kota Banjarmasin	333,56	334,61	335,51	332,88	334,15	335,33	666,44	668,76	670,84
Kota Banjarbaru	134,69	137,3	139,88	133,41	136,17	138,92	268,11	273,47	278,8

Food is a primary and essential human need, when it is sufficient, people can live healthily and can carry out daily activities to meet their living requirements [7; 8]. Food becomes a critical issues if it does not receive serious attention from the government, as it is a basic necessity for every human being [9]. Food consists of both plant-based (10 commodities) and animal-based (5 commodities) products [30], including food crops, fruit and vegetable horticulture [10; 11]. The demand for food crops, particularly vegetables, is increasing, as can reflected in the expansions of harvested areas (see Table 2). The increase in harvested areas is projected to be significant from 2019 to 2022, with the most substantial growth growth expected in 2021 and 2022. Barito Kuala Regency, which is designated as food estate and serves as the rice granary of South Kalimantan, is also expected to experience a considerable population increase from 2023 to 2025.

Table 2. Vegetable Commodity Harvest Area in South Kalimantan 2019-2022

Commodity	**Harvest Area**			
	2019	**2020**	**2021**	**2022**
Spring Onion	405	388	404	471
Onio	186	89	73	47
Garlic	1	0	0	0
Spinach	528	532	606	638
Cantaloupe	0	0	0	0
Beans	352	371	402	454
Big Chili	1.638	1.476	1.048	904
Cayenne Pepper	2.428	2.329	2.070	2.111
Mold	33.310	38.956	4.921	6.873
Red Beans	0	0	0	0
Long Beans	1.013	1.008	993	902
Water Spinach	457	593	654	667
Cauliflower	20	24	9	13
Potato	0	0	0	0
Cucumber	758	753	804	783
Cabbage	7	2	3	0
Chayote	0	0	0	0
Turnip	0	0	0	0
Paprika	0	0	0	0
Petsai	404	467	518	571
Eggplant	1.062	987	1.022	993
Tomato	842	868	710	43.031
Wortel	0	0	0	0
Carrot	43.411	48.843	14.237	58.458

Population growth is a natural phenomenon that can influence the social and cultural activities of society. An increasing number of people affects the fulfillment of needs, which rises alongside population growth [12]. This has both direct and indirect impacts, including a potential decrease in harvested area. A reduction in harvested area will, in turn, affect total production. It is hoped that harvested area and production levels will continue to increase alongside population growth to prevent future food crisis, including a vegetable shortages. Vegetables are particularly important as the contain vitamins and minerals that support growth and maintain bodily health. By using mapping, it is possible to determine population distribution, vegetable horticulture production and the primary or superior commodities for each type of vegetable, allowing the identification of areas with potential for vegetable commodity development. A Geographic Information System (GIS) is capable of processing data related to geographic location or conditions.

Based on the background described above, it is important to conduct research title "Mapping Demographic Conditions and Vegetable Horticultural Production to support Household Food Security". Household food security refers to a condition which a household's food need are met, as reflected in the availability of sufficient food in terms of quantity and quality, which is safe, equitable and affordable . The findings of this study reveal the demographic conditions and vegetable horticultural production that can support household food security. In addition, this research allow the identification of vegetable horticulture commodities that have the potential to be developed, contributing to the improving of household economic conditions.

2 Methods

The research was conducted in Barito Kuala Regency, which serves as a food estate and rice granary in South Kalimantan. The research method employed is descriptive quantitative. Descriptive quantitative research is a method that describes variables as they are, supported by numerical data derived actual situations [13]. Data collection utilized both secondary and primary data. Secondary data were obtained from Provincial and regency sources, including *BPS (Badan Pusat Statistik)* publications, demographic data (population size, population growth, population density), production data and vegetable horticulture harvest area. Primary data were collected through filed observations. The population in this study includes all demographic data from 2015 to 2024, as well as all vegetable horticultural commodities in 2024. The analysis technique used statistical and spatial analysis. Spatial analysis employed to determine relationships between sub-district, which are then used for mapping demographic conditions and vegetable horticultural production to support household food security (see Figure 1). Statistical analysis id applied to calculate demographic condition and to analyze the distribution of vegetable horticulture commodities across regiions [14].

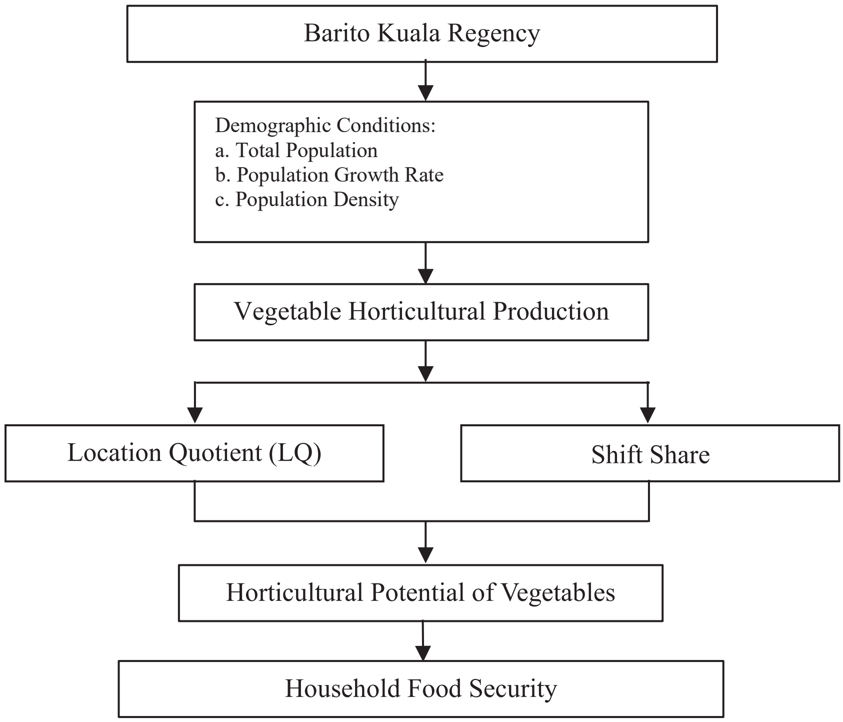

Fig. 1. Research Flow Diagram

3 Result and Discussion

3.1 Demographic Conditions

Demography is the science that studies population or humans, including population data such as population size, population growth and population density. It also examines how population changes over time due to births, deaths, migration and aging. Demographic conditions in Barito Kuala Regency, including population, population growth and population density from 2015 to 2024 vary considerably across its sub-district (see Tables 3; 4 and 5). The population continued to increase each year from 2015 to 2020; however, there was decline in 2021, followed by an increase again from 2022 to 2024. The lowest population in 2024 were in Kuripan (6,129) and Jejangkit (6,892) Districts (see Table 3).

Jejangkit District's population growth is projected to be negative in 2024, indicating that deaths will outnumber births (see Table 4). The negative population growth (-0.14) and low population density in Jejangkit District are influenced by several factors, including fertility, mortality and migration. Apart from Jejangkit District, Kuripan District has the lowest population density (see Table 5). Low population density can affect the amount of food required by households in the sub-district, including the demand for vegetables [61]. Household vegetable demands is expected to increase along with population, population growth and population density. A similar increase occurred in Barito Kuala Regency from 2015 to 2024, highlighting the need for serious attention to the supply of vegetable commodities to prevent that potential shortages in the future.

Table 3. Population of Barito Kuala Regency 2015-2024

Total Population	Subdistrict																	
	Tabunganen	Tamban	Mekarsari	Anjir Pasar	Anjir Muara	Alalak	Mandastana	Jejangkit	Belawang	Wanaraya	Baramb ai	Rantau Badauh	Cerbon	Bakumpai	Marabahan	Tabukan	Kuripan	**TOTAL**
2015	20.657	32.081	17.238	16.097	20.735	55.338	15.182	6.439	13.584	13.050	14.960	14.955	8.958	9.986	20.606	8.641	5.602	**294.109**
2016	20.952	32.449	17.460	16.276	21.001	56.339	15.426	6.543	13.765	13.204	15.161	15.157	9.067	10.121	20.929	8.747	5.685	**298.282**
2017	21.332	32.801	17.674	16.450	21.256	57.312	15.664	6.645	13.936	13.353	15.355	15.353	9.168	10.250	21.243	8.846	5.766	**302.304**
2018	21.503	33.137	17.883	16.617	21.497	58.259	15.898	6.745	14.101	13.496	15.546	15.541	9.266	10.373	21.547	8.942	5.844	**306.195**
2019	21.768	33.464	18.089	16.782	21.736	59.190	16.128	6.844	14.265	13.639	15.732	15.725	9.362	10.493	21.846	9.032	5.921	**310.016**
2020	22.013	33.765	18.284	16.935	21.954	60.073	16.348	6.939	14.416	13.770	15.911	15.897	9.449	10.602	22.129	9.116	5.994	**313.595**
2021	20.045	31.967	17.797	17.013	21.918	62.833	17.497	6.606	13.627	14.342	15.672	16.464	9.969	10.537	21.915	9.030	5.789	**313.021**
2022	20.138	32.057	17.951	17.182	22.177	64.080	17881	6.664	13.721	14547	15.850	16.712	10137	10.665	22.235	9.128	5.838	**316.963**
2023	20.280	32.230	18.150	17.400	22.490	65.510	18.32	6.740	13.850	14.790	16.070	17.010	10.330	10.820	22.620	9.250	5.900	**321.770**
2024	20.987	32.925	18.633	17.754	23.301	63.000	18172	6.892	14.406	15033	16.405	17.142	10.242	11.120	22.832	9529	6.129	**32.4502**

Table 4. Population Growth Rate of Barito Kuala Regency 2015-2024

Total Population	Subdistrict																	
	Tabunganen	Tamban	Mekarsari	Anjir Pasar	Anjir Muara	Alalak	Mandastana	Jejangkit	Belawang	Wanaraya	Baramb ai	Rantau Badauh	Cerbon	Bakumpai	Marabahan	Tabukan	Kuripan	**TOTAL**
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2016	1,43	1,15	1,29	1,11	1,28	1,81	1,61	1,62	1,33	1,18	1,34	1,35	1,22	1,35	1,57	1,23	1,48	**1,42**

2017	1,81	1,08	1,23	1,07	1,21	1,73	1,54	1,56	1,24	1,13	1,28	1,29	1,11	1,27	1,5	1,13	1,42	**1,35**
2018	1,28	1,02	1,18	1,02	1,13	1,65	1,49	1,5	1,18	1,07	1,24	1,22	1,07	1,2	1,43	1,09	1,35	**1,29**
2019	1,45	1,12	1,27	1,1	1,29	1,81	1,61	1,58	1,33	1,16	1,36	1,34	1,24	1,36	1,55	1,23	1,41	**1,41**
2020	1,42	1,1	1,25	1,08	1,26	1,77	1,58	1,56	1,3	1,14	1,33	1,31	1,2	1,32	1,52	1,2	1,39	**1,38**
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2023	0,68	0,47	1,14	1,28	1,49	2,41	2,66	1,15	0,94	1,78	1,45	1,87	2,08	1,53	1,82	1,38	1,11	**1,59**
2024	3,55	0,98	2,08	1,49	1,49	4,36	1,68	-0,14	1,62	1,7	0,89	1,4	0,87	1,91	1,31	1,91	1,26	**2,09**

Table 5. Population Density of Barito Kuala Regency 2015-2024

Subdistrict	Population Density				
	2015	2016	2017	2018	2019
Tabunganen	0	87,3	88,47	90	91
Tamban	0	197,5	199,64	202	204
Mekarsari	0	121,67	123,16	125	126
Anjir Pasar	0	129,17	130,56	132	133
Anjir Muara	0	179,88	182,06	184	186
Alalak	0	524,82	533,88	543	551
Mandastana	0	113,43	115,18	117	119
Jejangkit	0	32,23	32,73	33	34
Belawang	0	171,53	173,66	176	178
Wanaraya	0	352,11	356,08	360	364
Barambai	0	82,85	83,91	85	86
Rantau Badauh	0	57,89	58,64	59	60
Cerbon	0	44,01	44,5	45	45
Bakumpai	0	38,78	39,27	40	40
Marabahan	0	94,7	96,12	97	99
Tabukan	0	52,69	53,29	54	54
Kuripan	0	16,55	16,79	17	17
Barito Kuala	**0**	**99,53**	**100,87**	**102**	**103**

Table 5. Population Density of Barito Kuala Regency 2015-2024

Subdistrict	**Population Density**				
	2020	**2021**	**2022**	**2023**	**2024**
Tabunganen	91,72	83,52	83,91	85	87,45
Tamban	205,51	194,56	195,11	196	200,4
Mekarsari	127,41	124,02	125,09	126	129,85
Anjir Pasar	134,4	135,02	136,37	138	140,9
Anjir Muara	188,04	187,73	189,95	193	199,58
Alalak	559,6	588,05	599,72	613	589,61
Mandastana	120,21	128,65	131,48	135	133,62
Jejangkit	34,18	32,54	32,83	33	33,95
Belawang	179,64	169,81	170,98	173	179,51
Wanaraya	367,2	382,45	387,92	394	400,88
Barambai	86,95	85,64	86,61	88	89,64
Rantau Badauh	60,72	62,89	63,83	65	65,47
Cerbon	45,87	48,39	49,21	50	49,72
Bakumpai	40,62	40,37	40,86	41	42,61
Marabahan	100,13	99,16	100,61	102	103,31
Tabukan	54,92	54,4	54,99	56	57,4
Kuripan	17,45	16,85	17	17	17,84
Barito Kuala	**104,64**	**104,46**	**105,78**	**107**	**108,3**

3.2 Vegetable Horticulture Production

Vegetable production in Barito Kuala Regency continued to increase from 2015 to 2024, although there were periods of significant decreases and increases. Agricultural production can be influenced by the use of marginal land, which allows the cropping index to increase from one to two planting seasons per year [15]. A significant increase occurred from 2019 (11,734) to 2020 (15,036), which coincided with the Covid-19 pandemic, leading to an extraordinary rise in vegetables demand to boost immunity. From 2021 (5,042) to 2023 (3,568), production experienced another decline as the Covid-19 pandemic began to subside, followed by an increase in 2024 (7,793) (see Table 6). Barito Kuala Regency has several vegetable commodities with production quantities that vary widely across sub-district. The highest production levels are observed for eggplant, tomatoes and spring onions; however, these are concentrated in limited number of sub-districts. Specifically, eggplant and tomato production was highest in Belawang and Wanaraya Districts, while leek production was highest in Wanaraya and Anjir Pasar Districts (see Table 7).

The demand for vegetable horticulture is expected continue increasing alongside population growth, population size, and population density, ensuring that vegetables needs are adequately met. The population growth requires attention, as the number people will continue to rise year by year. This increase is expected to continue in line with the development of the national capital, as South Kalimantan serves as a gateway and buffer zone for IKN, with Barito Kuala functioning as a food estate and granary. As a designated food estate and granary, Barito Kuala Regency is expected to be capable of meeting future food demands, including vegetable requirements.

Table 6. Vegetable Horticulture Production in Barito Kuala Regency 2015-2024

Subdistrict	**2015**	**2016**	**2017**	**2018**	**2019**
Tabunganen	0	0	0	0	0
Tamban	0	0	0	0	0
Mekarsari	0	0	0	0	0
Anjir Pasar	39	37	256	492	3.552
Anjir Muara	0	0	0	1	0
Alalak	0	2	3	2	0
Mandastana	22	21	25	20	123
Jejangkit	15	0	21	13	61
Belawang	1	8	0	0	0
Wanaraya	687	249	2.204	1.879	6.967
Barambai	4	2.249	28	4	91
Rantau Badauh	5	3	14	1	96
Cerbon	72	6	58	255	419
Bakumpai	1	159	0	1	17
Marabahan	67	0	188	246	382
Tabukan	13	188	4	1	3
Kuripan	0	2	1	0	20
Barito Kuala	**926**	**2.923**	**2.803**	**2.785**	**11.734**

Table 6. Vegetable Horticulture Production in Barito Kuala Regency 2015-2024

Subdistrict	2020	2021	2022	2023	2024
Tabunganen	7	27	22	7	4
Tamban	23	3	0	0	0
Mekarsari	0	0	0	0	0
Anjir Pasar	973	878	1.756	356	236
Anjir Muara	0	0	0	6	12
Alalak	4	90	11	52	82
Mandastana	321	446	143	427	368
Jejangkit	114	177	22	103	114
Belawang	0	0	0	613	3.939
Wanaraya	11.782	1.861	2.224	1.170	2.235
Barambai	289	82	103	128	26
Rantau Badauh	460	66	213	216	135
Cerbon	624	535	252	152	320
Bakumpai	4	97	55	44	28
Marabahan	338	830	712	199	228
Tabukan	154	0	151	100	67
Kuripan	0	0	18	0	6
Barito Kuala	**15.036**	**5.042**	**5.662**	**3.568**	**7.793**

Table 7. Total Vegetable Horticulture Production in Barito Kuala Regency

Subdistrict	Spring Onion	Onion	Garlic	Big Chili	Curly Chili
Tabunganen	0	0	0	0	0
Tamban	0	0	0	0	0
Mekarsari	0	0	0	0	0
Anjir Pasar	148	0	0	14	0
Anjir Muara	0	0	0	0	0
Alalak	0	0	0	17	52

Subdistrict	Spring Onion	Onion	Garlic	Big Chili	Curly Chili
Mandastana	0	0	0	258	0
Jejangkit	0	0	0	55	0
Belawang	60	0	0	47	0
Wanaraya	889	0	0	272	16
Barambai	0	0	0	14	0
Rantau Badauh	6	0	0	37	0
Cerbon	24	210	0	27	0
Bakumpai	7	0	0	2	0
Marabahan	50	0	0	27	0
Tabukan	0	0	0	26	0
Kuripan	0	0	0	0	0
Barito Kuala	**1.184**	**210**	**0**	**793**	**68**

Table 7. Total Vegetable Horticulture Production in Barito Kuala Regency

Subdistrict	Cayenne Pepper	Cabbage	Eggplant	Tomato	Potato	Total
Tabunganen	4	0	0	0	0	4
Tamban	0	0	0	0	0	0
Mekarsari	0	0	0	0	0	0
Anjir Pasar	41	0	22	11	0	236
Anjir Muara	12	0	0	0	0	12
Alalak	10	0	0	3	0	82
Mandastana	85	0	0	25	0	368
Jejangkit	56	0	1	2	0	114
Belawang	62	0	2.015	1.755	0	3.939
Wanaraya	415	0	357	286	0	2.235
Barambai	12	0	0	0	0	26
Rantau Badauh	74	0	9	9	0	135

Subdistrict	Cayenne Pepper	Cabbage	Eggplant	Tomato	Potato	Total
Cerbon	50	0	5	4	0	320
Bakumpai	15	0	1	3	0	28
Marabahan	51	0	59	41	0	228
Tabukan	22	0	19	0	0	67
Kuripan	5	0	1	0	0	6
Barito Kuala	**912**	**0**	**2.488**	**2.138**	**0**	**7.793**

3.3 Vegetable Horticulture Production

According to the FAO, food security must meet four components; adequate food availability, stability of food supply without seasonal or annual fluctuations, accessibility or affordability of food, and proper utilization of food. The availability and stability of food in district in Barito Kuala Regency can be assessed from production quantities in each sub-district (see Table 7). Stable and increasing production across sub-district, fairly evenly distributed across commodities, must be maintained, as fluctuations can occur at any time. Since the demand for vegetables continues to rise year to year, it is important to identify the primary or superior vegetable commodities that can be developed in each sub-district to support household food security.

Base commodities are those that have the potential to be continuously developed in the region, as indicated by the Location Quotient (LQ). In Barito Kuala Regency are, LQ analysis identifies several basic commodities across multiple sub-districts (see Tables 8, 9 and Figure 2). The most commonly found basic commodities in most sub-districts are Cayenne Pepper and Large Chili (see Figures 3, 4 and 5). These result indicate that Cayenne Pepper and Large Chili have significant potential for further development, contributing to the local economy. In addition to meeting the needs of each sub-district in Barito Regency, these commodities can also be marketed outside the region, thereby enhancing household food security. Consequently, the development of key vegetable horticulture commodities, such as cayenne pepper and large chili, is expected to support household food security in the future. To achieve this, collaboration among various stakeholders-including government, community and the private sector is necessary.

Table 8. Location Quotient (LQ) of Vegetable Horticulture in Barito Kuala Regency

Subdistrict	Spring Onion	Red Onion	Garlic	Big Chili	Curly Chilies
Tabunganen	0,00	0,00	0,00	0,00	0,00
Tamban	0,00	0,00	0,00	0,00	0,00
Mekarsari	0,00	0,00	0,00	0,00	0,00
Anjir Pasar	4,13	0,00	0,00	0,58	0,00
Anjir Muara	0,00	0,00	0,00	0,00	0,00
Alalak	0,00	0,00	0,00	2,04	72,68

Subdistrict	Spring Onion	Red Onion	Garlic	Big Chili	Curly Chilies
Mandastana	0,00	0,00	0,00	6,89	0,00
Jejangkit	0,00	0,00	0,00	4,74	0,00
Belawang	0,10	0,00	0,00	0,12	0,00
Wanaraya	2,62	0,00	0,00	1,20	0,82
Barambai	0,00	0,00	0,00	5,29	0,00
Rantau Badauh	0,29	0,00	0,00	2,69	0,00
Cerbon	0,49	24,35	0,00	0,83	0,00
Bakumpai	1,65	0,00	0,00	0,70	0,00
Marabahan	1,44	0,00	0,00	1,16	0,00
Tabukan	0,00	0,00	0,00	3,81	0,00
Kuripan	0,00	0,00	0,00	0,00	0,00

Table 8. Location Quotient (LQ) of Vegetable Horticulture in Barito Kuala Regency

Kecamatan	Cayenne Papper	Cabbage	Eggplant	Tomato	Potato
Tabunganen	8,54	0,00	0,00	0,00	0,00
Tamban	0,00	0,00	0,00	0,00	0,00
Mekarsari	0,00	0,00	0,00	0,00	0,00
Anjir Pasar	1,48	0,00	0,29	0,17	0,00
Anjir Muara	8,54	0,00	0,00	0,00	0,00
Alalak	1,04	0,00	0,00	0,13	0,00
Mandastana	1,97	0,00	0,00	0,25	0,00
Jejangkit	4,20	0,00	0,03	0,06	0,00
Belawang	0,13	0,00	1,60	1,62	0,00
Wanaraya	1,59	0,00	0,50	0,47	0,00
Barambai	3,94	0,00	0,00	0,00	0,00
Rantau Badauh	4,68	0,00	0,21	0,24	0,00
Cerbon	1,34	0,00	0,05	0,05	0,00

Kecamatan	Cayenne Papper	Cabbage	Eggplant	Tomato	Potato
Bakumpai	4,58	0,00	0,11	0,39	0,00
Marabahan	1,91	0,00	0,81	0,66	0,00
Tabukan	2,81	0,00	0,89	0,00	0,00
Kuripan	7,12	0,00	0,52	0,00	0,00

Table 9. Basic Vegetable Horticulture Commodities in Barito Kuala Regency

Subdistrict	Spring Onion	Red Onion	Garlic	Big Chili	Curly Chilies
Tabunganen	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Tamban	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Mekarsari	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Anjir Pasar	Base	Non-Base	Non-Base	Non-Base	Non-Base
Anjir Muara	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Alalak	Non-Base	Non-Base	Non-Base	Base	Base
Mandastana	Non-Base	Non-Base	Non-Base	Base	Non-Base
Jejangkit	Non-Base	Non-Base	Non-Base	Base	Non-Base
Belawang	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Wanaraya	Base	Non-Base	Non-Base	Base	Non-Base
Barambai	Non-Base	Non-Base	Non-Base	Base	Non-Base
Rantau Badauh	Non-Base	Non-Base	Non-Base	Base	Non-Base
Cerbon	Non-Base	Base	Non-Base	Non-Base	Non-Base
Bakumpai	Base	Non-Base	Non-Base	Non-Base	Non-Base
Marabahan	Base	Non-Base	Non-Base	Base	Non-Base
Tabukan	Non-Base	Non-Base	Non-Base	Base	Non-Base
Kuripan	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base

Table 9. Basic Vegetable Horticulture Commodities in Barito Kuala Regency

Subdistrict	Cayenne Papper	Cabbage	Eggplant	Tomato	Potato
Tabunganen	Base	Non-Base	Non-Base	Non-Base	Non-Base
Tamban	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Mekarsari	Non-Base	Non-Base	Non-Base	Non-Base	Non-Base
Anjir Pasar	Base	Non-Base	Non-Base	Non-Base	Non-Base
Anjir Muara	Base	Non-Base	Non-Base	Non-Base	Non-Base
Alalak	Base	Non-Base	Non-Base	Non-Base	Non-Base
Mandastana	Base	Non-Base	Non-Base	Non-Base	Non-Base
Jejangkit	Base	Non-Base	Non-Base	Non-Base	Non-Base
Belawang	Non-Base	Non-Base	Base	Base	Non-Base
Wanaraya	Base	Non-Base	Non-Base	Non-Base	Non-Base
Barambai	Base	Non-Base	Non-Base	Non-Base	Non-Base
Rantau Badauh	Base	Non-Base	Non-Base	Non-Base	Non-Base
Cerbon	Base	Non-Base	Non-Base	Non-Base	Non-Base
Bakumpai	Base	Non-Base	Non-Base	Non-Base	Non-Base
Marabahan	Base	Non-Base	Non-Base	Non-Base	Non-Base
Tabukan	Base	Non-Base	Non-Base	Non-Base	Non-Base
Kuripan	Base	Non-Base	Non-Base	Non-Base	Non-Base

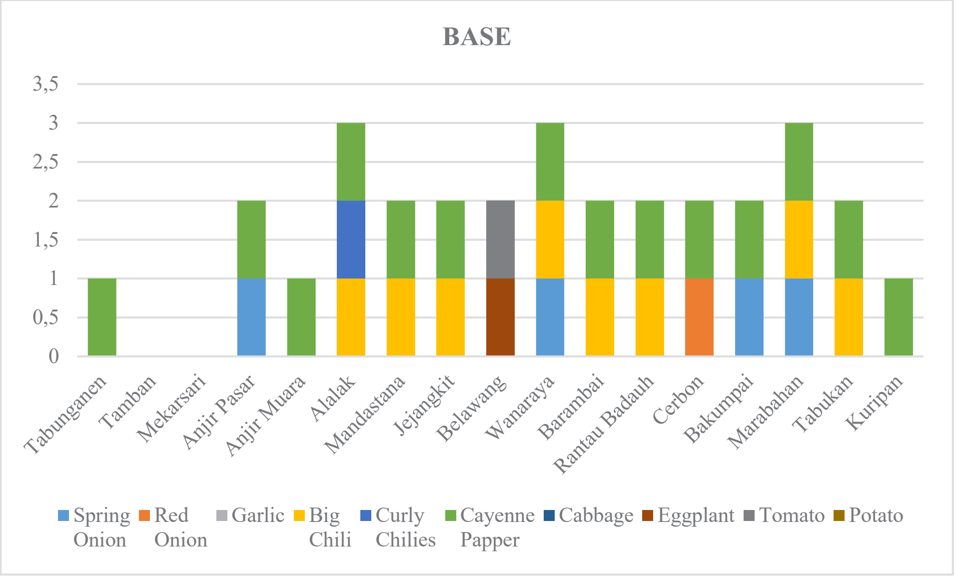

Fig. 2. Basic Commodities in Each District in Barito Kuala Regency

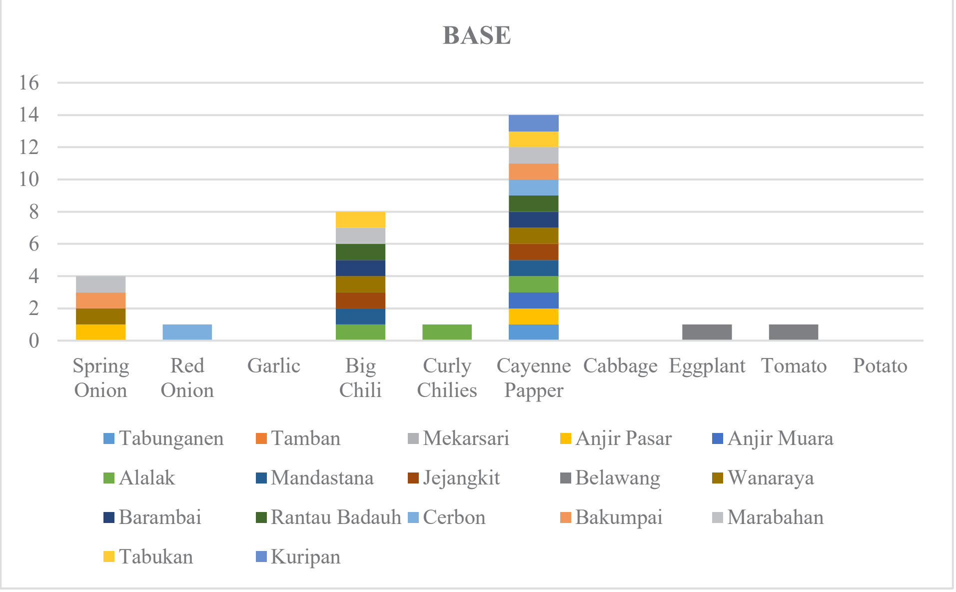

Fig. 3. Number of Basic Commodities in Each District in Barito Kuala Regency

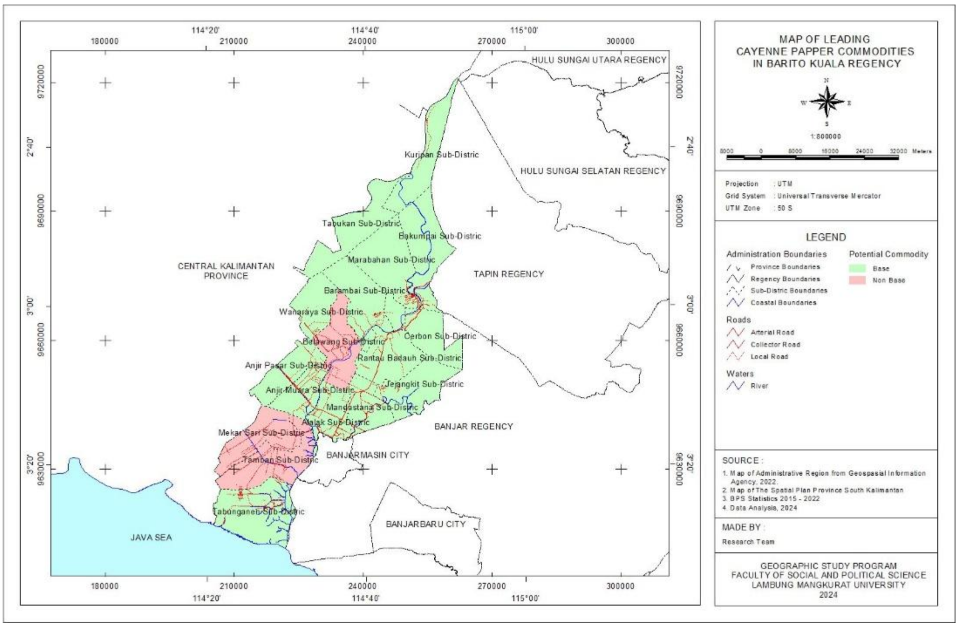

Fig. 4. Map of the Leading Commodity of Cayenne Papper in Barito Kuala Regency

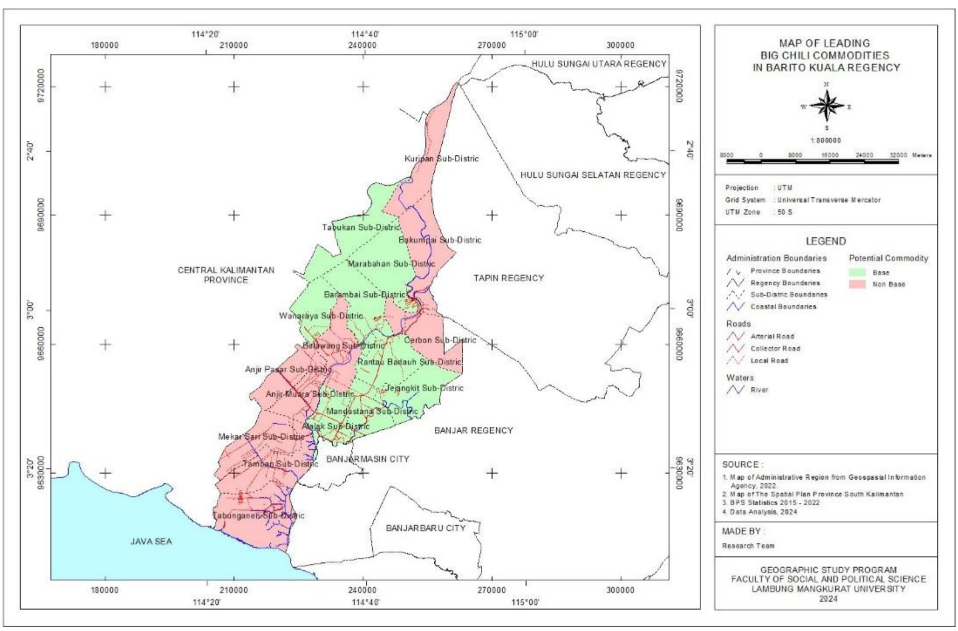

Fig. 5. Map of Leading Large Chili Commodities in Barito Kuala Regency

Population, population growth and population density in Barito Kuala Regency fluctuate between 2015 and 2024, but overall showed an increasing trend. Household vegetable demands is expected to rise in line with increases in population. Household vegetable demand is expected to rise in line with increases in population, population growth, and population density, as observed in Barito Kuala Regency. Vegetable horticulture production in the regency has also continued to increase over the same period, despite occasional declines. The substantial increase from 2019 to 2020 may be attributed to the COVID-19 pandemic. The most commonly produced basic commodities across sub-districts are cayenne pepper and large chili. These two commodities have significant potential for further development, which can support the local economy and enhance household food security.

4 Conclusion

1. Demographic conditions in Barito Kuala Regency continue to grow, leading to an increasing household demand for vegetable commodities.
2. Vegetable horticulture production exhibits fluctuations but generally shows an upward trend, with a significant increase observed during the Covid-19 pandemic.
3. Production distribution across subdistricts is uneven, with certain areas functioning as key production centers.
4. Location Quotient (LQ) analysis identifies Cayenne Pepper and Large Chili as the dominant base commodities. These commodities have strong potential to be developed as regional superior products
5. Vegetable production must keep pace with the rising demand driven by population growth.
6. Strengthening the horticulture sector can enhance household food security and support local economic development.

Acknowledgment. We would like to thank Universitas Lambung Mangkurat for funding this research through an Internal Grant (PNBP). This study was classified as Fundamental Research based on 2025 selection results.

References

1. B. A. Pratiwi, N. Wati, O. Oktarianita, W. Angraini, and M. B. Raharja, Fertility Based on Demographic and Social Economic Factors in Women of Reproductive Age in Bengkulu Province (Secondary Data Analysis 2017 IDHS). JBK, **12**, 1, 41–51, (Jul. 2023). https://doi.org/10.20473/jbk.v12i1.2023.41-51
2. S. Kistiana and A. A. . Baskoro, Modern Contraceptive Use Among Urban And Rural Young Married Women In Indonesia. JBK, **12**, 2, 186–198, (Nov. 2023). https://doi.org/10.20473/jbk.v12i2.2023.186-198
3. K. Dewi, Analisis Demografi dan Kewilayahan Banyuwangi dengan Pendekatan HINCO untuk Pengembangan Wilayah. DEMOS: J. of Demo., Ethno. and Soc. Trans., **1**, 1, 24-34 (2021). https://doi.org/10.30631/demos.v1i1.1025
4. N. Y. Kartika, F. M. Farid, and N. A. Azizah, Fertility And Pregnancy During The Pandemic At The Dayak Meratus Tribe", JBK, **13**, 1, 51–60, (Jul. 2024). https://doi.org/10.20473/jbk.v13i1.2024.51-60
5. L. R. Ranti, A. Astrid, D. Yanti, and Y. Barella, Pengaruh Pertumbuhan Penduduk dan Pertumbuhan Ekonomi Terhadap Tingkat Pengangguran di Kota Pontianak. JUPENDIS, **2**, 3, 222–235, (Jun. 2024). https://doi.org/10.54066/jupendis.v2i3.2032
6. Y. Sari, Z. Lubis, E. H. Khardinata, Analisis ketersediaan dan kebutuhan beras di Provinsi Sumatera Utara. AGRISAINS: Jurnal Ilmiah Magister Agribisnis, **2**, 1, 71-80, (2020). https://doi.org/10.31289/agrisains.v2i1.256
7. L. Lasminingrat and E. Efriza, Pembangunan lumbung pangan nasional: Strategi antisipasi krisis pangan indonesia. Jurnal Pertahanan dan Bela Negara **10**, 3, 243-260 (2020). https://doi.org/10.33172/jpbh.v10i3.1053

8. L. Hulu and M. H. Thamrin, Pengelolaan Cadangan Pangan Masyarakat Melalui Lumbung Pangan Di Kabupaten Deli Serdang. JKAKP, **1**, 2, 1–7, (Oct. 2022). https://doi.org/10.32734/jkakp.v1i2.9143
9. R. Njatrijani, Pengawasan Keamanan Pangan. Law, Development and Justice Review. **4**, 1, 12-28, (May. 2021). https://doi.org/10.14710/ldjr.v4i1.11076
10. B. Umasugi, A. Teapon and S. Sudjud, Pangan dalam kebun, model pertanian petani kepulauan: Analisis karakteristik lahan dan pendapatan petani Pulau Ternate. Agro Bali: Agricultural J., **5**, 2, 2022 (2022). https://doi.org/10.37637/ab.v5i2.953
11. R. J. Sahri, et al. Tanaman pangan sebagai sumber pendapatan petani di Kabupaten Karo. Jurnal Inovasi Penelitian **2**, 10, 3223-3230 (2022). https://doi.org/10.47492/jip.v2i10.1348
12. N. Z. M. N. Rashid, et al., Effects of agricultural grade nutrient modulation on the biomass production and carbon fixation rate of Isochrysis sp. microalgae. Asian J. of Agric. and Rur. Dev., **13**, 4, 248-256 (2023). https://doi.org/10.22004/ag.econ.342419
13. H. Syahrizal and M. S. Jailani, Jenis-Jenis Penelitian Dalam Penelitian Kuantitatif dan Kualitatif. JQ, **1**, 1, 13–23, (May 2023). https://doi.org/10.61104/jq.v1i1.49
14. R. B. Utami, Analisis pengaruh angka beban ketergantungan, kepadatan penduduk, garis kemiskinan terhadap indeks gini di indonesia. Med. Tech. and Pub. Health J. **4**, 2, 212-223 (2020). https://doi.org/10.33086/mtphj.v4i2.806
15. W. Taena, B. P. . Sipayung, F. M. A. . Blegur, and A. D. Klau, Impact of agricultural infrastructure development on inequality and optimization equality of farmers' income in Indonesia-Timor Leste Border Area. Asian J. of Agri. and Rural Dev., **13**, 4, 269-276 (2023).https://doi.org/10.55493/5005.v13i4.4933