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The impacts of rapid urbanization in the rural-urban fringe area: The Case in the Province of Cavite, Philippines

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Abstract

People living in the rural-urban fringe areas face opportunities and challenges as a result of the urban expansion. Urbanization in the areas is seen by the rise in the number of commercial centres, residential subdivisions, and industrial and technology establishments which pose employment opportunities and income generation to the local people. However, the extended economic activities in urban areas into rural-urban fringe areas, will put pressures on the latter's agricultural lands and will become a crucial area for sustainable urbanization. It poses challenges for locals who must meet their basic needs while also adjusting to the effects of land use conversion and population growth, which put a significant pressure on the environment, social services, and existing infrastructure. This paper will attempt to analyse the impacts of urbanization in socio-economic outcomes and the environment, and how it alters the agricultural landscapes in the rural-urban fringe area, the Province of Cavite, Philippines. Additionally, it will investigate the local government's initiatives/policies/strategies to implement urban sustainability and how it addresses the pressures brought by urbanization in the province.

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List of acronyms

BPO – Business Process Outsourcing

CaLaBaRZon – CAvite, LAGuna, BAatangas, Rizal, and QueZON

CEZ – Cavite Economic Zone

DE – Doughnut Economics

GDP – Gross Domestic Product

IT – Information Technology

JMA – Jabodetabek Metropolitan Area

LGU – local government unit

NCR – National Capital Region

PUA – peri-urban agriculture

PDPFP – Provincial Development and Physical Framework Plan

1. Introduction

Our societies are facing several challenges as a result of the world's expanding urbanization. More than 4 billion of the world's population live in urban areas (Ritchie & Roser, 2018). Urbanization is a process that leads to the growth of cities due to industrialization and economic development, and that leads to urban-specific changes in specialization, labour division and human behaviours (Uttara et al., 2012, p. 1638). In 2018, as a result of rapid urbanization worldwide, more than half of the population lived in urban areas (Ritchie & Roser, 2018). The UN Department of Economic and Social Affairs Population Dynamics defines urbanization as a complex socio-economic process that transforms the built environment, converting formerly rural into urban settlements, while also shifting the spatial distribution of a population from rural to urban areas. It includes changes in dominant occupations, lifestyle, culture and behaviour, and thus alters the demographic and social structure of both urban and rural areas. A major consequence of urbanization is a rise in the number, land area and population size of urban settlements and in the number and share of urban residents compared to rural dwellers. (DESA, 2019, p. iii).

Moreover, Malaque III and Yokohari (2007) argued that even urban peripheral locations are considered urban because of their proximity to urban centres consisting of great agricultural land that could become potential places for urban development. As urbanization created numerous challenges from local to global scale, it has been a high concern for many researchers to conduct studies with the aim of better understanding the problems associated with urbanization and its effects on environments (Regmi, 2017). However, due to the rapidly growing urban population, the nearby provinces run the possibility of encountering the same difficulties in urban areas. According to Aggrey Daniel Maina Thuo (2013), the rural-urban fringe is directly impacted by city growth, posing new opportunities and problems for residents who must meet their basic requirements while also adjusting to the consequences of land use change and the effects of population growth that severely strains the environment and the social services and infrastructure that are already in place. Even urban peripheral locations are considered urban because of their proximity to urban centres consisting of great agricultural land could become potential places for urban development (Malaque III & Yokohari, 2007).

A previous qualitative research study provides insights regarding the benefits and drawbacks of urbanization on land use planning, livelihood, and the environment at rural-urban fringes (Thuo, 2013). The study's findings demonstrated how land conversion on Nairobi's rural-urban fringe is causing changes in the area's social, cultural, economic, and environmental conditions. While some changes result in an improvement in the standard of living for a number of actors, other changes are deceptive because residential land developments are not supported by corresponding investments in social and physical infrastructure like roads, security, water supply, sewerage systems, and other public utilities, which in turn led to environmental problems like water pollution, soil erosion, waste generation, and the loss of vegetation cover. This was supported by the previous studies of Nhung Pham Thi and colleagues (2021) on which they revealed that following the national industrialization and urbanization strategy's implementation for more than two decades, a large portion of Vietnam's rural areas have swiftly become peri-urban or urban areas as a result of urbanization, and the livelihoods of rural people have gradually shifted to the non-farming sector. Their researched found that the main driver of urbanization was the rise in non-agricultural jobs in cities (Pham Thi et al., 2021). It demonstrates how farming is eroding in value and relevance as a source of income for rural households in Vietnam. These two pervious works have shown evidence that as more urban land development encroaches into formerly rural areas, it can have a negative effect on the environment of nearby countryside or even people who live outside the cities.

According to numerous studies (Pribadi & Pauleit, 2015); (Zezza & Tasciotti, 2010), sustaining and expanding peri-urban agriculture (PUA) is one approach to decrease the negative effects of urbanization. In the case in Japan, the development of PUA has been mentioned as a necessary solution for sustainable urban development. A new conceptual framework known as "*Satoyama*", which refer to "*dynamic mosaics of managed socio-ecological systems that produce a bundle of ecosystem services for human well-being*" (Moreno-Peñaranda, 2011). Moreno-Peñaranda added that in peri-urban areas, *Satoyama* landscapes should be structured to develop into significant hubs for agro-ecological production that can meet urban needs for food, energy, and cultural amenities while reviving the local economy, particularly in regions with dwindling populations. Didit Okta Pribadi and Stephan Pauleit (2015) made an effort to look into PUA dynamics as a reaction to growing urbanization in Jakarta's Jabodetabek Metropolitan Area (JMA).

Based on their study, PUA increases food security during times of crisis while also giving farmers and peri-urban residents an opportunity for jobs and to gain income. It was made clear that urban growth plans that simply ignore the PUA endanger not just the livelihood of many peri-urban residents and farmers, but also make the JMA more susceptible to rising food prices and natural disasters (Pribadi & Pauleit, 2015). Similar case in other developing country like Vietnam, PUA increases and diversifies home income, lowers economic risk, assures food security, and creates employment options for family laborers who are unable to obtain new off-farm occupations after the acquisition of agricultural land (Pham Thi et al., 2021). However, governments continue to exclusively focus on promoting the economy despite significant social and environmental challenges since cities, and particularly Asian megacities, are the engines of economic growth (Pribadi & Pauleit, 2015). Urbanization is frequently seen by local and state decision-makers as an opportunity for regional economic growth. The local governments benefit from land conversion through higher budgetary revenue, enhanced physical infrastructure, and other advantages (Wasilewski & Krukowski, 2002).

In the case of the Philippines, a previous work of Malaque III and Yokohari (2007) discusses the physical changes to the urban fringe agricultural landscape of Metro Manila which is the Province of Cavite, as well as the social pressures and other reasons that contributed to these changes. Malaque III and Yokohari (2007) have gathered an unpublished secondary data obtained from the National Statistics Office during their research in 2000–2003. From the said data, the province of Cavite has seen net migration from Metro Manila, increasing from 24,406 between 1975 and 1980 to 29,970 between 1985 and 1990. Additionally, Cavite's population significantly rose from 771,320 in 1980 to 1,610,324 in 1995. Its most recent average growth rate was 3.97% annually from 2015 to 2020 (Provincial Development Council, 2022). Malaque III and Yokohari (2007) argued that even urban fringe areas fabricated of prime agricultural land, it can become locations for expanding urban development due to their proximity to urban centres. It has been previously research that the nearby country sides of Metro Manila such as Rizal, Bulacan, Batangas, and Cavite are experiencing massive migration due to its proximity to Metro Manila (Magno-Ballesteros, 2000).

It can be observed the rapid migration of populations into towns and cities in many countries. Thus, reflect the usual indication of urbanization is migration of populations from rural to

urban areas (Ritchie & Roser, 2018). In this thesis, I will investigate the impacts of internal migration from urban to rural-urban fringe areas, focusing on the internal migration from Metro Manila to the Province of Cavite. This thesis will argue that due to the extended economic activities in urban areas into rural-urban fringe areas, the latter will become a crucial area for sustainable urbanization and will put pressures on agricultural lands. Thus, it is worth investigating the local government's initiatives/policies to implement urban sustainability and how it addresses those pressures. Using the Provincial Development and Physical Framework Plan of the Province of Cavite (PDPFP), I will analyse unto what extent it has a significant effect on supporting and implementing those initiatives/policies. Lastly, I will analyse to what extent that those initiatives/policies align with Doughnut Economics (DE) thinking.

Therefore, my main research question will be:

How does internal migration from urban areas to rural-urban fringe areas affect the socio-economic outcomes and environment in rural areas?

To answer my main research question, I will divide it to sub-research questions:

- 1. How does the urbanization in the Province of Cavite pose challenges and opportunities to the people living in the province?*
- 2. How does urbanization alter the province's agricultural landscape?*
- 3. What are the local government's initiatives/policies/adaptive strategies developed to support urban sustainability?*

2. Methodology

Data and details required for the study were gathered from relevant literatures. In addition, key concepts, background information, and a case study are covered to illustrate my analysis and discussion. Data was gathered from secondary sources such as published literatures, e.g., research papers, online articles, reports, journals, and online statistic reports. In addition, I

have collected secondary data through personal visit in the Cavite Provincial Capitol, Provincial Planning and Development Office. This thesis, out of necessity, mainly depends the discussion on the province's latest framework, entitled, "*Disaster Risk Reduction and Climate Change Adaptation (DRR-CCA) Enhanced Provincial Development and Physical Framework Plan (PDPFP) 2021-2030 Province of Cavite*" because it is newest framework that the province has been using. They have allowed me to scan through it and take pictures of some pages of the book. I was made aware that the PDPFP was just recently approved last October 8, 2022, by the Department of Human Settlements and Urban Development, thus it was not available online.

I have decided to structure my thesis to focus on one case study which I will investigate and examine the data and information I gathered through literature review and data obtained from the Provincial Capitol of Cavite. In my discussion and analysis section, I will further explore the province's PDPFP and I want to apply the usefulness of the DE framework based on the guidelines and models that Raworth have presented on her DE.

I mainly chose this topic for my Bachelor Thesis because of my personal experience of the impact of urbanization in the Province of Cavite. Furthermore, I have been traveling from Metro Manila (urban areas) to the Province of Cavite (rural-urban fringe areas) and I have experience and see the polluted air and water, and the long and congested traffic because of massive numbers of private and public cars and because of the under repair of bridges and roads. Lastly, I chose this topic because I have personal relationship to the country of my Philippines as it is my home country.

3. Theoretical Framework

There are many distinct reasons that contribute to urbanization and its expansion, such as rural-urban migration, natural population growth, and annexation. The primary causes of rising levels of urbanization are rural-urban migration, the geographic expansion of urban areas through annexations, and the transformation and reclassification of rural villages into small urban settlements because rates of natural increase are typically slightly lower in urban than in rural areas (Cohen, 2006, p. 96). Desakota, an Indonesian term that expresses "*desa*"

meaning village and “*kota*” meaning city, is how McGee (1991 as cited in Pribadi & Pauleit, 2015) characterizes places in Indonesia with such mixed land use.

Urban growth in developing countries has typically been linked to the physical expansion of metropolitan areas (Cohen, 2006). In Asian context, due to labour intensive agricultural operations like the production of rice, expanded metropolitan regions frequently penetrate significant agricultural areas in developing peri-urban zones that already have substantial rural populations (Pribadi & Pauleit, 2015). Asian urbanization has been characterized by the economic transition of densely populated areas from agricultural to non-agricultural activities as opposed to a significant rural-to-urban migration (Sui and Zeng 2001 as cited in Yokohari, et al., 2017).

3.1 Modernization theory of urbanization

Having defined what is meant by urbanization and peri-urban fringe, I will now discuss urbanization through the lens of modernization theory. In the middle of the 20th century, modernization theory was proposed. The process of moving from the traditional societies of the past to the modern societies found in the west is known as modernization. According to Christian Tetley (2005), this theory indicates that low-income countries will see a strengthening of their economies and move toward development if they adopt modern techniques of production, such as using cutting-edge technology for manufacturing. It is argued that migration between rural and urban areas and the process of structural change have been connected empirically. With the increased earnings and a shift away from agricultural work, urbanization is anticipated to continue to grow (Ritchie & Roser, 2018). York Bradshaw (1987) argues that there is a positive relationship between rapid urbanization and economic growth since cities contain modernizing institutions and all of them instil modern values that support economic development. According to him, rapid urbanization is a desirable feature that ought to be promoted. This notion is supported by modernization theory because it has been determined that industry is the primary driver of urbanization. The development and modernisation of developing and underdeveloped countries are related to urbanization. However, this involves the extremely rapid growth of many cities without the necessary extension of infrastructure and services, with a significant quantity of their population residing in informal settlements or slums devoid of any infrastructure or services

(Hardoy et al., 2001 as cited in Regmi, 2017). Haslam, et al. (2017) argued that urbanization and industrialization brought about significant changes in economic systems, which changed the social structure and raised income levels for vast numbers of formerly underprivileged individuals.

Modernization theorists have a prevalent habit of blaming traditional societies' backward mindsets and superstitious beliefs for the lack of economic growth, as well in public discourse (Haslam et al., 2017). The modernization strategy for economic growth is predicated on the idea that social transformation occurs in a straight line from antiquatedness to modernity. It specifically urges that technology, institutions, and attitudes be brought up to par with those found in the developed capitalist nations of the West (Beneria & Sen, 1981, p. 284). While agriculture continues to be the rural poor's main source of income, the continues rapid urbanization in the cities became problematic in the neighbouring rural areas. As stated in Haslam and colleagues (2017), cities are major users of water and energy resources, and they also generate a lot of garbage from both commercial and residential sources, as well as producers of greenhouse gas emissions. Rural areas provide food and other resources that cities rely on, but cities frequently encroach on and take over agricultural and open space. In addition to creating processes of land conversions and the displacement of residents of rural and small towns, such expansion has the potential to reduce the availability of food, water, and energy sources nearby. It can also bring needed infrastructure and economic opportunities to the urban periphery (Haslam et al., 2017).

3.2 Kate Raworth's Doughnut Economics

Having stated that rapid urbanization posed several challenges and opportunities in the population living in urban areas as well as in the nearby provinces, Kate Raworth's Doughnut Economics (2017) model puts an effort to get away from the contemporary capitalism's strong focus on Gross Domestic Product (GDP) and instead, emphasize the ecological and social elements which she highlights on her social planetary boundaries (*Figure 1*). Raworth argued that "*we have economies that need to grow, whether or not they make us thrive: what we need are economies that make us thrive, whether or not they grow*" (Raworth, 2017, p. 66). She explains further that this dramatic shift in perspective allows us to become agnostic about growth, which is creating an economy that supports human prosperity regardless of

whether GDP is increasing, decreasing, or remaining stable (Raworth, 2017, p. 238). Additionally, it investigates how societies that are currently dependent on development in terms of their economies, politics, and social structures may learn to exist with or without it. Her DE model (*Figure 1*) calls for achieving and creating economies that support human prosperity within a thriving web of life, allowing us to live in harmony inside the Doughnut's ecologically safe and socially just space for humanity. Otherwise, it will experience its pitfalls, underneath the Doughnut's social foundation, there are shortfalls in human welfare that individuals experience deficiencies without access to necessities like food, education, and housing, and among others. Beyond the ecological ceiling, pressure on the planet's life-supporting systems will increase due to factors including climate change, land conversion, chemical pollution, and so on (Raworth, 2017).

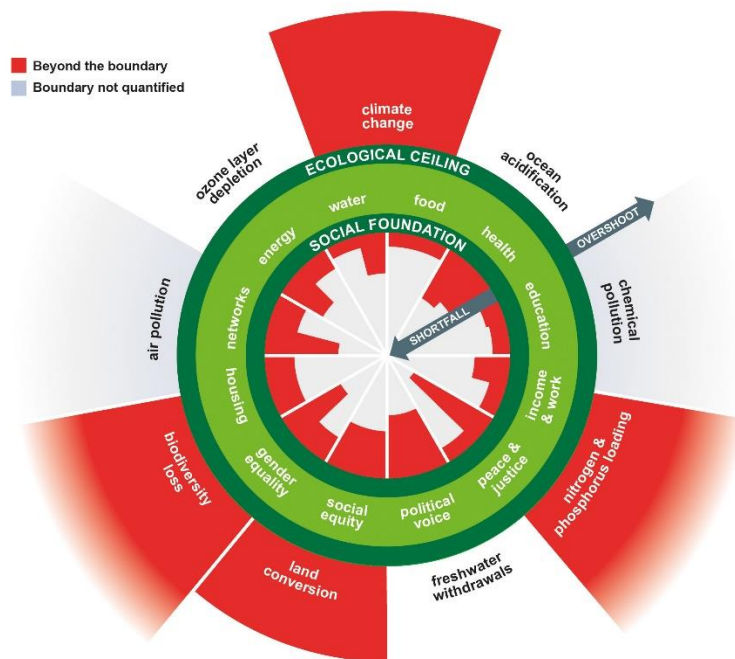


Figure 1. *The Doughnut of social and planetary boundaries (Raworth, 2017)*

In Raworth's *Embedded Economy* (*Figure 2*) she discussed to develop economies that are regenerative by design, restoring and renewing the local to global cycles of life that are essential to human well-being. Beginning with the understanding that every economy, from local to global, is embedded in society and the natural world. Her Embedded Economy also entails acknowledging that the household, commons, market, and state may all be efficient

means of providing for our diverse needs and goals, and that they typically function best when they cooperate (Raworth, 2017).

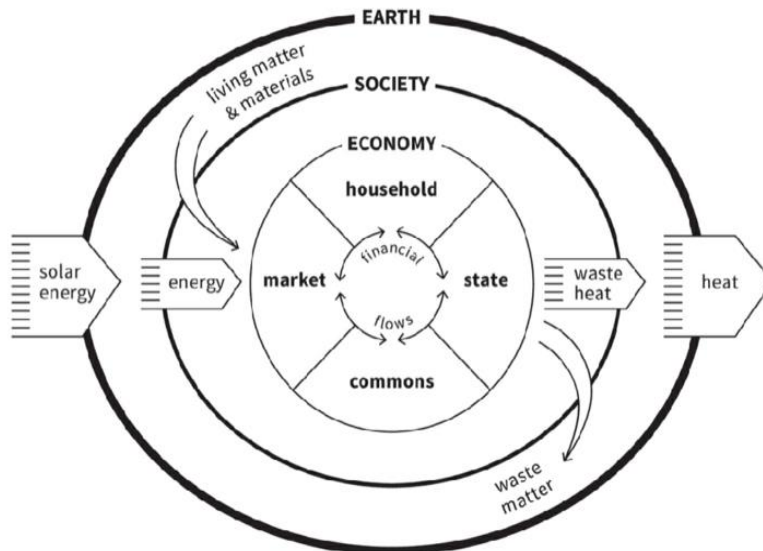


Figure 2. *Kate Raworth's Embedded Economy (Raworth, 2017)*

Many cities throughout the world are putting the ideas of doughnut thinking into practice, with Amsterdam, Sydney, Melbourne, Berlin, and Brussels being the pioneering cities to explore the Doughnut Economic perspectives (DEAL, 2021). She does not, however, fully ignore the urban development in her book because she explains how the urban areas and land conversions are crucial to a sustainable future and can worsen our ecological crisis and put pressures to the people living therein.

In connection to her Embedded Economy (Raworth, 2017), it requires the state's governance frameworks that can lessen human pressure on the planetary boundaries. In addition to emphasizing market and state solutions, the Embedded Economy will also use the power of households and the commons through promoting innovative ideas. This alternative economic paradigm firmly believes that households and the commons are creative and open to many forms of cooperation rather than viewing them as being purely motivated by self-interest. Her alternative economic model does not focus solely on the significance of market and the state.

Instead, it also emphasizes the importance of households and the commons as fundamental institutions because the market and state are unable to foster the same types of carrying capacity, reciprocity, trust, and innovation. Moreover, as households and commons who benefit from interacting and are dependent with one another with this shared living space (Raworth, 2017).

The living world suffers when the market is unrestrained because it puts too much strain on the Earth's finite sources. Raworth (2017) argues that the state should take additional steps to promote changes that could result in a sustainable transition. She further believes that urban landscapes and factories can both be designed to be regenerative and distributive. She cited many great examples such as seeing household on becoming an energy provider, and cheaper housing that is connected to public transport in just doorsteps (Raworth, 2017). Other example that Raworth been suggesting that both factories and industries and urban landscapes can be regenerative by design is promoting urban agriculture (Raworth, 2017). It is argued that urban agriculture may have a positive impact on the food security of a household since it gives that household immediate access to the food it produces and direct income. Households that engage in urban agriculture may have access to a broader variety of particularly nutrient-rich foods, such as vegetables and products of animal origin, at a lower relative cost (Zezza & Tasciotti, 2010). With the increasing urbanization in many parts of the world, one can argue that incorporating urban agriculture as a tool to solve concerns of food security, environmental sustainability, community development, and public health is something that many communities can engage for (Matthew, 2017). Thus, urban agriculture can contribute to sustainable urbanization as it shorten the gap between production and consumption (Matthew, 2017).

4. The case of urbanization in the Metro Manila, Philippines and in the nearby countryside

The Philippines is composed of 7,107 islands, with the three main groups being Luzon, Visayas, and Mindanao. There are 17 regions that make up these island groups. The National Capital Region (NCR), also known as Metro Manila has been experiencing rapid urbanization (Malaque III & Yokohari, 2007). Region IV-A, also known as CaLaBaRZon (Mc & Colson, 2008), which comprises five provinces (CAvite, LAguna, BAatangas, Rizal, and QueZON) in southwest Luzon, just south and east of Metro Manila (*Figure 3*), is one of

the Philippine's regions that is experiencing fast urbanization (Mojares, 2013). In *Table 1* shows that Region IV-A CaLaBaRZon has the biggest population exceeding the National Capital Region (NCR) based on the 2020 Census of Population and Housing, and 2015 Census of Population (*Urban Population of the Philippines (2020 Census of Population and Housing)*, 2022). According to Mojares (2013), CaLaBaRZon is the second most densely inhabited region in the nation and in 2000, with 26% of migrants, CaLaBaRZon became the most popular place for internal migration, compared to Metro Manila's 19%. This is because of Manila's close vicinity and the numerous commercial and industrial opportunities that exist there. Moreover, industrialists and real estate developers are increasingly interested in the CaLaBaRZon region as a potential alternative. Due to its close proximity to Metro Manila, marketplaces, resources, commercial services, and government buildings are all easily accessible (Magno-Ballesteros, 2000).



Figure 3. *CaLaBaRZon Region*

Source: Population Reference Bureau

Region	Total Population		Urban Population		Level of Urbanization (Percent)	
	2020 ^a	2015 ^b	2020 ^a	2015 ^b	2020	2015
	Philippines	109,033,245	100,979,303	58,930,729	51,728,697	54.0
NCR	13,484,462	12,877,253	13,484,462	12,877,253	100.0	100.0
CAR	1,797,660	1,722,006	598,688	524,672	33.3	30.5
I – Ilocos	5,301,139	5,026,128	1,351,205	1,029,562	25.5	20.5
II – Cagayan Valley	3,685,744	3,451,410	717,788	663,695	19.5	19.2
III – Central Luzon	12,422,172	11,218,177	8,230,254	6,914,703	66.3	61.6
IV-A – CALABARZON	16,195,042	14,414,774	11,415,742	9,564,515	70.5	66.4
MIMAROPA	3,228,558	2,963,360	1,138,021	905,666	35.2	30.6
V – Bicol	6,082,165	5,796,989	1,447,370	1,344,903	23.8	23.2
VI – Western Visayas	7,954,723	7,536,383	3,353,205	2,868,795	42.2	38.1
VII – Central Visayas	8,081,988	7,396,898	4,196,639	3,656,628	51.9	49.4
VIII – Eastern Visayas	4,547,150	4,440,150	666,473	529,902	14.7	11.9
IX – Zamboanga Peninsula	3,875,576	3,629,783	1,489,443	1,373,274	38.4	37.8
X – Northern Mindanao	5,022,768	4,689,302	2,528,239	2,272,001	50.3	48.5
XI – Davao	5,243,536	4,893,318	3,504,533	3,108,872	66.8	63.5
XII – SOCCSKSARGEN	4,360,974	4,053,514	2,418,843	2,031,361	55.5	50.1
XIII – Caraga	2,804,788	2,596,709	1,027,223	869,195	36.6	33.5
BARMM	4,944,800	4,273,149	1,362,601	1,193,700	27.6	27.9

Notes:

^a The 2020 total population and urban population exclude 2,098 Filipinos in Philippine embassies, consulates, and missions abroad.

^b The 2015 total population and urban population exclude 2,134 Filipinos in Philippine embassies, consulates, and missions abroad.

Sources: Philippine Statistics Authority, 2020 Census of Population and Housing and 2015 Census of Population

Table 1. Total Population, Urban Population, and Level of Urbanization by Region, 2020 and 2015

The Philippines' economy performed well between 1990 and 1997, which led to a significant increase in demand for real estate from both domestic and international markets. The urbanization process that has dictated Manila's expansion since its emergence as a primate city under colonial authority has also led to physical changes in the nearby countryside (Malaque III & Yokohari, 2007). The share of the population living in the capital city, Manila reached for about 13.48 million in 2018 (DESA, 2019). With 47.98 percent of the population residing in cities, the population is expected to rise quickly, reaching 61.78 percent in 2050 (Ritchie & Roser, 2018).

Metro Manila as one of the rapidly growing cities in Southeast Asia have experienced land use conversion mainly for industrial and residential purposes. Due to the rapid urbanization, it has opened for potential job and educational opportunities and improves the living conditions for the local residents. However, the congested population and the high cost of living have pushed people to live outside of Metro Manila (Regmi, 2017). One of the neighbouring provinces is the Province of Cavite. The Province of Cavite have been experiencing the rapid growth rate of people moving in to settle and ranked as first area in the Philippines in terms of the rate of applications for land use conversion between 1988 and 2000 (Malaque III & Yokohari, 2007). Many people living in Metro Manila decided to invest

in buying house property or getting a loan to get a house in subdivision due to high cost of house renting and the inadequacy of proper and safe space for living within Metro Manila. Moreover, due to its close proximity to Metro Manila, people living in Cavite finds it accessible to travel for employment while maintaining their job in the Metro Manila. Thus, some people living in the centres of cities and municipalities of the province of Cavite became the daily operational trajectory of Metro Manila as many of them work in Metro Manila. However, the neighbouring areas of Metro Manila have seen an increase in development due to the rising land prices in the region as well as the accompanying environmental issues brought on by urbanization (Magno-Ballesteros, 2000).

5. Location of the Study

Located in the CaLaBaRZon region of the central island of Luzon, Cavite is a province in the Philippines. Imus City serves as its capital. It is one of the most industrialized and rapidly developing provinces in the Philippines, situated southwest of Manila on the southern shores of Manila Bay. The province has a total land area of 1,426.06 square kilometres consists of 7 cities and 16 municipalities (*Figure 4*).

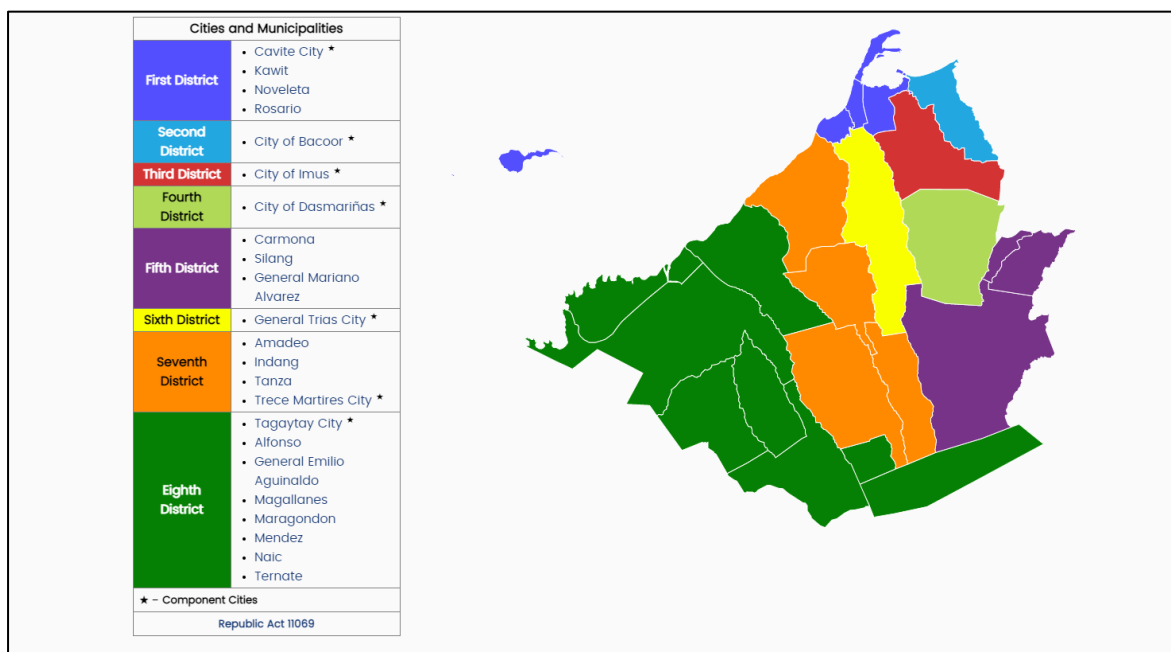


Figure 4. *The Cities and Municipalities of the Province of Cavite*

Source: Official website of the Province of Cavite. www.cavite.gov.ph

6. Discussion and Analysis

This section will give the analysis, which is structured in accordance with my main research question and sub-questions. The first part will discuss the opportunities and challenges brought by urbanization that local residents of the province are facing. The second will give an analysis on how the urbanization alters the province's agricultural landscape. The last part will provide an analysis of local government's initiatives/strategies in addressing the pressures brought by urbanization, and how it develops to support urban sustainability.

6.1 Urbanization: An opportunity or a threat?

The population in the Province of Cavite has grown as a result of the influx of immigrants as it is known for commercial and residential centre. The province's economic growth is ascribed to its close proximity to Metro Manila, which has led to a rise in investment, employment, and the construction of service industries. Thus, the demand for jobs, housing, social welfare, infrastructure, transportation, recreation, and other services will expand along with the anticipated expansion in the population of the Province of Cavite (Provincial Development Council, 2022). Thus, it reflects that the development process in the province is clearly hampered by rapid urbanization.

In 2020, five of the 81 provinces had populations that were greater than 1,000 people per square kilometre (*Table 2*). With 2,847 people per square kilometre, Cavite was the province with the highest population density (*Highlights of the Population Density of the Philippines 2020 Census of Population and Housing (2020 CPH)*, 2021). As previously discussed, the proliferation of housing subdivisions is an element linked to the rise in population. Because of Cavite's proximity to Metro Manila, many people who work in the city opt to settle there with their families. Hence, the population rise is also influenced by natural growth. Another factor attributed to the increase of the population in the province is the abundance of employment prospects. Investors set up their business in a variety of industrial estates that attracted people to move in the area.

Rank	Province	Total Population	Land Area (Square Kilometer)	Population Density (Persons Per Square Kilometer of land)
1	Cavite	4,344,829	1,526.28	2,847
2	Rizal	3,330,143	1,182.65	2,816
3	Laguna	3,382,193	1,928.23	1,754
4	Bulacan	3,708,890	2,783.69	1,332
5	Pampanga *	2,437,709	2,001.22	1,218
6	Batangas	2,908,494	3,115.05	934
7	Cebu **	3,325,385	4,943.72	673
8	Bataan	853,373	1,372.98	622
9	Pangasinan	3,163,190	5,450.59	580
10	La Union	822,352	1,499.28	548

* Excluding the City of Angeles

** Excluding the City of Cebu, the City of Lapu-lapu, and the City of Mandaue

Sources: Philippine Statistics Authority, 2020 Census of Population and Housing
Land Management Bureau, 2013 Masterlist of Land Areas of Cities and Municipalities

Table 2. Ten Most Densely Populated Provinces: 2020

6.1.1 Urbanization and employment

Urban areas can attract people from rural areas since it offers more possibilities of employment opportunities and much higher salaries. According to the data gathered by the Provincial Planning and Development Office of Cavite (*The Official Website of the Provincial Government of Cavite*, 2022), there are 805 industrial facilities were operational throughout 2008. The 431 majority of these industrial establishments have been located in District II, which is followed by District I with 282 and District III with 92 industrial spaces. These industrial establishments are most prevalent in Rosario, a highly urbanized municipality, where there are 274 of them, followed by Carmona, where there are 188, and Dasmariñas, where there are 128 (*The Official Website of the Provincial Government of Cavite*, 2022). Remedio (1996) argues that the newly registered businesses in the Province of Cavite are completely exempt from income taxes for six years for pioneer businesses and four years for non-pioneer businesses following the start of commercial operations, Cavite is believed to be a desirable location for foreign direct investment (Remedio, 1996). Thus, the province is becoming more industrialized where foreign businesses are allowed to establish

operations with tax exemptions. The employment opportunities become available to the local people as a result of industrialization.

Due to industrialization, the rapid urbanization in the province take place as it provides additional manpower sources. This has led to internal migration as workers and their families look for housing close to the workplace. Based on the province's PDPFP (Provincial Development Council, 2022), due to its proximity to Metro Manila, the province economy, business establishments, and industries have grown throughout time. The province evolved as the focal point of Metro Manila's commercial and industrial growth. The service sectors in the province makes up the bulk of the province's economy such as the growing Information Technology (IT) and Business Process Outsourcing (BPO) industries, economic zones, eco-tourism zones, and commercial and industrial businesses (Provincial Development Council, 2022). The abundance of human resources in the province is advantageous in supporting the labour demands of the aforementioned service industries. In this regard, there is a positive relation between the Province of Cavite's PDPFP in the contribution of local employment growth (Provincial Development Council, 2022, p. 224) and Kate Raworth's social foundation of human rights in terms of having an income and decent work in the province. However, although there are industries in the province, employment will rise, which will fuel future population expansion. The province's PDPFP indicated that to handle the flow of migration in the province, local provision for future growth, such as expanded areas for residential and commercial purposes, may be required (Provincial Development Council, 2022).

6.1.2 Urbanization and housing

Making cities and human settlements inclusive, safe, resilient and sustainable is the eleventh twelfth sustainable development goal in the 2030 Agenda for Sustainable Development, and can be interpreted to sufficient availability of affordable and decent housing (UN General Assembly, 2015, p. 21). The Province of Cavite is currently dealing with a difficult situation in providing its constituents an affordable and decent housing units with access to essential utilities and services. At present, there is housing scarcity in the province, thus an expansion is required to keep up with demand (Provincial Development Council, 2022). Underneath the Doughnut's social structure, lie shortfalls in human well-being (Raworth, 2017). The social foundation is already under pressure in the province of Cavite in terms in access to affordable

and sustainable housing. The lack of a centralized organization to identify, oversee, and carry out local housing initiatives is an issue in the province (Provincial Development Council, 2022). While the main constraint with the province's housing services is the province's rapid population increase and the influx of new immigrants.

The province is regarded as the most populous in the country, which resulted shortage of housing in the area. Furthermore, the province's population is expanding quickly, which contributes to an even greater shortage of decent, affordable housing. Several province-wide communities have an inadequate land available to meet projected housing needs. It has been an issue that the nearby local government unit (LGU) relocate informal settlers into the province, increasing the demand for housing developments. In addition, existing in the province are unregistered settlers who have little access to employment prospects in established housing areas (Provincial Development Council, 2022). The provincial government supports the creation of a variety of housing projects that would cater to various markets. Resettlement Housing Projects were provided for the informal settlers from Metro Manila and displaced families from various development projects. In addition, governments employees from different LGUs benefited from these projects such as the police employees, military personnel, public school teachers, and informal settlers from different reclamation areas in the province (Provincial Development Council, 2022). Furthermore, to reduce the number of displaced families and informal settlers, the province implemented the Provincial Mass Housing Projects.

6.1.3 Urbanization and the environment

Society can benefit from urbanization such as potential opportunities for employment and better access to basic services such as schools and health care facilities. However, it is argued that urban activities, both inside and outside of their borders, contribute to environmental degradation. This can be reflect in the use of energy and materials in cities such as in transportation and infrastructures, the changing food consumption patterns, and the production and management of waste are the main causes of these environmental impacts (UNEP & UNHSP, 2021). Additionally, there are no equivalent investments in social and physical infrastructure such as roads, security, water supply, sewerage systems, and other public utilities to support the residential land developments. These in turn creates

environmental issues such water pollution, soil erosion, waste generation, and loss of vegetation cover due to the absence of investment in these infrastructure and services (Thuo, 2013, p. 78).

Due to rapid growth rate of population and the industrial expansions, the Province of Cavite is facing environmental challenges. It has brought the environmental impacts of land use conversion where the subdivision and housing development exacerbated flood damage, solid waste management that also caused river pollution, the built of shopping malls and daily rate of public transportations from Metro Manila to Cavite and vice versa have caused to congested traffic conditions and air & noise pollutions (Mojares, 2013). In addition, the conservation and the natural resource management will further reflect that the rapid urbanization will become more important concerns in the province and will see as a problem and threat to environment.

6.1.3.1 Traffic congestion

Congested housing could become a source of an array of other issues, such as insufficient parking space for cars, e-bikes, motorcycles, and tricycles. It is quite common that the narrow roads became more narrowed as some owners just park outside of their house or outside of the commercial areas. Which resulted to traffic in the area and chaos for the people walking in the road. It is argue that the narrow roads, which have not been widened to accommodate the increasing traffic, are also to blame for this (Thuo, 2013). Congestions in the traffic are evident in the province. This is largely because the congested highways have not been widened to accommodate more traffic. Normally, there are traffic congestion in the morning and evening since the wave of people going to and out from work and schools are the usual commuters and travellers in the province. However, as a result of population growth in the province, the road networks were also not planned to handle the current levels of the traffic from the private and public vehicles. This situation was significantly influenced by the growth of infrastructure projects like roads and bridges, the abundance of employment prospects, and its proximity to Manila.

6.1.3.2 Solid waste

Based on their PDPFP (Provincial Development Council, 2022), the law on proper ecological disposal of solid waste, which causes the least amount of harm to the environment, is outlined in Republic Act 9003. The provincial administration has adopted Executive Order No. 29 in support of this, mandating that all municipalities and localities in the province establish waste reduction, recovery plans, and change their open dumpsites into controlled ones. It is complemented by the Provincial Ordinance No. 007-2012, which controls the use of plastics and encourages the adoption of environmentally friendly packaging and activities (Provincial Development Council, 2022).

However, they have stated on the PDPFP that the absence of a solid waste management plan, which would have provided a framework for its implementation and ensure community compliance with current environmental legislation and LGU code, poses the biggest hurdle to the province's solid waste management efforts. The province's lack of solid waste disposal facilities and centralized sanitary landfill are further problems. The province's failure to have a single, centralized sanitary landfill also prevented its cities and municipalities from meeting their goals for water diversion (Provincial Development Council, 2022).

Raworth (2017) argues that the fundamental principle of that industrial system is the take, make, use, lose manufacturing supply chain which is to collect Earth's minerals, metals, biomass, and fossil fuels; manufacture those into items; sell those to consumers who, more often than not, would toss those products away. With rapid urbanization in the province, the residential houses and commercial spaces produce a variety of solid wastes. Although the LGU of the province cater the collection of solid waste, the local people in general are not practicing the proper segregation of the solid waste. In addition, some of the solid garbage is generated and dumped outside near the river with little to no safeguards against contaminating the soil and water in the area. The wastes of the economy such as throwaway plastics, are disposed of on Earth.

Since, nearly no matter leaves or enters Earth, making it a closed system and the energy from the sun may pass through Earth, but materials may only cycle inside it (Raworth, 2017). It would be interesting to dig into the possibility of Doughnut Thinking which Raworth offers several environmentally friendly circular initiatives and acknowledges that towns must

implement her new guidelines in order to deal with this problem. She stated how the economy may be reformed to use matter and energy in a way that complements rather than competes with the cycles of life that those boundaries are meant to preserve. Instead of being degenerative that focuses on linear economy of the waste: *take, make, use, dispose* to being regenerative by design which focuses on circular economy of the waste: *repair, reuse, refurbish* (Raworth, 2017, p. 220).

6.1.3.3 Risk of hazards

The Province of Cavite has been facing challenges because of climate change and because the Philippines is one of the countries where typhoon is inevitable. Facing towards sustainability is a challenge, for the reason that most of the government funds are allotted during calamities. It is argued that the absence of investment in the necessary infrastructure and services is causing these residential developments to generate environmental issues such water contamination, soil erosion, waste generation, and loss of plant cover. In addition, when a typhoon strikes, flooding in the area is worse and unavoidable due to the unchecked development of infrastructure and informal settlements (Rubio et al.).

Malague III and Yokohari (2007) suggest on their paper that green open spaces be preserved by using an ecological planning strategy that incorporates a mix of urban and agricultural land uses. They proposed that policies aiming at maintaining green spaces in the countryside and establishing green spaces in the city centre should be enforced because of its potential ecological role in absorbing pressures brought on by urbanization.

6.2 Urbanization and the Changing Agricultural Landscapes

The province of Cavite already has its overshoot in terms of land conversion based on Raworth's social and planetary boundaries (Figure 1). Due to its proximity to the nation's capital, the province is a significant food supplier to Metro Manila. However, the rapid peri-urbanization occurring in Cavite as a result of the construction of building of residential and industrial complexes, it poses a threat to food security. This was evident when the amount of land used for agriculture has decreased from 73% in 1990 to 54% in 2001 (Masbang et al.,

2004). The increasing number of land transformation from agricultural and vacant lands to industrial and technological parks, commercial spaces, and residential subdivisions revealed the urban expansion in the province (Berja & Colson, 2008 as cited in Mojares, 2013). It was supported by the province's PDPFP (Provincial Development Council, 2022), which stated that the province was among the regions that profited from the expansion of the NCR. When people and even industry pour over from Manila, Cavite acts as a catchment area.

To meet the population growth and industrial expansion, prime agricultural areas were transformed for public and commercial usage. Urbanization in the province is associated with the shifts in land use from mostly agricultural to urban operation which in turn the focus of economic activity is on favour of the industrial services and commercial spaces. The 1990s saw the growth of big industrial estates and brand-new residential subdivisions, which sped up the conversion process. In the province, more than 150,000 industrial jobs were added during the course of the ten-year period. In 2002, 62,893 people were employed by registered industrial establishments outside of export processing zones, whereas 96,894 people were employed by businesses inside economic zones (Kelly, 2003). An example is the Cavite Economic Zone (CEZ), one of the first economic zones in the nation, was formerly a rice field near Rosario and served as a showcase for the province's development in the early 1990s (Provincial Development Council, 2022).

Despite the fact that there are several rules and regulations protecting farms, their implementation, particularly at the district level, is quite lax. The strategy undertaken of the province to focus on rural industrialization have calls for the establishment of medium-sized to large resource-based enterprises in the highland areas (Provincial Development Council, 2022). It is anticipated that existing agricultural lands would continue to shrink to make space for the construction of new industrial sites. The province's ongoing efforts to industrialize and open its doors to commercial and business enterprises would always be impeded by the lack of a sizable tract of fertile land that might be used for private purposes. Philip Kelly (2003) argues that due to land conversion, a number of times, social and environmental developments at the village level have sparked explicit resistance against land conversion. The politics of resistance to land conversion are driven by larger concerns with food security and development priorities on a national scale. The land conversions from agricultural land to industrial or residential land has made the landscape of the urban periphery in a constant change (Kelly, 2003).

6.3 Policies and development initiatives

In this section, I will analyse the province's latest framework, the *Provincial Development and Physical Framework Plan (PDPFP) for the years 2021 to 2030*. Due to the continuous efforts of industrialization and rapid urbanization in the Province of Cavite, that will prevent it from succumbing to its existing situation and move forward in continuing along the path of economic growth (Provincial Development Council, 2022). The local government of the province has developed an “alternatives” (Provincial Development Council, 2022, p. 365) which include claims about the sectoral policies' intended targets for influencing development patterns and the ways in which these diverse policies will be integrated to achieve overall spatial strategies (Provincial Development Council, 2022).

Based on the Department Circular No. 2022 – 003 (Secretary, 2022), approving the province's PDPFP, the rural-urban integration is the province's desired development goal, and it will be achieved by spreading growth across three areas: (a) traditional settlements and coastal regions as the new global hubs for trade, commerce, and industry; (b) the area of the first wave of industrial estates as the preferred location for new foreign and domestic investments; and (c) Metro Tagaytay as the tourism and food hub. Moreover, with the province PDPFP, it will establish the province's development course with the ultimate goals of enhancing the resilience of its citizens, promoting a thriving and inclusive economy, and preserving a clean, healthy, and sustainable environment. The same will direct the creation of the various Comprehensive Land Use Plans by the province's component cities and municipalities (Secretary, 2022).

6.3.1 Multi-centered Development

In order to create a desirable area that is open to interaction with many societal sectors, this approach asks for the establishment of centres that will spark active development activities and the introduction of industrial, commercial, and other purposes. This includes the focus but not limited to agricultural development and the enhancement of the natural features in

response to the production of prime agricultural lands (Provincial Development Council, 2022, p. 365).

Urbanization has been driven by economic growth, but slums and squatter communities are indications that there is a significant housing problem in the province. Minimizing the number of people living in slums and promoting fair access to housing and services in the region reflect to Raworth's DE (Raworth, 2017). Similar to the province of Cavite's initiative to establish a local housing council, there is a potential to better monitor housing developments and establishing connections with relevant local and national government organizations for the development of housing projects in the province (Provincial Development Council, 2022). It could be further argued that for the local people in the province to thrive, bringing the important actors together at the table is essential. This could be done through cooperation of the LGU to the province's numerous citizens, communities, and organizations. Through Raworth's concept of DE, they can ask question and discuss what does thriving imply to the local residents from a social perspective then contrasts the community's desire with a quick look at the place's current situation (Fanning et al., 2022).

6.3.2 Rural Industrialization

Under this strategy, resource-based medium to large industries will be established in the highland areas. Likewise, services directed to the rural population will be developed. It is expected that existing agricultural areas will further decrease to give way to the establishment of new industrial sites. The goal of the strategy is to increase agricultural output by intensifying crop, and livestock and poultry production in the sparsely populated agricultural areas in order to support industries and take advantage of market opportunities. This plan will also prioritize non-farm jobs in rural areas which will in turn anticipates the employment growth (Provincial Development Council, 2022, pp. 365-366).

To ensure that there is an adequate supply of food, particularly vegetables in the country, the Department of Agriculture IV-CALABARZON (DA-4A) continues to administer the Urban and Peri-Urban Agriculture Program in the region. Imus, Cavite, was one of the cities where the intervention took place. They were provided with various seeds, lawnmowers, drums, plastic mulch, organic fertilizer, grasscutters, and multi-cultivators for the established

communal garden (Llagas, 2022). One initiative that the City Agriculture of Office of Imus, Cavite and local residents have undertaken is that its agriculture sector continues to grow despite the Covid-19 pandemic (Francisco, 2021). Ruel Francisco argues that following the conversion of numerous rice fields into industrial zones, commercial complexes, and subdivisions as a result of growth and development, the city still has around 567 hectares of rice fields and roughly 80 to 100 hectares of vegetable farms (Francisco, 2021). It was evident on the satellite photos below of the two areas of rice fields and vegetable farms: First, is in Carsadang Bado, Imus, Cavite (*Figure 5*) and second, is in Pasong Buaya, Imus, Cavite (*Figure 6*).

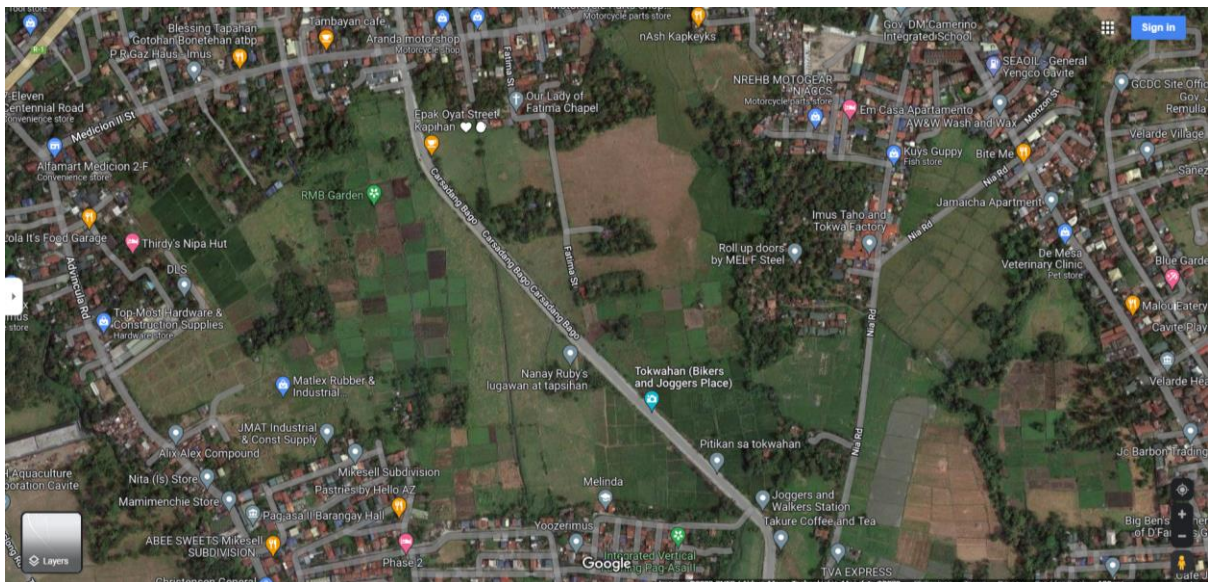


Figure 5. *Satellite photo of Carsadang Bado, Imus, Cavite*

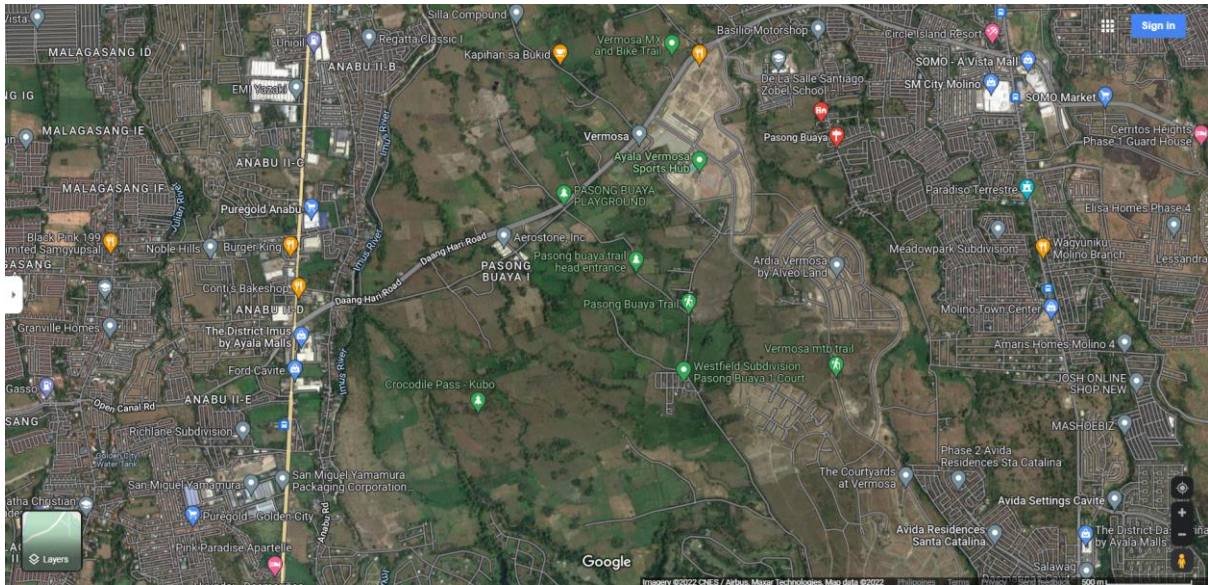


Figure 6. *Satellite photo of Pasing Buaya, Imus, Cavite*

The possibilities which Kate Raworth has been suggesting that from degenerative to regenerative by design, for example in agriculture, from land degradation to land restoration (Raworth, 2017) can contribute to promoting ecological sustainability and food security in the province and to its neighbourhood areas. The execution of policies to conserve agricultural land with the involvement of different actors, community-wide cooperation, public policy initiatives, methods, models, guidelines, and regenerates local resources to satisfy the changing demands of local residents while serving a variety of aims and functions can provide guidance in the province on how to live generously and resiliently within their biome (Fanning et al., 2022).

6.3.3 Urban-Rural Integrated Development

The "seed to market" approach is recommended by the strategy, which combines marketing, processing, and agricultural production. The development of infrastructure facilities, particularly farm-to-market highways, communication networks, and power, is essential to this strategy. By supporting investments in post-harvest and other support facilities in production areas, this economic connection will be furthered. Agritourism and ecotourism also incorporated with rural development to capitalize on the natural and indigenous qualities of the countryside while utilizing rural living and the scenery (Provincial Development Council, 2022, p. 366). This approach conforms with DE thinking on which Raworth cited

Janine Beynus on the latter's vision to create a 'generous cities'. It is argued that urban landscapes can be regenerative by design such as adopting a new city standard, which challenged and inspired its architects and planners to create buildings and landscapes that are 'as generous as the wildland next door' (Raworth, 2017, p. 221). When urban areas encroach into rural areas, changes are triggered in both production and demand for food and other natural resources. The functioning of ecosystems and biodiversity are significantly impacted by the rural-urban gradient in the urban zone. A range of advantages for humanity can also come from emerging rural-urban land usage (Yokohari et al., 2017).

Moreover, on this Urban-Rural Integrated Development strategy aims that both on and off farm employment to rise in rural areas. Home-based businesses and cooperatives will greatly expand employment. As rural development proceeds through increased agricultural production combining with tourism development and ecological soundness, there will be a noticeable improvement in the standard of living of the rural people, resulting in a decrease in migration to metropolitan regions. With this strategy, the provincial government also support the development of businesses that would strengthen connections with agriculture. Small and medium-sized businesses continue to be growth-oriented forces (Provincial Development Council, 2022, p. 366)

7. Conclusion

Due to the close proximity of the Province of Cavite to Metro Manila and the former's increasing in industrial and economic hubs, there are positive impacts of employment opportunities. There is an indicative internal migration in the province from different regions because of the increasing share in the economic zones, manufacturing establishments, and the growing BPO and IT industries. However, the rural-urban fringe's growing population has led to an increase in vehicular traffic which the road networks were not built to handle it. Environmental challenges such as air and water pollution, solid waste management and conservation of natural resources are inevitably become major concerns due to the inflow of people and the rapid expansion of industry. Inadequate medical services and facilities are the other issue the province is currently facing. Due to influx of internal migration and the continuous demand of land for industrial purposes, urbanization has been put pressure in agricultural land. The process of converting land from agricultural to urban purposes has been

the subject of heated public discussion. It raises sensitive subjects including the importance of industrial development over agricultural development, the rights of tenant farmers, and the rights of agricultural workers (Kelly, 1998). Furthermore, the politics of opposition to land conversion are driven by larger concerns with food security and development goals on a national scale (Kelly, 2003).

It was further argued that one way to lessen the harmful effects of urbanization is through PUA (Pribadi & Pauleit, 2015). PUA demonstrates a range of responses to urbanization and the state of the economy that are significant for both the peri-urban and the whole urban system. It is argued that PUA increases food security during times of crisis while also providing the farmers and peri-urban residents the employment opportunities and income (Pribadi & Pauleit, 2015). Thus, to ensure sustainable land use, it is important to consider in developing a policy to support PUA. However, the province's local governments continue to exclusively focus on promoting the economy despite substantial social and environmental challenges. Given that PUA is not regarded as a significant economic activity, its ability to reduce urban poverty will be called into question. Will they be able to install the question of capitalism? And in the interest of promoting PUA, will this actually happen? It was argued by DE thinking (Raworth, 2017) that giving up GDP growth as an economic objective may not be difficult but getting over our dependence on it will be far more challenging.

The economy of the present and the past has an effect on the local people's knowledge, behaviours, culture, and attitudes, which in turn affects their decision. It is important to involve the community in future decision-making processes such as increasing awareness of people in general will be highly significant in preserving agricultural lands. On the path to achieving urban sustainability, they should be given the opportunity to decide and take part.

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