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Towards National Food Security: The Necessity of Public Participation in Agricultural Land Conversion

Soediro Soediro[1]
Mahdi Muhammad[1*]
Kem Nori Alfath[2]

[1] Universitas Muhammadiyah Purwokerto, Indonesia
[2]University of Leeds, United Kingdom

*✉
mahdi.muhammad712@gmail.com

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Abstract:
National Food Security in Indonesia faces threats from agricultural land conversion, especially with a projected 324.05 million population by 2045 and only 5.2 million ha of paddy fields left. Policy and community involvement are essential to curb land conversion and sustain food production. While regulations exist, their implementation remains suboptimal due to community support for land conversion to housing. This study delves into public participation's role in agricultural land conversion for food security. This research is normative judicial review research. It employs two approaches: a statutory approach to understand regulations and a case approach to study their practical application. Data sources encompass laws, regulations, literature, and Indonesian agriculture and food security documents. Factors driving land conversion include economic challenges like low incentives and high production costs, societal perceptions deeming farming less prestigious, a rising population, increased land values near cities, and irrigation water shortages. The strategy advocates for active stakeholder involvement to combat land conversion, emphasizing community participation in planning, execution, monitoring, and evaluation. This approach, backed by legal analysis, aims to thwart land conversion and preserve agricultural lands effectively.

Keywords:
Agriculture; Land Conversion; National Food Security.

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✉ jurnal.dinamikahukum@unsoed.ac.id 🌍 https://jos.unsoed.ac.id/index.php/jdh/index

Introduction

National Food Security is a crucial issue when it comes to national development because, based on data from ESD and Indonesian Population Projections 2020-2050, Indonesia's population will reach 285.55 million people in 2025. Furthermore,

in 2045, it is predicted to reach 324.05 million people.[1] Food security is a condition of sufficient food availability for everyone at all times, and every individual has physical and economic access to it.[2] According to The Indonesia's Food Law (2012), food security is a state where individuals have consistent access to sufficient, safe, diverse, nutritious, equitable, and affordable food that aligns with religious, cultural, and personal beliefs. This access is essential for leading healthy, active, and productive lives in a sustainable manner.

To assess the role of food security in sustainable national economic development, it is imperative to consider food security as a comprehensive system that safeguards against various threats to the food sector. One such threat is the conversion of agricultural land for alternative uses.[3] According to the United States Agency for International Development (USAID), food security is when all people have physical and economic access to obtain their consumption needs for a healthy and productive life. Meanwhile, according to the Food and Agriculture Organization (FAO), food security is a situation where households have both physical and economic access to food for all family members, where households are not at risk of losing both access.[4]

Agricultural land conversion is difficult to control despite the existence of The Protection of Sustainable Food Agricultural Land Law (2009). Government efforts continue with the issuance of the Presidential Regulation on Control of Paddy Field Conversion (2019). The objectives of the Presidential Regulation include accelerating the provision of maps of protected paddy fields, controlling land conversion, empowering farmers not to convert land, and providing data on paddy fields as material for determining sustainable food agricultural land.[5]

A study on the socio-economic impacts of agricultural land conversion conducted by Zhang et al., (2023) revealed that, among the temporal impacts, the most significant effects were related to demographic changes and crime, representing social impacts, as well as jeopardizing agricultural productivity,

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[1] Widya Finola Ifani Putri, "Siap-Siap! Populasi RI Disalip Nigeria & Pakistan Tahun 2045," CNBC Indonesia, 2023.

[2] (Taufiqurokhman & Andriansyah 2022)

[3] Dmitry Alekseevich Loginov, "Food Security as a Factor of Sustainable National Economic Development," *E3S Web of Conferences* 537 (2024): 0–4, https://doi.org/10.1051/e3sconf/202453704002.

[4] Yusman Taufik & Sumartini Asep Dedy Sutrisno, Wisnu Cahyadi, *Ketahanan Pangan* (Bandung: Manggu Makmur Tanjung Lestari, 2022).

[5] Anny Mulyani et al., "Analisis Kapasitas Produksi Lahan Sawah Untuk Ketahanan Pangan Nasional Menjelang Tahun 2045," *Jurnal Sumberdaya Lahan* 16, no. 1 (2022): 33–50, https://doi.org/http://dx.doi.org/10.21082/jsdl.v16n1.2022.33-50.

representing economic impacts.[6] The threat of conversion of agricultural land to non-agricultural land is a negative signal for the agricultural sector. The land conversion will decrease production capacity while the population continues to increase every year. [7] The conversion of land poses a substantial threat to food security. Regions that were once self-sufficient in rice production now rely on imports. This threat not only diminishes rice production but also negatively impacts economic, social, and political stability and overall population development.[8] Considering that the population is increasing yearly, the need for food is also increasing, but agricultural land is currently decreasing, [9] according to Purwaningsih's opinion, which states that food provision through increasing domestic production capacity is faced with increasingly limited agricultural land, which in the long term results in a decrease in production capacity. One of the causes of this situation is the conversion of agricultural land to non-agricultural land.[10]

Land conversion will be the biggest threat to realizing sustainable food security until 2045 if it cannot be controlled. The production capacity of paddy fields will continue to decline if the conversion of paddy fields cannot be suppressed and there is no effort to protect productive paddy fields, especially in Java and other big cities with extensive paddy fields. If land conversion remains at around 90,000 ha/year, 5.2 million ha of paddy fields will be left. If the per capita consumption pattern remains at 110 kg/year, then in 2045, the need for additional food will be 25.9 million tons of MDG. Despite the increase in productivity and cropping index for all types of paddy fields, it turns out that the national food needs are still short of 3.97 million tons of GKG by 2045. Therefore, policy support and strong will from various parties, especially the central and regional governments, are needed to determine the priority scale, especially in fulfilling national strategic programs that do not sacrifice paddy fields to maintain food security. The

[6] Zhihui Zhang et al., "Socio-Economic Impacts of Agricultural Land Conversion: A Meta-Analysis," *Land Use Policy* 132 (2023): 106831, https://doi.org/https://doi.org/10.1016/j.landusepol.2023.106831.

[7] Dahiri Dahiri, "Analisis Kritis Terhadap Implementasi Perlindungan Lahan Pertanian Pangan Berkelanjutan," *Jurnal Budget : Isu Dan Masalah Keuangan Negara*, 2021, https://doi.org/10.22212/jbudget.v6i1.54.

[8] Rahayu Subekti, Adi Sulistiyono, and I. Gusti Ayu Ketut Rachmi Handayani, "Solidifying the Just Law Protection for Farmland to Anticipate Land Conversion," *International Journal of Economic Research* 14, no. 13 (2017): 69–79.

[9] Soediro, *Masyarakat Kontra Produktif : Kacamata Hukum* (Purwokerto: Amerta Media, 2022).

[10] Andi Rachman Salasa, "Paradigma Dan Dimensi Strategi Ketahanan Pangan Indonesia," *Jejaring Administrasi Publik*, 2021, https://doi.org/10.20473/jap.v13i1.29357.

Presidential Regulation on Control of Paddy Field Conversion (2019) must be operationalized in the field and reduce the conversion rate.[11]

Apart from the government, the community factor as a participant in maintaining agricultural land is also significant. Irene defines *participation* as the mental and emotional involvement of a person in a group situation that encourages them to support the achievement of goals in the group's goals and take responsibility for the group that aims to meet the needs desired by the community.[12] Community involvement in the form of participation supports the success of programs provided by the government.[13]

The provisions on public participation or community participation to realize Sustainable Food Agricultural Land *(Lahan Pertanian Pangan Berkelanjutan - LP2B)* are regulated in Article 67, paragraphs (1), (2), and (3), Article 68, and Article 69 of the Protection of Sustainable Food Agricultural Land Law (2009). Article 67, paragraph (1), explains that the community participates in the protection of Sustainable Food, Agricultural Areas, and Land. Meanwhile, paragraph (2) explains that community participation, as referred to in paragraph (1), can be done individually and in groups. However, the participation expected to oversee land conversion is sometimes not carried out properly by the community itself. As Identification and clarification of Legal facts with Hardiansyah on March 25, 2024, Management of the Indonesian National Construction Executives Association (Gapensi) of Banyumas Regency, Central Java Province. Based on his experience, the community encourages the conversion of agricultural land into housing.

Research by Wiraguna et al (2019), highlights the importance of the involvement of various parties, such as the government, the community, the private sector, and social institutions, in overcoming the problem of conversion of paddy fields. The results concluded that interventions against the factors that cause the conversion of paddy fields are necessary. The three main approaches proposed are regulation, management, and incentivization. The regulatory approach is applied through the government's establishment of the Regional Spatial Plan *(Rencana Tata Ruang Wilayah - RTRW)*. The management approach is carried out through the establishment of sustainable subak areas as part of efforts to maintain sustainable food agricultural land. The approach of providing

[11] Mulyani et al., "Analisis Kapasitas Produksi Lahan Sawah Untuk Ketahanan Pangan Nasional Menjelang Tahun 2045."

[12] Diradimalata Kaehe, Joorie M Ruru, and Welson Y Rompas, "Partisipasi Masyarakat Dalam Perencanaan Pembangunan Di Kampung Pintareng Kecamatan Tabukan Selatan Tenggara," *Jurnal Administrasi Publik* 5, no. 80 (2019): 14–24.

[13] Hasan Basri et al., "Partisipasi Masyarakat Dalam Merumuskan Kebijakan Pada Musrenbang Kampung," *Jurnal Kebijakan Publik* 13, no. 1 (2022): 25–32, https://doi.org/http://dx.doi.org/10.31258/jkp.v13i1.7997.

incentives, one of which is done through fertilizer subsidies to farmers. In addition, controlling the conversion of paddy fields is also done through a community participation approach. This research provides an essential foundation for policymakers in dealing with the problem of conversion of paddy fields to meet the need for urban green open space.[14]

Chaireni et al (2020) identified a number of challenges in realizing sustainable food security in Indonesia. These challenges include a high population growth rate, leading to a significant increase in food consumption; a reduction in agricultural land area due to land conversion or land use change; and dependence on imports to meet the needs of several strategic food commodities. In addition, low adoption of agricultural technology due to constraints in technology transfer from formal research institutions to farmers is also an obstacle to increasing productivity. To overcome these challenges, the research formulated measures such as increasing crop productivity, expanding agricultural areas, and formulating solution-oriented policies. The research provides an in-depth look at the complexity of food security issues in Indonesia and provides directions for further action in achieving sustainable food security in the country.[15]

This research has a significant novelty in revealing the vital role of public participation in the conversion of agricultural land to achieve national food security. In contrast to previous studies that focused more on government policies or other external factors, this study specifically highlights how the community supports agricultural land conversion. This action is driven by several factors: economic, socio-cultural, demographic, land value, and technical factors. This more comprehensive approach provides a new and more in-depth perspective on the dynamics on the ground and how policies can be adjusted to accommodate the aspirations and needs of the community.

This research makes a valuable contribution to the international community by offering new insights into the dynamics of public participation in agricultural land conversion, particularly in the context of national food security. By identifying the economic, socio-cultural, demographic, land value, and technical factors that drive communities to support land conversion, this research helps global stakeholders understand how local interactions can influence agrarian policy and food security. The findings can serve as a reference for other countries in designing

[14] I Gusti Agung Adi Wiraguna, Ngakan Putu Sueca, and I Made Adhika, "Pengendalian Alih Fungsi Lahan Sawah Sebagai Upaya Pemenuhan Ruang Terbuka Hijau Kota (RTHK) Di Kota Denpasar," *RUANG-SPACE, Jurnal Lingkungan Binaan (Space : Journal of the Built Environment)* 6, no. 1 (2019): 85, https://doi.org/10.24843/jrs.2019.v06.i01.p07.

[15] Reni Chaireni et al., "Ketahanan Pangan Berkelanjutan," *Jurnal Kependudukan Dan Pembangunan Lingkungan* 1, no. 2 (2020): 70–79.

more inclusive and effective strategies to manage land conversion, thus supporting global efforts to achieve sustainable food security and reduce vulnerability to climate change and urbanization pressures. The problems raised in this research are formulated as follows: First, what are the factors that cause the conversion of agricultural land? Second, to what extent does public participation influence decisions related to agricultural land conversion? Third, how can land conversion be suppressed by increasing public participation in order to realize National Food Security?

Method

This research aims to explore the role of public participation in the process of agricultural land conversion in an effort to achieve national food security. The approach used in this research includes analyzing laws and regulations related to agriculture and food security that are applicable and relevant to the issues discussed. The data used is secondary data obtained through literature studies, documents, and reports related to agriculture, food security, and public participation in decision-making related to the conversion of agricultural land. In analyzing the role of public participation, this research uses two main approaches. First, the statute approach is used to examine regulations related to public participation in agricultural land conversion policies in Indonesia. This approach allows researchers to understand the legal framework that regulates public involvement in the decision-making process related to agricultural land conversion. The case approach, a method employed in normative research, focuses on examining the practical application of legal norms or rules. This approach is particularly relevant to analyzing cases that have already been decided, as exemplified in legal jurisprudence.[16]

This type of research is normative juridical research, namely legal research conducted by examining library materials or secondary data.[17] The data source used is secondary data in the form of primary legal materials. This research includes laws and regulations related to agriculture and food security that apply in Indonesia. Meanwhile, secondary legal materials in the form of books, scientific articles, reports, and proceedings will be used to support the analysis and discussion in this research, providing a broader understanding of the concepts,

[16] Johnny Ibrahim, *Teori Dan Metodologi Penelitian Hukum Normatif* (Malang: Bayu Media Publishing, 2012).

[17] Soerjono Soekanto & Sri Mamudji, *Penelitian Hukum Normatif, Suatu Tinjauan Singkat* (Jakarta: Raja Grafindo Persada, 2003).

issues, and practices related to public participation in the context of agricultural land conversion in Indonesia.

Discussion

1. Factors Causing Agricultural Land Conversion

The economic factors driving agricultural expansion are often related to the comparative value of agricultural and non-agricultural land and the expenses involved in converting non-agricultural land. Increased profits from farming, achieved through improved agricultural technology and easier access to markets, have been recognized as significant factors in promoting agricultural growth. Foreign investments in agriculture, particularly for crops used as feed and fuel, have also been found to encourage agricultural expansion.[18] Based on Prabowo and team's research, the high land rent obtained by non-agricultural sector activities compared to the agricultural sector. The low incentive to farm is due to high production costs, while the price of agricultural products is relatively low and fluctuates. In addition, the increasingly urgent needs of farming families have led to land conversion.[19]

Research conducted by Wiraguna et al (2019) showed that Farmers earn the least compared to professions in other fields. In comparison with other informal work sectors, such as income obtained from trading groceries, it is possible to get an average net income of Rp1.500.000,00 per month. This condition is much better than the income earned by farmers. The average income obtained from rice harvesting is low. The income earned by landowners ranges from Rp2.700.000,00 to Rp3.400.000,00 per growing season or around Rp675.000,00 to Rp850.000,00 per month. The high cost of production compared to the relatively low and fluctuating price of agricultural products is a driving factor in the conversion of paddy fields in Denpasar City. High family needs and pressured by the need for business capital or family needs are other economic factors that influence the rapid conversion of paddy fields.[20]

A similar thing also happened in the Malang district, precisely in Mulyoagung village. Agricultural land in Mulyoagung Village was previously productive agricultural land. However, since 2015, there have been frequent changes in the

[18] Nugun P. Jellason et al., "A Systematic Review of Drivers and Constraints on Agricultural Expansion in Sub-saharan Africa," *Land* 10, no. 3 (2021): 1–17, https://doi.org/10.3390/land10030332.

[19] Rossi Prabowo, Aziz Nur Bambang, and Sudarno, "Pertumbuhan Penduduk Dan Alih Fungsi Lahan Pertanian," *Mediagro*, 2020.

[20] Wiraguna, Sueca, and Adhika, "Pengendalian Alih Fungsi Lahan Sawah Sebagai Upaya Pemenuhan Ruang Terbuka Hijau Kota (RTHK) Di Kota Denpasar."

function of agricultural land to non-agricultural land, one of which is as a cafe. Based on research conducted by Samsi et al (2022), this is due to the fact that farming income with one harvest, such as rice planted, earns 1.5 million to 2 million according to the land area, not including other costs incurred. Compared to renting out the land for a café, the income is 2 to 3 times more, and the rent increases yearly. So, landowners prefer to rent out their land for cafes rather than for the agricultural sector, improving the family economy.[21]

From the results of the analysis that Evatul Casanova Noviyanti and Irwan Sutrisno on SP 3 Kuala Kencana District and SP 1 Wania District Mimika Regency found that there was a significant difference in the average income of farmers before converting their land worth Rp28.109.863,00 and after converting their land to Rp34.906.863,00 with an average difference of Rp6.797.000,00 which means that with farmers converting their land, farmers' income obtained a more significant increase than income before converting their land. This condition is because there is a fixed monthly income, even though it is uncertain, which is obtained from boarding house rent, fishing rent, bathing tours, and other sales from store and shophouse compared to when the land becomes agricultural land, which is not necessarily a fixed income.[22]

A study conducted by Rondhi et al (2019) in Jember, East Java, reveals a significant disparity in land rental values between peri-urban and rural areas. In peri-urban areas, housing land rents are substantially higher than agricultural land rents. Conversely, in rural areas, agricultural land rents exceed those of housing. The most notable difference lies in the substantial gap between agricultural and housing land rents in peri-urban areas, which is significantly wider than in rural areas. On average, agricultural land rent in peri-urban areas is Rp4.447,00 per square meter per year, while housing land rent is Rp39.904,00 per square meter per year. In rural areas, the average agricultural land rent is Rp6.047,00 per square meter per year, and housing land rent is Rp 5,059 per square meter per year. This substantial gap in peri-urban areas, with housing land rents being approximately 700% higher, is the primary driver behind the rapid conversion of farmland in these regions. Furthermore, converted agricultural land in peri-urban areas commands even higher rental values when used for housing, often doubling the rent generated for agricultural purposes. In contrast, while having higher

[21] Nor Samsi, Fifik Wiryani, and Isdian Anggraeny, "Pengawasan Terhadap Alih Fungsi Lahan Pertanian Menjadi Kafe," *Indonesia Law Reform Journal* 2, no. 1 (2022): 18–31, https://doi.org/10.22219/ilrej.v2i1.20392.

[22] Evatul Casanova Noviyanti and Irwan Sutrisno, "Analisis Dampak Alih Fungsi Lahan Pertanian Terhadap Pendapatan Petani Di Kabupaten Mimika," *JURNAL KRITIS (Kebijakan, Riset, Dan Inovasi)* 5, no. 1 (2021): 1–14.

agricultural land rents, rural areas exhibit a much narrower gap with housing land rents, suggesting a lower propensity for land conversion. Although agriculture remains the dominant economic activity in rural areas, the relatively small difference in land rents indicates a potential for future conversion to non-agricultural uses.[23]

Economic factors are also one of the significant factors causing agricultural land conversion in Pandeglang Regency, Banten. Based on research conducted by Kusumastuti et al (2017) was found that the smaller the land owned, the more likely it is to release the land for non-agricultural purposes. This condition is because the smaller the land, the higher the production costs. Not only production costs, farmers in the area are also disadvantaged due to the prolonged trade chain. Most farmers still sell their crops to intermediaries, so the price of grain is highly dependent on the intermediaries. This condition leaves farmers without a good bargaining position. There is even a bonded mechanism that makes the community highly dependent on intermediaries.[24]

Low rice prices and rice productivity are also among the factors driving agricultural land conversion. In Pekalongan, agricultural land conversion is primarily caused by two main factors: low real paddy prices and declining paddy productivity. Data shows that real paddy prices at the farm level significantly negatively affect land conversion. When paddy prices are low, farmers' motivation to maintain and manage their farmland decreases drastically, which then encourages them to sell or convert the farmland. In addition, low paddy productivity also affects farmers' decision to maintain farmland. The decline in rice productivity in Pekalongan has led to an increase in the conversion of agricultural land to other more profitable uses or the abandonment of the land. For example, declining rice productivity significantly increases land conversion, as farmers find farming no longer profitable or sustainable. This finding is consistent with research in East Java, which shows that agricultural land is highly convertible when the value of agricultural products is low.[25]

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[23] Mohammad Rondhi et al., "Agricultural Land Conversion and Food Policy in Indonesia: Historical Linkages, Current Challenges, and Future Directions BT - Current Trends in Landscape Research," in *Current Trends in Landscape Research*, ed. Lothar Mueller and Frank Eulenstein (Cham: Springer International Publishing, 2019), 631–64, https://doi.org/10.1007/978-3-030-30069-2_29.

[24] Ayu Candra Kusumastuti, Lala M. Kolopaking, and Baba Barus, "Factors Affecting the Converstion of Agricultural Land in Pandeglang Regency," *Sodality: Jurnal Sosiologi Pedesaan* 6, no. 2 (2018): 131–36, https://doi.org/10.22500/sodality.v6i2.23234.

[25] Imade Yoga Prasada and Masyhuri, "The Conversion of Agricultural Land in Urban Areas (Case Study of Pekalongan City, Central Java)," *Agraris* 5, no. 2 (2019): 112–18, https://doi.org/10.18196/agr.5280.

Evi Zuriyani's research shows that cultural values in agricultural land management have been degraded, especially in urban areas. People, including the younger generation, tend to regard farming as a less prestigious occupation. Data from two sub-districts in Padang City, West Sumatra, show that the perception of cultural values in agriculture has faded, especially in rural areas adjacent to urban areas.[26]

Farmland used to have a social value beyond being a food source. Besides being a place where traditional culture, such as gotong royong, developed, it is now more often considered an economic asset. Many farmers are of the view that the spirit of gotong royong has diminished due to economic changes and higher household needs. The modernization of agriculture has also changed the way of working in the fields, from *gotong royong* to a daily wage or piece-rate system.[27] This situation has consequences for the loss of the "sacredness" of agricultural land, making the conversion of agricultural land inevitable if its economic value is more significant.

In addition, the socio-cultural factor that has triggered the conversion of agricultural land in this context is the existence of a system of distribution of inheritance rights that applies in the community. As is well known, agricultural land is an inherited asset with strategic value. This inheritance will trigger land conversion in the Mangupura Urban Area of Badung Regency when the land (its economic value/utilization) must be divided among the heirs into smaller parts. It is not uncommon to find cases where the results of this division of inheritance give rise to plots of land with a physical scale that does not allow (technically and economically) to be utilized as agricultural land. The solution is to buy and sell the land, which then leads to a change in its use by the new owner.[28]

Another social factor is the younger generation's loss of interest in agriculture. *Farming* is a noble profession that provides food, clothing, and housing for many people. Nevertheless, over time, supported by the transformation of the economic structure, farming is no longer a symbol of social status in society. From the viewpoint of many people, especially the viewpoint of the younger generation, the farming profession is considered less prestigious. The farming profession is considered "uncool". This perception has made the farming profession unpopular

[26] Elvi Zuriyani, "Faktor-Faktor Yang Mempengaruhi Keputusan Petani Melakukan Alih Fungsi Lahan Pertanian Ke Lahan Non Pertanian Di Kecamatan Kuranji Dan Kecamatan Koto Tangah Kota Padang," *Jurnal Pelangi* 4, no. 2 (2012): 87–99, https://doi.org/10.22202/jp.2012.v4i2.12.

[27] Zuriyani.

[28] I Putu Anom Widiarsa and Gusti Ayu Made Suartika, "Pengendalian Alih Fungsi Lahan Pertanian Di Kawasan Perkotaan Mangupura Kabupaten Badung," *RUANG-SPACE, Jurnal Lingkungan Binaan (Space : Journal of the Built Environment)* 5, no. 2 (2018): 134, https://doi.org/10.24922/jrs.v5i2.42995.

and less attractive to the younger generation. A similar situation is found in Italy's Gargano region, a mountainous area with approximately 170,000 residents. Despite the importance of agriculture, especially olive oil and vegetable cultivation, the region faces challenges such as land abandonment related to the outmigration of young people seeking better employment prospects elsewhere.[29]

There are many people who work as farmers but do not include "farmer" in their identity cards (*Kartu Tanda Penduduk, KTP)* on their occupational identity. This public perception of the farming profession makes farming a last resort for livelihood. In addition, the increasing number of farmers who wish to switch professions from farming to pursue businesses in other fields has resulted in more and more food agricultural land, especially paddy fields, not being worked on seriously. Land that is not cultivated thoughtfully makes it is very easy to change ownership and functions. The younger generation also prefers professions in the industrial and service sectors, which they consider to be more secure for their lives and have a higher economic exchange value. Under these conditions, farming is marginalized. Farmland tends to be sold to capital owners to develop non-agricultural business activities, while the land sellers use the proceeds from the sale of farmland for business capital in other sectors. Farming (on farms), especially rice farming, is less attractive to younger people. Even if farmers are still generally of productive age, the average age is >40 to 60 years. The younger generation is more interested in industry and services, even if only as laborers. This condition illustrates that the agricultural sector has not been able to provide compensation rewards equivalent to those of other business sectors for the resources and labor devoted.[30]

Another socio-cultural factor driving the conversion of agricultural land is the level of education, as in the research conducted by Atika Fikri Tsani, Yunastiti Purwaningsih, and Akhmad Daerobi in Depok sub-district, Sleman district, Yogyakarta. A positive and significant correlation exists between educational attainment and a farmer's decision to convert agricultural land. Farmers with a senior high school education or higher are more likely to convert their land compared to those with a junior high school education. This situation is likely due to the belief that higher education equips individuals with opportunities beyond agriculture, incentivizing land conversion. The regression coefficient of 5.5918 and odds ratio of 268.2192 indicate that farmers with senior high school or higher

[29] Nazgul Esengulova et al., "Key Drivers of Land Use Changes in the Rural Area of Gargano (South Italy) and Their Implications for the Local Sustainable Development," *Land*, 2024, https://doi.org/10.3390/land13020166.

[30] Hendar Nuryaman Suprianto, Eri Cahrial, "Faktor-Faktor Pendorong Alih Fungsi Lahan Sawah," *Agristan* 1, no. 1 (2019): 12–30, https://doi.org/https://doi.org/10.37058/ja.v1i1.1364.

education are 268.2192 times more likely to convert their land, controlling for other factors. Given agriculture's substantial contribution to GDP, governments and educational institutions should prioritize guiding and motivating the younger generation to value the agricultural sector. Farmers are also encouraged to share their knowledge of paddy field management with their children and younger family members to ensure a sustainable agricultural future in this agrarian nation.[31]

The process of conversion of agricultural land to developed land is inevitable as the population grows. Humans permanently put natural and semi-natural areas under pressure, adapting them to their needs.[32] Research by Hidayat and Rofiqoh shows that population has a positive effect on the area of land conversion; if the population increases by 100 people per year, there will be an increase in the area of agricultural land conversion by 0.002 Ha.[33] Research in Kupang shows a similar value; based on the study, it was found that for every 100-person increase in population per year, 0.03 hectares of agricultural land is converted.[34] It also happens in Southeast Minahasa; every time there is an increase in population by one person, there will be a decrease in agricultural land area by 0.577 Ha.[35]

Demographic factors accompanied by livelihood shifts are a driving factor in the conversion of agricultural land, which also occurred in Pandak Gede Village, Kediri District, Tabanan Regency, Bali. The total population in Pandak Gede village from 2001 to 2018 increased by 31.38%, with a significant percentage increase occurring from 2001 to 2012, namely 28.8%. This increase in population was followed by a shift in the livelihood structure of the population from agriculture to the service sector. Between 2001 and 2017, the number of people working in the agricultural sector decreased from 60% to 27%, and the number of people working in the service sector from 22% in 2001 to 67% in 2018. This condition clarifies the population's livelihood structure shift from agriculture to trade and services. The

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[31] Atika Fikri Tsani, Yunastiti Purwaningsih, and Akhmad Daerobi, "Factors Affecting Farmer's Decision in Converting The Function of Agricultural Lands," *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan* 19, no. 1 (2018): 1, https://doi.org/10.23917/jep.v19i1.4435.

[32] Katarzyna Kocur-Bera and Adrian Pszenny, "Conversion of Agricultural Land for Urbanization Purposes: A Case Study of the Suburbs of the Capital of Warmia and Mazury, Poland," *Remote Sensing* 12, no. 14 (2020): 1–21, https://doi.org/10.3390/rs12142325.

[33] Syarif Imam Hidayat and Lisanul Latifatul Rofiqoh, "Analisis Alih Fungsi Lahan Pertanian Di Kabupaten Kediri," *Jurnal Social Economic of Agriculture* 9, no. 1 (2020): 59, https://doi.org/10.26418/j.sea.v9i1.40646.

[34] Erastus Daddu Ngadi and Alfetri N.P. Lango Lika Bernadina, "Analisis Faktor-Faktor Yang Mempengaruhi Alih Fungsi Lahan Pertanian Ke Lahan Non-Pertanian Di Kota Kupang," *Buletin Ilmiah IMPAS* 22, no. 2 (2021): 162–70, https://doi.org/https://doi.org/10.35508/impas.v22i2.4913.

[35] Christianto . Pondaag, Caroline B. D. Pakasi, and Ribka M. Kumaat, "Faktor-Faktor Yang Mempengaruhi Terjadinya Alih Fungsi Lahan Pertanian Di Kabupaten Minahasa Tenggara," *Agri-Sosioekonomi* 14, no. 2 (2018): 151–58, https://doi.org/10.35791/agrsosek.14.2.2018.20575.

increase in population in Pandak Gede Village, along with the shift in the structure of people's livelihoods and ownership of agricultural land, has led to the conversion of agricultural land into residential areas.[36]

The aging of the population can also be a contributing factor to the conversion of agricultural land, as was the case in Matsusaka City, Japan. The decline in the number of farmers in the city, caused by an increase in the elderly population, is the leading cause of agricultural land conversion in the region. Data shows that between 2006 and 2021, the population over 65 years old increased by 13.85% in plain areas such as Kamata-cho, while the number of farmers decreased dramatically by 26.67%. In mountainous areas such as Ureshino Obara-cho, the number of farm managers decreased by 50%, and the population over the age of 65 decreased by 43.48%. As a result, many farms have been abandoned and converted to housing or turned into wastelands and forests. Overall, agricultural land decreased by 13.4%, while building land increased by 11.9% and abandoned land increased by 3.7%. This situation reflects how population aging significantly affects the ability of local communities to maintain agricultural activities, which in turn drives land use change in Matsusaka City.[37]

The decline in agricultural productivity that causes the conversion of agricultural land is also caused by an aging population in Malaysia. While agricultural transformation has been recognized as helping the country achieve the expected economic growth and development to become a high-income country under the National Transformation 2050 plan (2021-2050), the aging of farmers will be an obstacle to achieving this ambition. The aging problem will exacerbate the rural-urban income gap. Government responses to the aging of farmers vary. For example, in France and Korea, the government has been buying out aging farmers, granting them secure lifelong pensions, and attracting young agropreneurs after farm consolidation. In Malaysia, the aging of farmers has led to reliance on migrant labour as a source of labour.[38]

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[36] Ahmad Sidiq, Ida K Armeli, and NI K A Siwalatri, "Strategi Pengendalian Alih Fungsi Lahan Pertanian Di Desa Pandak Gede Kabupaten Tabanan," *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan (Journal of Natural Resources and Environmental Management)* 10, no. 2 (2020): 329–37, https://doi.org/10.29244/jpsl.10.2.329-337.

[37] Yuki Sofue and Ryo Kohsaka, "Conversion Patterns of Agricultural Lands in Plains and Mountains: An Analysis of Underpinning Factors by Temporal Comparison with Geographically Weighted Regression in Depopulating Rural Japan," *Environmental and Sustainability Indicators* 22 (2024), https://doi.org/10.1016/j.indic.2024.100346.

[38] Akeem Olaniyi and Ahmad Abdullah, "Characterization of Drivers of Agricultural Land Use Change," *TeMA - Journal of Land Use, Mobility and Environment* 14, no. 3 SE-LUME (Land Use, Mobility and Environment) (December 2021), https://doi.org/10.6093/1970-9870/8065.

The growth of urban areas has implications for the emergence and increasing competition for land to accommodate the diverse needs generated by various development sectors. What often happens is that there is an imbalance between the demand and availability of land, given that an increase in demand will never be accompanied by an increase in supply. As is well understood, land is a finite, non-renewable resource that supports production. This statement may be undermined by the argument that reclamation activities will be able to provide hectares of new land. However, in light of the recent phenomenon of global warming and the alarming rise in sea levels, we are forced to question the relevance of reclamation activities which forces us to view the existence of land, which nature has provided, as a scarce resource. Consequently, this condition has triggered an escalation in the economic value of land everywhere.

This escalation has occurred especially for lands that are geographically located within a radius of the city center. In this study, the closer the location of a plot of land is to the city center, in this case, Sempidi Sub-district as the Central Business District (CBD), will directly increase its economic value. However, it should also be realized here that the community perception factor also has an essential contribution in this regard. Land users have a high interest in congregating, scrambling for land, and doing activities in the city center when compared to outside the radius of the urban area.[39]

Based on an interview conducted by Rahman et al (2022) with one of the developers in Jeneponto Regency, South Sulawesi, the developer carried out housing development on agricultural land because of economic factors, the prospect of housing investment is much more promising for greater profits than relying on land utilization for agriculture. According to Mr Karaeng Gassing, the developer of Turatea Permai housing, although his land is designated by the local government as agricultural land, he prefers to use his land for housing investment because it provides more benefits than agriculture because his land is a rain-fed rice field so the productivity is low. Mr. Hasan, a resident of Sidenre Village, Binamu Sub-district, who owns a plot of land that was sold to a Sanur housing developer, said that although his land is productive, he was forced to sell to the developer because since a residential area was built near his land, the housing waste has polluted his land so that the level of soil fertility can gradually decrease,

[39] Widiarsa and Suartika, "Pengendalian Alih Fungsi Lahan Pertanian Di Kawasan Perkotaan Mangupura Kabupaten Badung."

besides that he also could not refuse the offer from the developer who valued his land at a high enough price.[40]

Technical factors that affect the physical characteristics of paddy fields include: (a) irrigation system, (b) soil type, (c) fertility, (d) cropping index/IP, (e) agroclimate, (f) productivity, and others. Among the various factors that often become a limitation in the implementation of rice farming is the adequacy of water, especially in rice fields located in the downstream irrigation in the growing season gadu. Although the classification of rice fields is included in the category of irrigated land, but often experience water shortages. The main causative factor is that the water discharge in the irrigation canal concerned is insufficient to irrigate all rice fields downstream. Irrigated land that often experiences water shortages is easy to convert to other functions.[41]

Small water discharge is a technical factor causing land conversion in accordance with research conducted by Ni Luh Budhi Arsini and I Gede Surata in three areas in Buleleng Regency, namely Anturan Village, Baktiseraga Village and Bayuning Village. The small water discharge makes it difficult for farmers to cultivate the land. From the research, it was also found that the phenomenon of engineering or misuse of land around the river flow by upstreams/developers in the upstream river caused a decrease in water discharge so that the community's rice fields were dry; when the rice fields were dry, and the yields were not optimal, it caused the community to be interested in selling them because it felt more profitable to sell them to upstreams/developers than to be managed as a place to grow crops.[42]

2. Efforts to Suppress Land Conversion by Increasing Community Participation

In order to restrain the growth rate of land conversion, a holistic and comprehensive strategy for controlling agricultural land conversion is needed. In other words, the conversion of agricultural land must be the concern of many parties. The parties in question are on a pedestal with a fairly broad dimension, namely, all levels of society or stakeholders directly related to agricultural land

[40] Sufirman Rahman, Hardianto Djanggih, and Futri Patrisia, "Implementasi Hukum Terhadap Alih Fungsi Lahan Pertanian Menjadi Lahar Perumahan Di Kabupaten Jeneponto," *Indonesia Journal of Criminal Law* 4, no. 1 (2022): 94–111, https://doi.org/https://doi.org/10.31960/ijocl.v2i2.431.

[41] Suprianto, Eri Cahrial, "Faktor-Faktor Pendorong Alih Fungsi Lahan Sawah."

[42] Ni Luh Budhi Arsini and I Gede Surata, "Akibat Hukum Dari Alih Fungsi Lahan Pertanian Pangan Berkelanjutan Terhadap Penguasaan Dan Pemilikan Tanah Pertanian Di Kecamatan Buleleng, Kabupaten Buleleng," *Kertha Widya* 8, no. 1 (2020): 1–20, https://doi.org/10.37637/kw.v8i1.636.

conversion. In this regard, a rationale is needed for a land conversion control strategy that relies on the community.[43]

The strategy for controlling the conversion of agricultural land that relies on community participation is to involve the active participation of all stakeholders as an entry point for planning, implementation, supervision, and assessment (focus of analysis) of existing laws and regulations. However, it should be underlined that community participation will not be realized if it is not accompanied by an approach in the form of socialization and advocacy. This situation is because the community has a plurality typology, which, among others, is characterized by social differences (stratification) with ties to rules, institutions, and behavior.[44]

Indonesia is an agrarian country, where agriculture is the main base of the national economy. Under agrarian reform and applicable regulations relating to the rearrangement of control, ownership, use, and utilization of existing resources in an area, especially in the agricultural sector itself, it has been stipulated in the regulations of The Protection of Sustainable Food Agricultural Land Law (2009) as a system and process in planning and establishing, developing, utilizing, and fostering, controlling, and sustainably supervising food agricultural land. The protection of food agricultural land is an integral part of regional spatial planning. This action is in accordance with Government Regulation on The Determination of Areas and the Conversion of Functions of Sustainable Food Agricultural Land (2011) which defines agricultural land areas that are designated to be protected and developed consistently in order to produce staple food for national food independence, security and sovereignty.[45]

However, this law is considered ineffective considering that the definition of Agricultural Land regulated is too broad and most Regional Governments have not established Regional Regulations on Sustainable Food Agricultural Land (LP2B). The conversion of agricultural land into non-agricultural land is increasing significantly and seriously impacts national food security. To overcome this, the Presidential Regulation on Control of Conversion of Paddy Fields (2019) was

[43] Iswan Kaputra, "Alih Fungsi Lahan, Pembangunan Pertanian Dan Kedaulatan Pangan," *Jurnal Strukturisasi* 1, no. 1 (2015): 25–39.

[44] Muhammad Iqbal and Sumaryanto, "Strategi Pengendalian Alih Fungsi Lahan Pertanian Bertumpu Pada Partisipasi Masyarakat," *Analisis Kebijakan Pertanian* 5, no. 70 (2007): 167–82, https://doi.org/10.21082/akp.v5n2.2007.167-182.

[45] Ahmad Syawal, Muhlis Madani, and Nuryanti Mustari, "Implementasi Kebijakan Perlindungan Lahan Pertanian Pangan Berkelanjutan Di Kota Makassar," *JPPM: Journal of Public Policy and Management* 3, no. 2 (2021): 93–107, https://doi.org/10.26618/jppm.v3i2.5941.

formed as an effort and breakthrough for the Government to control the conversion of paddy fields as protected land.[46]

Presence of the Presidential Regulation on Control of Conversion of Paddy Fields (2019) is the legal basis for controlling the conversion of paddy fields, which aims to accelerate the determination of protected paddy fields. These protected paddy fields are in order to fulfill and maintain the availability of paddy fields to support national food needs, control the increasingly rapid conversion of paddy fields, empower farmers not to convert paddy fields and provide data and information on paddy fields for the determination of sustainable food agricultural land.[47]

In the Presidential Regulation, there are provisions to provide incentives for Protected Rice Fields. These povisions are contained in the following articles:

Part Two

Incentives for Protected Rice Fields

Article 18

Incentives for protected paddy fields are provided by the Central Government to the Regional Government and the community.

Article 19

(1). The Provision of intensive by the Central Government to the Regional Government, as referred to in Article 18, is carried out if;

a. In the Regional Government area, there are Paddy Fields included in the protected Paddy Field map as referred to in Article paragraph (1); and/or

b. The Regional Government determines that Paddy Fields included in the protected Paddy Field map be part of sustainable food agricultural land as referred to in Article 16 paragraph (1).

(2). Provision of incentives by the Central Government to the Regional Government, as referred to in paragraph (1), shall be implemented in accordance with the provisions of laws and regulations.

Article 20

(1). Provision of incentives by the Central Government to the community, as referred to in Article 18, shall be carried out if the community owns and/or manages Paddy Fields stipulated in the protected Paddy Field map, as referred to in Article 15 (1).

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[46] Diah Niken Sari & Meta Indah Budhianti, "Lahan Sawah Dilindungi Dikaitkan Dengan Rencana Tata Ruang Berdasarkan Peraturan Presiden Nomor 59 Tahun 2019," *Jurnal Reformasi Hukum Trisakti* 5, no. 4 (2023): 840–51, https://doi.org/10.25105/refor.v5i4.18366.

[47] Ferisa NurfauziyahMohamad Fajri Mekka Putra, "Implementasi Peraturan Presiden Nomor 59 Tahun 2019 Tentang Kebijakan Pengendalian Alih Fungsi Lahan Sawah Terhadap Para Pelaku Bisnis Perumahan," *Syntax Literate* 7, no. 11 (2022): 17561–69, https://doi.org/https://doi.org/10.36418/syntax-literate.v7i11.12177.

(2). Incentives for the community, as referred to in paragraph (1), can be in the form of assistance;

a. Agricultural facilities and infrastructure;
b. Irrigation facilities and infrastructure;
c. Acceleration of land certification; and/or
d. Other forms in accordance with the provisions of laws and regulations.

Article 21

The Provision of incentives, as referred to in Article 18, shall be carried out in accordance with the state's financial capacity.

Although the Provision of incentives can logically effectively suppress the conversion of paddy fields and even increase the number of protected paddy fields, this does not happen in reality. According to Nasution [48], There are three obstacles why the regulation of land use change control is difficult to implement, namely:

a. Policy Coordination Constraints. On the one hand, the government seeks to prohibit land conversion. However, on the other hand, it encourages land conversion through policies for the growth of industry/manufacturing and other non-agricultural sectors, which in reality use agricultural land.
b. Policy Implementation Constraints. Regulations controlling land conversion only mention provisions imposed on companies or legal entities that will use land and or will change agricultural land to non-agricultural land. Therefore, changes in the use of paddy fields to non-agricultural land carried out individually/individually have not been touched by these regulations, whereas land changes carried out individually are estimated to be very extensive.
c. Planning Consistency Constraints. The RTRW, which is then followed by a mechanism for granting location permits, is the main instrument for controlling and preventing the conversion of technically irrigated paddy fields. However, in reality, many RTRWs actually plan to convert technical irrigated paddy fields into non-agricultural land.

Public participation serves as a key strategy in curbing the widespread conversion of agricultural land into non-agricultural uses. Etymologically, "participation" refers to taking part or being involved in an activity. It signifies a person's mental and emotional engagement in a group, motivating the group to achieve a specific goal and take responsibility for the actions required to reach it.[49] Due to its numerous benefits, public participation is crucial in implementing development initiatives, such as spatial planning. Participation enhances efficiency

[48] Soediro, *Masyarakat Kontra Produktif : Kacamata Hukum*.

[49] Rofi Wahanisa et al., "Public Participation by Optimizing Rural Spatial Planning to Prevent Functional Conversion of Agricultural Land to Non-Agricultural Use," *Universal Journal of Agricultural Research* 9, no. 5 (2021): 149–55, https://doi.org/10.13189/ujar.2021.090501.

and reduces costs in public service delivery. It also fosters a sense of pride among participants, serving as a catalyst for further development. Moreover, participation promotes responsibility, ensures societal involvement, guarantees the right direction of work, facilitates knowledge sharing and skill integration, and reduces reliance on individual expertise. Additionally, participation raises public awareness of poverty, contributing to its eradication.[50]

Conclusion

The factors causing agricultural land conversion can be summarized as follows: (a) Economic factors, such as low incentives to farm due to high production costs, while the price of agricultural products is relatively low and fluctuates. (b) Socio-Cultural Factors: People, including the younger generation, tend to consider the farming profession as a less prestigious job; (c) Demographic Factors: Population has a positive effect on the area of land conversion if the population increases by 100 people per year, there will be an increase in the area of agricultural land conversion by 0.002 Ha; (d) Land Selling Value Factor, the closer the location of a plot of land to the city center will directly increase its economic value; (e) Technical Factors, The main causal factor is because the water discharge in the irrigation channel concerned is insufficient to irrigate all rice fields downstream. Irrigated land that often experiences water shortages is easy to convert. The strategy to control the conversion of agricultural land that relies on community participation is to involve the active participation of all stakeholders as an entry point for planning, implementation, supervision, and assessment (focus of analysis) of existing laws and regulations.

Participation is essential in development processes, including spatial planning, as it leads to better results and cost-effective public services and fosters a sense of pride among participants. It also acts as a catalyst for further development, encourages responsibility, ensures societal involvement, aligns efforts in the right direction, integrates diverse skills, and reduces dependency on individual expertise. With the various things that encourage the conversion of agricultural land, it is necessary to favor the farmers. By developing a cooperative system, the price of rice as a result of agricultural efforts can be controlled so that farmers are not disadvantaged. It is also necessary to improve the village development sector so that the younger generation is not encouraged to work in big cities. The spatial planning system must also be improved so that it does not give freedom to turn agricultural land into industrial or residential areas. Following

[50] Wahyu Ariyadi, "Empirical Analysis of Farmers Household Food Security Levels in Salatiga, Indonesia," *Research Horizon* 1, no. 1 (2021): 39–46, https://doi.org/10.54518/rh.1.1.2021.39-46.

the Presidential Regulation on Control of Paddy Field Conversion (2019), which is the legal basis for controlling the conversion of paddy fields, especially Article 20 paragraph (2), which regulates the provision of incentives to the community, must be realized in real terms. The provision of incentives can be in the form of assistance: a. Agricultural facilities and infrastructure; b. Irrigation facilities and infrastructure; c. Acceleration of land certification; and/or d. Other forms by statutory provisions. Other forms follow the provisions of laws and regulations. If this is done, it is expected that the conversion of agricultural land will be controlled in an effort to realize national food security.

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