Original Article

Implications of Agricultural Land Conversion for Sustainable Food Security: Evidence from Vietnam

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Abstract

Agriculture, as the primary source of food, is increasingly threatened by land-use conversion driven by urbanization, industrial expansion, and economic transformation—particularly in agrarian countries such as Indonesia and Vietnam. This research aims to analyze the patterns and driving factors behind agricultural land conversion in both countries, assess its impact on sustainable food security, and formulate appropriate policy solutions. Employing a normative legal approach combined with policy analysis, this study draws on primary and secondary data, including legal frameworks, academic literature, and national policies. The findings reveal three key insights. First, land-use change is predominantly driven by institutional weaknesses, legal ambiguities, and a pragmatic legal culture that fails to adequately safeguard agricultural land. Second, both countries exhibit similar trends in the conversion of productive farmland to non-agricultural uses, leading to reduced food land availability, ecological degradation, and socio-economic disruptions for farming communities. Third, a policy reconstruction is urgently needed—one that involves harmonized and enforceable regulations, institutional strengthening, and participatory economic mechanisms to ensure land protection. In conclusion, the study emphasizes the critical need for integrated and sustainable policy frameworks to maintain food security, promote environmental sustainability, and uphold social justice in the Southeast Asian region.

Keywords: Agriculture; Conversion; Land; Policy; Sustainable;

Introduction

Currently, agriculture serves as the main source of food for the global population and is one of the four fundamental factors of human needs. Since the World Food Summit (WFS) in 1996, massive efforts have been made to improve agricultural production and food security. This is determined by four main factors: (1) availability, such as access to productive land and agricultural production; (2) access, physically, socially, and economically; (3) utilization, such as food preparation and dietary diversity; and (4) stability in the first three dimensions.[1] Recently, in 2015, the United Nations (UN) established 17 Sustainable Development Goals (SDGs), with an important goal being Zero Hunger (SDG 2). Despite the significant efforts made in recent decades to develop strategies and policies aimed at achieving global food security, currently, about one in ten people worldwide suffer from severe food insecurity. Demographic shifts and ongoing urban expansion, coupled with global climate change, have caused significant transformations in the world's agricultural landscape.[2]

Countries in Asia have witnessed significant transformations in agricultural land over the past few decades. During the period from 1961 to 2015, agricultural land remained constant

[1] Amy Molotoks, Pete Smith and Terence P. Dawson, 'Impacts of Land Use, Population, and Climate Change on Global Food Security', *Food and Energy Security*, 10.1 (2021) <https://doi.org/10.1002/fes3.261>.
[2] Cláudia M. Viana and others, 'Agricultural Land Systems Importance for Supporting Food Security and Sustainable Development Goals: A Systematic Review', *Science of The Total Environment*, 806 (2022), 150718 <https://doi.org/10.1016/j.scitotenv.2021.150718>.

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in 8 countries, decreased in 10, and increased in 29. Countries that have lost a significant amount of agricultural land include Brunei Darussalam (a decrease of 66.7% compared to 1961), Japan (48%), South Korea (35.3%), and Mongolia (24.6%). The top five countries that have experienced the highest growth rates in agricultural land are Malaysia (49.5%), Vietnam (47.8%), the United Arab Emirates (44.5%), and Bhutan (40.7%). China (153 %), Indonesia (18.6 %), and Saudi Arabia (87.2 %) have converted large areas into agriculture, while Mongolia (27.8 %) and Iran (13.7 %) have lost significant agricultural land during the same period. The sources of land differ for the countries that have acquired agricultural land. A significant amount of agricultural land comes from the 'other land' category in China and Saudi Arabia, and in Indonesia, the gain in agricultural land comes from forests. Similarly, afforestation or other land use categories cause the loss of agricultural land in Iran and Mongolia.[3]

This phenomenon is particularly evident in densely cultivated agricultural areas in Southeast Asia, including countries like Vietnam and Indonesia.[4] Population growth, economic development, and urbanization in several countries are rapidly advancing, but land planning clearly does not keep pace. Current land resources, productive agricultural land, and the increasing demand for land, especially for housing, infrastructure, and industrial zones, present intense contradictions.[5] Recent studies have revealed that population migration and anthropogenic activities are significant factors leading to substantial changes in land use and ecosystem service supply across different temporal and spatial scales.[6] The increasing global population, urbanization, and non-food agricultural production, among other human activities, are driving the loss of productive agricultural land.[7] Moreover, the projected areas of urban expansion intersect with some of the most productive agricultural lands in the world, particularly in Asia and Africa. Therefore, agricultural land use and change are key considerations for the sustainability transition. The conversion of agricultural land, especially rice fields, is a challenge faced in the twenty-first century, particularly in biodiversity-rich tropical regions.[8]

Over the past two decades, Indonesia has experienced a significant surge in the conversion of agricultural land to non-agricultural use, directly influenced by various structural dynamics, such as rapid population growth, rural-to-urban migration (urbanization), and the push for national economic expansion. This process has given rise to new urban centers that are not only more spatially extensive but also more demographically dense and dynamic in economic activities. As the fourth most populous country in the world, Indonesia's population is estimated to reach 283.49 million by 2025. This increase in population is accompanied by a shift in demographic composition, where

[3] S.V.R.K. Prabhakar, 'A Succinct Review and Analysis of Drivers and Impacts of Agricultural Land Transformations in Asia', *Land Use Policy*, 102 (2021), 105238 <https://doi.org/10.1016/j.landusepol.2020.105238>.

[4] Morakot Worachairungreung and others, 'Monitoring Agricultural Land Loss by Analyzing Changes in Land Use and Land Cover', *Emerging Science Journal*, 8.2 (2024), 687–99 <https://doi.org/10.28991/ESJ-2024-08-02-020>.

[5] Xiuhua Shi, Fei Zhou and Zhe Wang, 'Research on Optimization of Ecological Service Function and Planning Control of Land Resources Planning Based on Ecological Protection and Restoration', *Environmental Technology & Innovation*, 24.101904 (2021), 1–17 <https://doi.org/10.1016/j.eti.2021.101904>.

[6] Aoyang Wang and others, 'Spatial-Temporal Dynamic Evaluation of the Ecosystem Service Value from the Perspective of "Production-Living-Ecological" Spaces: A Case Study in Dongliao River Basin, China', *Journal of Cleaner Production*, 333 (2022), 130218 <https://doi.org/10.1016/j.jclepro.2021.130218>.

[7] Abdul Rehman and others, 'Sustainable Agricultural Practices for Food Security and Ecosystem Services', *Environmental Science and Pollution Research*, 29.56 (2022), 84076–95 <https://doi.org/10.1007/s11356-022-23635-z>.

[8] Felicia O. Akinyemi and Chinwe Ifejika Speranza, 'Agricultural Landscape Change Impact on the Quality of Land: An African Continent-Wide Assessment in Gained and Displaced Agricultural Lands', *International Journal of Applied Earth Observation and Geoinformation*, 106 (2022), 102644 <https://doi.org/10.1016/j.jag.2021.102644>.

the urban population is growing progressively from around 50% in 2010, increasing to 57% in 2020, and predicted to reach 67% by 2050. This growth directly impacts land use changes, with an urban area expansion rate of 1.1% per year, causing urban areas to increasingly dominate land spaces that previously functioned as agricultural zones. This rapid urbanization not only alters the spatial structure but also triggers complex socio-economic transformations. On one hand, there is an increase in the welfare of certain segments of society classified as the middle class, which, according to World Bank reports, are experiencing faster growth compared to other groups. Rising and more diverse consumption patterns reflect this increase. These shifts in consumption patterns create new markets and opportunities for businesses, further fueling economic development in urban areas. However, this growth often comes at the expense of the lower-income populations, who may face displacement and reduced access to essential services. However, on the other hand, there are still groups in society that are lagging and vulnerable to marginalization, especially those who have lost access to land due to uncontrolled conversion. This disparity indicates that the ongoing urbanization process is not yet fully inclusive and has the potential to widen social gaps if not balanced with fair and sustainable spatial management policies.[9]

Land conversion, especially agricultural land, places us in a dilemma between the need for development and efforts to maintain food security.[10] The massive conversion of agricultural land into non-agricultural areas has posed serious challenges in the effort to achieve food security, both at the national and global levels. This condition directly contradicts Sustainable Development Goal number 2, which aims to end hunger and achieve sustainable food security.[11] In Indonesia, the trend of rice field conversion shows a concerning decrease in area. Ironically, most of these land transformation processes do not consider the principles of environmental, social, and economic sustainability. If left unchecked without strict regulations and a long-term vision, land conversion can deepen food access inequality and accelerate the degradation of agrarian ecosystems.[12] Indonesia has acknowledged the issue of agricultural land conversion into built-up areas. Law No. 41 of 2009 on the Protection of Sustainable Agricultural Land reflects this awareness. However, despite regulatory measures, the conversion of significant agricultural land into developed areas persists. Evidence indicates that Indonesia witnessed a reduction of nearly 650 thousand hectares of rice fields in one year, from 7.75 million hectares in 2017 to 7.1 million hectares in 2018. In response to this concerning trend, the President of the Republic of Indonesia issued Presidential Regulation Number 59 of 2019 on the Control of Rice Field Conversion.

With the enactment of Presidential Regulation Number 59 of 2019, it is hoped that the conversion rate of productive land to non-productive land can be slowed down with the aim of maintaining food security. In addition, the main objective of the regulation is to expedite the establishment of protected rice field maps in order to meet and maintain the availability of rice fields to support national food needs. And the final result of Presidential Regulation Number 59 of 2019 is the formation of Regional Regulations on Spatial Planning, which will certainly update the Detailed Spatial Planning in Districts/Cities. The rules about Protected Rice Fields can officially start once the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency issues a decree, specifically Number 1589/SK-HK.02.02/XII/2021, which sets up the Protected Rice Field Map in eight provinces, including Java, and aims to cover all other provinces by 2023. The formation of the protected

[9] Mira Kelly-Fair and others, 'Analysis of Land Use and Land Cover Changes through the Lens of SDGs in Semarang, Indonesia', *Sustainability*, 14.13 (2022), 7592 <https://doi.org/10.3390/su14137592>.
[10] Hossein Azadi, Fatemeh Taheri, and others, 'Impact of Agricultural Land Conversion on Climate Change', *Environment, Development and Sustainability*, 23.3 (2021), 3187–98 <https://doi.org/10.1007/s10668-020-00712-2>.
[11] Viana and others.
[12] Laju Gandharum and others, 'Past and Future Land Use Change Dynamics: Assessing the Impact of Urban Development on Agricultural Land in the Pantura Jabar Region, Indonesia', *Environmental Monitoring and Assessment*, 196.7 (2024), 645 <https://doi.org/10.1007/s10661-024-12819-4>.

rice field map begins with the verification of the basic rice field using satellite imagery, spatial and land data, irrigation data, rice field print data, and forest area data. As mentioned in Article 9, Paragraph (1) of Presidential Regulation Number 59 of 2019.[13] However, the next issue arises, including discrepancies between the designated location and the spatial plan, the existence of buildings, existing permits or concessions, and database errors.[14]

This is also happening in Vietnam. Vietnam has become one of the fastest-growing economies in Asia in recent decades, and the agricultural sector still plays an important role in its economic development. Although Vietnam has become one of the fastest-growing economies in Asia in recent decades, the agricultural sector still plays an important role in its economic development. In terms of rice production in Vietnam, approximately 7.24 million hectares were estimated to be rice paddies in 2021, which is about 38.3 thousand hectares lower than the previous year. The rice yield is estimated to reach 60.6 quintals per hectare in 2021, which is an increase of 1.8 quintals per hectare compared to the rice yield in 2020. A total of 6.2 million tons of rice were exported in 2021, equivalent to 3.3 billion USD, an increase of 5% from 2020, and the export price of rice rose from 496 USD per ton in 2020 to 503 USD per ton in 2021. Rice is a staple food and a primary source of income for farmers in Vietnam, and thus sustainable rice production is crucial for national food security.[15]

The phenomenon of agricultural land reduction due to land conversion also poses a significant threat to food security in Vietnam. This phenomenon stems from many reasons, and industrialization is one of them. To carry out the process of industrialization, land conversion is the tool used in most countries to change land use from agricultural to non-agricultural.[16] It is estimated that around 10 million hectares of land (agricultural and forest land) in Vietnam have been acquired and converted to support the national industrialization and urbanization strategy. Additionally, recently, many farmers have left agricultural work in rural areas to seek non-agricultural jobs in cities, resulting in wasted agricultural land resources. This situation could be more serious in communities affected by ALAFU, where almost all farmers have lost part of their agricultural land and have more opportunities to take non-agricultural jobs. Like in many developing countries such as China, India, and Indonesia, the Vietnamese economy is evolving with various types of jobs. Agriculture is not only an important sector in this country, but it also plays a significant role in maintaining food security, food safety, and protecting the environment in both rural and urban areas. Therefore, the nation's sustainable economic development strategy also mentions promoting urbanization, developing sustainable agriculture, and protecting agricultural land resources.[17]

Several scholars have conducted research related to land use conversion. Research by Hossein Azadi (2021) shows that the impact of land-use conversion is almost unrecognized as a major driver of climate change.[18] Furthermore, research by Eda Ustaoglu (2022) shows that reducing the area of agricultural land taken for urban development, or eliminating such conversions, is a priority of international policy aimed at preserving the quantity and quality

[13] Arvita Fajar Sholecha and Rahayu Subekti, 'Implementation of Protected Paddy Land Control in Indonesia', *International Journal of Law*, 10.2 (2024), 1–8 <https://www.lawjournals.org/assets/archives/2024/vol10issue2/10054.pdf>.
[14] Gandharum and others.
[15] Nguyen Thai Phan, Ji-Yong Lee and Nguyen Duc Kien, 'The Impact of Land Fragmentation in Rice Production on Household Food Insecurity in Vietnam', *Sustainability*, 14.18 (2022), 11162 <https://doi.org/10.3390/su141811162>.
[16] Nguyen Tran Tuan, 'Shrinking Agricultural Land and Changing Livelihoods after Land Acquisition in Vietnam', *Bulletin of Geography. Socio-Economic Series*, 53.53 (2021), 17–32 <https://doi.org/10.2478/bog-2021-0020>.
[17] Nhung Pham Thi, Martin Kappas and Heiko Faust, 'Impacts of Agricultural Land Acquisition for Urbanization on Agricultural Activities of Affected Households: A Case Study in Huong Thuy Town, Thua Thien Hue Province, Vietnam', *Sustainability*, 13.15 (2021), 8559 <https://doi.org/10.3390/su13158559>.
[18] Azadi, Taheri, and others.

of land resources currently available for food production and sustainable development.[19] Another study by S.V.R.K. Prabhakar (2021) shows that policy measures to address unsustainable land transformation are very minimal, and countries have not succeeded in capturing the negative trend.[20] Furthermore, research by Hossein Azadi (2022) shows that unsustainable land use has contributed to increased vulnerability to disasters. Disasters and land use changes have become major concerns worldwide.[21] Research conducted by Dawei Hou (2021) shows that urbanization impacts the conversion of agricultural land in newly settled areas and the neglect of agricultural land in abandoned areas.[22]

Based on various previous studies, it has been revealed that land use change has become a crucial issue that continues to evolve along with the dynamics of development and population pressure. However, the complex interaction between humans and land, especially in the context of converting agricultural land into non-agricultural areas, has not been fully understood or thoroughly resolved through existing policy approaches. This indicates a gap in spatial governance and land institutional frameworks, which ultimately directly impacts the sustainability of the food system. Therefore, a more in-depth and comparative study is needed that not only maps its ecological impacts but also evaluates the policy responses implemented in various countries. This article aims to analyze the impact of the conversion of agricultural land to food production on sustainable food security in Indonesia and Vietnam, two agrarian countries in Southeast Asia that are currently facing significant pressures from urbanization and land use changes. By highlighting policy dynamics, adaptation strategies, and socio-economic-ecological implications, this article is expected to contribute to the formulation of more effective and sustainable models for land protection in the region.

Method

This research uses normative legal research with an emphasis on the analysis of legislation related to the conversion of agricultural land in Indonesia and Vietnam. This study also uses a conceptual approach to look at important legal principles and applies legal system theory to find out why there are inconsistencies between land conversion rules and sustainability principles in spatial planning. The data used in this research includes both primary and secondary sources, which were obtained through a literature review of legal documents, policy archives, scientific literature, and previous research findings that have been validated.[23] The applied analysis techniques are systematic and prescriptive, where systematic analysis is used to dissect relevant legal components in a structured manner, while prescriptive analysis is aimed at formulating policy improvement recommendations. This methodological approach is designed to strengthen the validity of the findings and provide a solid foundation for formulating conclusions that align with sustainable development goals and environmental preservation.

[19] Eda Ustaoglu and Brendan Williams, 'Institutional Settings and Effects on Agricultural Land Conversion: A Global and Spatial Analysis of European Regions', *Land*, 12.1 (2022), 47 <https://doi.org/10.3390/land12010047>.

[20] Prabhakar.

[21] Hossein Azadi, Ali Akbar Barati, and others, 'Climate-Related Disasters and Agricultural Land Conversion: Towards Prevention Policies', *Climate and Development*, 14.9 (2022), 814–28 <https://doi.org/10.1080/17565529.2021.2008291>.

[22] Dawei Hou, Fanhao Meng and Alexander V. Prishchepov, 'How Is Urbanization Shaping Agricultural Land-Use? Unraveling the Nexus between Farmland Abandonment and Urbanization in China', *Landscape and Urban Planning*, 214 (2021), 104170 <https://doi.org/10.1016/j.landurbplan.2021.104170>.

[23] Ni Komang Sutrisni and others, 'The Compliance of Governance on Family Data Protection Regulation', *Journal of Human Rights, Culture and Legal System*, 4.3 (2024), 706–41 <https://doi.org/https://doi.org/10.53955/jhcls.v4i3.293>.

Results and Discussions

Patterns and Driving Factors of Agricultural Land Conversion in Indonesia

Indonesia is a tropical country with the highest CO2 emissions in the world from land-use change processes. The expansion of agriculture has played an important role in the management of intensive land use across Indonesia over the past few decades. Actors play a special role because they are responsible for, and play an important role in, the driving forces of land change. Actors make decisions, act accordingly, and influence other actors and the environment with their actions. The various causes driving land change in the area reflect global trends and regional peculiarities, depending on social and ecological conditions; however, understanding the drivers of land change has its challenges.[24] Moreover, the conversion of agricultural land is an inevitable part of modernization and is often viewed as a significant issue contributing to unbalanced urban and regional development. Long-term negative impacts can affect food supply, disasters, and land fragmentation when these conditions persist.[25]

The land conversion remains uncontrolled, it will pose the greatest threat to achieving sustainable food security by 2045. The production capacity of rice fields will continue to decline if the conversion of rice fields cannot be controlled and there are no efforts to protect productive rice fields, especially on the island of Java and other major cities that have extensive rice fields. If the conversion of rice fields continues at the rate of 90,000 hectares per year, there will be 5.2 million hectares of rice fields remaining. If the per capita consumption pattern remains at 110 kg per year, then by 2045, an additional food requirement of 25.9 million tons will be needed to meet the MDG. Although there has been an increase in productivity and planting index for all types of rice fields, the national food requirement is still less than 3.97 million tons of GKG in 2045. Therefore, strong policy support and commitment from various parties, especially the central and regional governments, are needed to set priorities, particularly in fulfilling national strategic programs without sacrificing rice fields to maintain food security.[26]

The phenomenon of agricultural land conversion in Indonesia is a complex issue with widespread impacts on national food security. There are several factors that cause this rampant and unsustainable landuse change. *First*, structurally, the legal institutions in Indonesia still face various challenges in terms of coordination and supervision. Many local governments have not fully implemented Law No. 41 of 2009 on the Protection of Sustainable Food Agricultural Land effectively, resulting in land conversion still occurring without adequate supervision.[27] *Second,* from a substantive perspective, although there are regulations that explicitly prohibit land conversion without permission, there are still legal loopholes and weak sanctions imposed on violators. The problem is exacerbated by the lack of synchronization in regulations between the central and regional levels, as well as the conflict of interest between agricultural preservation and the economic development needs such as housing and industry. Furthermore, the structural economic changes that promote

[24] Lila Juniyanti and others, 'Understanding the Driving Forces and Actors of Land Change Due to Forestry and Agricultural Practices in Sumatra and Kalimantan: A Systematic Review', *Land*, 10.5 (2021), 463 <https://doi.org/10.3390/land10050463>.

[25] Setyardi Pratika Mulya and others, 'Spatio-Temporal Changes in Agricultural Land and Rural–Urban Transitions in Greater Jakarta, Indonesia', *Regional Environmental Change*, 24.4 (2024), 145 <https://doi.org/10.1007/s10113-024-02306-4>.

[26] Soediro Soediro, Mahdi Muhammad and Kem Nori Alfath, 'The Role of Public Participation in Agricultural Land Conversion to Achieve National Food Security', *Jurnal Dinamika Hukum*, 24.3 (2024), 314 <https://doi.org/10.20884/1.jdh.2024.24.3.15563>.

[27] M. Nasruddin Adha, M. Hadin Muhjad and Achmad Faishal, 'As a Result of Legal Transfer of Function of Sustainable Food Agricultural Land to Non-Agriculture', *International Journal of Social Science and Human Research*, 06.07 (2023) <https://doi.org/10.47191/ijsshr/v6-i7-56>.

the growth of the non-agricultural sector make agricultural land an economically enticing speculative commodity.[28]

Third, from the perspective of legal culture, there is a tendency among the community, including farmers, to sell their land for short-term economic gains, considering the low-income levels in the agricultural sector. In fact, in some cases, land conversion is considered a form of economic rationalization for farming families amidst limited access to capital and agricultural technology. Cultural values regarding land as an agrarian heritage are beginning to be overshadowed by pragmatic views related to the market value of land. The low legal awareness and lack of education about the importance of agricultural land for food security pose significant obstacles in building a legal culture that supports land protection.[29] Therefore, changing agricultural land is not just a technical or administrative matter but a widespread issue that includes problems with how institutions are set up, weaknesses in laws, and a lack of legal understanding in society. Solutions to this problem require a holistic approach, including strengthening regulations, synergy between institutions, and legal education for the community about the importance of maintaining agricultural land sustainability for national food sovereignty.

Patterns and Driving Factors of Agricultural Land Conversion in Vietnam

Vietnam is one of the world's rice-producing and exporting countries and the largest in Southeast Asia. In 2020, Vietnam ranked third after India and Thailand as the world's rice-exporting countries. The volume of rice exports from Vietnam from the beginning of the year to the present has reached 4.5 million tons with a value of 2.2 billion USD (approximately IDR 32.2 trillion). Compared to the same period last year, the export volume decreased by about 1.7%. However, its value increased by 10.4%. However, In urban areas, the trend of land use change involves a reduction in agricultural and idle land, along with an increase in non-agricultural land. Urban land expansion, industrial zone expansion, and construction activities primarily drive the growth of non-agricultural land area. The area of urban land has increased due to the conversion of agricultural land, most of which is rice paddy fields. Based on data from MoNRE, Vietnam converted 89.4 thousand hectares of rice fields into urban land in the years 2011–2015. From a broader perspective, we estimate that the converted land area reached 125.9 thousand hectares between 2007 and 2017. This transition is primarily concentrated in three regions: Southeast, Red River Delta, and Mekong River Delta.[30]

The conversion of agricultural land for investment in urban, industrial, and economic projects is occurring in major urban areas such as Binh Duong, Ho Chi Minh City, Hai Phong, and Hanoi. The activity of repurposing land has made a positive contribution to socio-economic development. The development of industrial and economic zones has attracted domestic and foreign investments, including major and leading companies from around the world. Therefore, the industrial and economic zones contribute to synchronizing and modernizing urban and rural infrastructure systems. However, many of the industrial zones created by these projects have negatively impacted the environment by fragmenting agricultural land. These projects also lead to the abandonment of agricultural land and land eviction. The numerous "delayed planning" projects have led to the depletion of natural resources. Until 2019, Vietnam had around 11 million hectares of abandoned and degraded land. This has led to a decrease in agricultural land, thereby reducing productivity and impacting village development.[31]

[28] Imade Y. Prasada and Agus D. Nugroho, 'Determinant Factors of the Agricultural Land Sustainability in Indonesia', 2022 <https://doi.org/10.2991/absr.k.220305.043>.
[29] Della Ayu Anandita and Kinanti Zukhrufijannah Patria, 'Agriculture Challenges: Decline of Farmers and Farmland (Study from Indonesian Family Life Survey)', *Jurnal Ilmu Ekonomi Dan Pembangunan*, 16.1 (2017) <https://doi.org/10.20961/jiep.v16i1.2314>.
[30] Nguyen Tran Tuan, 'Urbanization and Land Use Change: A Study in Vietnam', *Environmental and Socio-Economic Studies*, 10.2 (2022), 19–29 <https://doi.org/10.2478/environ-2022-0008>.
[31] Tuan.

There are several factors that support the rate of land-use change in Vietnam. *First*, the legal structure factor: public land management at the district level, such as in Gia Lam, Hanoi, still faces challenges in administrative coordination, weak supervision, and land fragmentation that complicates the control of land-use change. The effectiveness of land management is greatly influenced by policy factors (38.06%), financial factors (36.17%), and managerial capacity (25.77%), reflecting an imbalance in policy implementation institutions.[32] *Second,* regarding legal factors, even though Vietnam has put in place important laws like the Land Law 1988 and the Land Law 1993 that set rules for land distribution and ownership limits, these laws have not stopped elite groups from concentrating land and have led to a growing gap in land ownership between farming and non-farming households. Changes in land use are not always accompanied by regulatory adaptations that are responsive to market dynamics and ecological pressures, such as seawater intrusion due to climate change. *Third*, the factor of legal culture: the legal culture of Vietnamese society also plays an important role. In some areas like Nga Nam, land use changes occur due to economic pressures and farmers' desire to increase productivity or switch to more economically profitable commodities. Factors such as saltwater intrusion, consumer markets, and agricultural profit levels are the main drivers of these changes.[33] This reflects a more pragmatic and economic cultural preference compared to the conservative view of land as an agrarian heritage that must be preserved.

The Impact of Agricultural Land Conversion on Food Security: Social, Ecological, and Economic Perspectives

The conversion of agricultural land to non-agricultural use has now become a strategic issue that raises widespread concern, especially due to its detrimental impact on national and global food security systems.[34] This change not only reduces the area of land available for food production but also decreases the labor capacity in the agricultural sector, expands the conversion of rain-fed and dryland areas into built-up areas, and triggers significant changes in the social, cultural, and livelihood structures of rural communities.[35] This phenomenon goes beyond mere physical or spatial issues related to land use; it is a complex symptom closely linked to the interrelated social, ecological, and economic dynamics. In the context of food security, the existence and sustainability of agricultural land play a crucial role in ensuring the four main pillars, namely availability, accessibility, safe and nutritious utilization, and the stability of food supply over time. When fertile lands that were previously used for growing staple foods are converted into industrial areas, residential zones, or infrastructure without adequate planning and control, the main foundation of the food system becomes vulnerable. This impact disrupts the local food supply chain and increases the risk of dependence on imported food, which in the long term can weaken a country's food sovereignty. Understanding the impact of land use changes on agricultural land can help manage it sustainably.[36]

First, from a social perspective, land conversion directly impacts the lives and welfare of farmers. Changes in land use often led to the relocation of residents, loss of arable land, and reduced access to natural resources that previously supported the lives of agrarian communities. The disparity in land ownership structure has also become sharper, especially when the conversion process is carried out through non-transparent mechanisms that favor

[32] Pham Phuong Nam, Phan Thi Thanh Huyen and Pham Van Ha, 'Factors Affecting the Management of Public Agricultural Land Fund in Gia Lam District, Hanoi City, Vietnam', *Land Use Policy*, 101 (2021), 105151 <https://doi.org/10.1016/j.landusepol.2020.105151>.

[33] Phan Chi Nguyen and others, 'Saltwater Intrusion and Agricultural Land Use Change in Nga Nam, Soc Trang, Vietnam', *Resources*, 13.2 (2024), 18 <https://doi.org/10.3390/resources13020018>.

[34] A Ranjithkumar, 'Assessing the Impact of Agricultural Land Reduction on Future Global Food Security : Challenges and Sustainable Solutions', *Indian Journal of Natural Sciences*, 15.88 (2025), 89066–83.

[35] Zhihui Zhang and others, 'Socio-Economic Impacts of Agricultural Land Conversion: A Meta-Analysis', *Land Use Policy*, 132 (2023), 106831 <https://doi.org/10.1016/j.landusepol.2023.106831>.

[36] Prabhakar.

large investors. When agricultural land is handed over to corporations or foreign investors, the local community loses its land rights, and access to local food is disrupted because the production is more aimed at export rather than domestic needs. Land conversion also alters the rural social structure, with many farmers switching professions to become non-agricultural laborers and the younger generation becoming increasingly reluctant to enter the agricultural sector due to uncertainty in access and livelihood.[37]

Second, from an ecological perspective, land conversion has a very complex environmental impact and, often, a detrimental one.[38] The process of converting agricultural land into built-up areas, whether for housing, industry, or infrastructure, results in serious ecosystem disturbances.[39] The disruption or destruction of the natural habitats of various flora and fauna species leads to the loss of biodiversity, which is one of the main consequences. Additionally, the change in land cover from permeable agricultural vegetation to impermeable surfaces like concrete and asphalt drastically reduces the soil's ability to absorb rainwater.[40] This contributes to an increase in surface runoff events, which in turn heightens the risk of floods, landslides, and erosion.[41] Furthermore, soil quality degradation poses another serious threat. Often, land conversion leads to soil and water contamination by industrial pollutants or domestic waste. Meanwhile, the remaining agricultural land tends to experience intensified use to compensate for the reduction in productive land area. This increased use usually means adding more chemicals like synthetic fertilizers and pesticides, which, if used too much and without good management, can harm soil health, pollute groundwater and surface water, and upset the balance of soil microorganisms. In the long term, such use damages the integrity of agricultural ecosystems and threatens the land's ability to support sustainable food production.[42]

However, it is important to note that not all forms of land use change or transfer have a negative impact on ecology. In the context of well-structured land policy and management, the transformation of land functions can be directed to support environmental sustainability. For example, research conducted by Xu et al. (2023) revealed that a land rights transfer system supporting large-scale management and the use of efficient agricultural mechanization technology can significantly reduce the intensity of fertilizer and pesticide use. With this approach, production efficiency increases and environmental impact can be minimized.[43] Unfortunately, such management practices are still exceptions and have not yet become the norm, especially in developing countries. The limited capacity of institutions, the weak spatial planning system, and the lack of incentives for adopting environmentally friendly technologies are the main obstacles in promoting the transition to sustainable

[37] Boutchouang Nghomsi Chanceline, 'Land Grabbing And Its Impact On Food Security In Sub-Saharan Africa', *SocioEconomic Challenges*, 3.4 (2019), 72–85 <https://doi.org/10.21272/sec.3(4).72-85.2019>.
[38] Qing Hu, Heping Huang and Chih-Chun Kung, 'Ecological Impact Assessment of Land Use in Eco-Industrial Park Based on Life Cycle Assessment: A Case Study of Nanchang High-Tech Development Zone in China', *Journal of Cleaner Production*, 300 (2021), 126816 <https://doi.org/10.1016/j.jclepro.2021.126816>.
[39] Meng Yu and others, 'Urbanization, Land Conversion, and Arable Land in Chinese Cities: The Ripple Effects of High-Speed Rail', *Applied Geography*, 146 (2022), 102756 <https://doi.org/10.1016/j.apgeog.2022.102756>.
[40] Christelle Gramaglia and others, 'Reducing the Imperviousness of Urban Soils to Enhance the Quality of Surface Water: Obstacles and Levers to Implementing Ecological Runoff Management in the South of France', *Journal of Hydrology*, 636 (2024), 131168 <https://doi.org/10.1016/j.jhydrol.2024.131168>.
[41] Felicitas U. Iwuchukwu and others, 'A Consideration of the Climatic Drivers, Focal Points and Challenges of Soil Erosion, Land Degradation, Landslides and Landscapes in Nigeria', 2023, pp. 449–77 <https://doi.org/10.1007/978-3-031-21007-5_23>.
[42] Xiao Lyu and others, 'Evaluation of Sustainable Intensification of Cultivated Land Use According to Farming Households' Livelihood Types', *Ecological Indicators*, 138 (2022), 108848 <https://doi.org/10.1016/j.ecolind.2022.108848>.
[43] Hui Xu and others, 'Exploring the Ecological Protection Impacts of Cultivated Land Transfer: Explanation Based on Fertilizers and Pesticides', *Ecological Indicators*, 154 (2023), 110681 <https://doi.org/10.1016/j.ecolind.2023.110681>.

agriculture.[44] Therefore, progressive and participatory policy interventions are needed to strengthen the environmental regulatory framework and support farmers in adopting more ecological and efficient practices. Improper land use changes not only endanger the local environment but also contribute to macro-scale environmental crises such as climate change and global ecosystem resilience.[45]

Third, from an economic perspective, the driving force behind land use change is generally economic.[46] Land use conversion brings ambivalent impacts and creates quite complex dynamics in the agrarian and food systems. On one hand, the process of land conversion is often considered an opportunity for farmers to gain short-term economic benefits. When the land value increases due to development and urbanization pressures, many farmers are tempted to sell their land for instant financial gains, which are far greater than the yields obtained through traditional farming activities.[47] Moreover, the economic incentives offered by the non-agricultural sector, such as real estate, industry, or tourism, are often much more promising compared to agricultural yields, especially in conditions of uncertain crop prices and high production costs. This phenomenon not only drives the direct conversion of land to the non-agricultural sector but also encourages changes in agricultural cultivation patterns. Many farmers who still maintain their agricultural land then choose to switch to high-value crops or cash crops, such as horticulture, plantation crops, or industrial crops. Although these crops can generate higher income per unit of land, they are generally not staple foods, so this shift threatens the balance of local food supply.

A study by Leng et al. (2021) shows that land tenure transfer results in significant changes in crop structure, from staple food crops like rice and wheat to non-food crops that are more economically profitable but do not support national food security.[48] The implications of this dynamic are very far-reaching. When local food production declines due to the reduction of land and shifts in commodity types, dependence on food supplies from other regions or imports from abroad increases.[49] This dependence brings systemic risks to food security, especially in the context of global supply chain disruptions, price volatility, or geopolitical crises. In addition, the spatial imbalance between food production and consumption centers also increases distribution costs, amplifies the potential for logistical waste, and creates price disparities between regions. Therefore, although land conversion can increase individual income in the short term, it has the potential to weaken agricultural economic independence and undermine the foundation of the long-term food system if not managed strategically and sustainably.[50]

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[44] Abdul Rehman and Muhammad Farooq, 'Challenges, Constraints, and Opportunities in Sustainable Agriculture and Environment', in *Sustainable Agriculture and the Environment* (Elsevier, 2023), pp. 487–501 <https://doi.org/10.1016/B978-0-323-90500-8.00012-9>.

[45] Massimo Lupascu and others, 'Climate-Smart Peatland Management and the Potential for Synergies between Food Security and Climate Change Objectives in Indonesia', *Global Environmental Change*, 82 (2023), 102731 <https://doi.org/10.1016/j.gloenvcha.2023.102731>.

[46] Gunawan Prayitno and others, 'Place Attachment and Agricultural Land Conversion for Sustainable Agriculture in Indonesia', *Heliyon*, 7.7 (2021), e07546 <https://doi.org/10.1016/j.heliyon.2021.e07546>.

[47] Fentaw Baye, 'Informal Land Market Mechanisms for Accessing and Securing Land for Housing Development: The Case of Peri-Urban Areas of Woldia Township, Ethiopia', *Cogent Social Sciences*, 11.1 (2025) <https://doi.org/10.1080/23311886.2025.2482115>.

[48] Zhihua Leng, Yana Wang and Xinshuo Hou, 'Structural and Efficiency Effects of Land Transfers on Food Planting: A Comparative Perspective on North and South of China', *Sustainability*, 13.6 (2021), 3327 <https://doi.org/10.3390/su13063327>.

[49] Tarek Ben Hassen and Hamid El Bilali, 'Impacts of the Russia-Ukraine War on Global Food Security: Towards More Sustainable and Resilient Food Systems?', *Foods*, 11.15 (2022), 2301 <https://doi.org/10.3390/foods11152301>.

[50] Shulang Fei and others, 'Technological Innovations in Urban and Peri-Urban Agriculture: Pathways to Sustainable Food Systems in Metropolises', *Horticulturae*, 11.2 (2025), 212 <https://doi.org/10.3390/horticulturae11020212>.

Moreover, the spatial imbalance between food production locations and rapidly growing consumption centers adds pressure to the food distribution system. A study by Liao et al. (2024) shows that large-scale land conversion has led to a decrease in food production potential to levels that can sustain millions of people each year.[51] When the centers of population and economic growth move away from food production centers, a spatial mismatch phenomenon occurs that not only increases logistics costs but also reduces the efficiency of the national food system. Overall, land use conversion is a structural challenge to food security that must be addressed with a cross-sectoral and evidence-based approach.[52] The government needs to formulate policies for sustainable agricultural land protection based on spatial zoning, strengthen incentives for farmers to remain in the agricultural sector, and encourage investment in environmentally friendly and market-oriented agriculture. Interventions such as land compensation mechanisms, subsidies for sustainable agricultural practices, and stricter land use monitoring systems are crucial to ensure that economic development and urbanization do not sacrifice the future of food security.

Reconstruction of Sustainable Agricultural Land Conversion Policy

In facing the issue of uncontrolled agricultural land conversion that disregards sustainability principles, Indonesia requires a reconstruction of regulations that is not only normative but also substantive and implementable. This reconstruction must be designed to ensure a balance between development needs and the protection of productive land to guarantee the sustainability of the local food system, environmental resilience, and social justice for the community. Without a comprehensive policy reformulation, the process of agricultural land conversion will continue sporadically, causing conflicts of interest and weakening the region's resilience to food and ecological crises. Therefore, a new approach that places the protection of agricultural land as part of a sustainable development strategy is necessary, not only through the revision of regional regulations but also through strengthening institutions, community participation, and the integration of accurate and responsive spatial data to field dynamics.

Reconstruction comes from the word "construction." Construction is the arrangement of a building or the arrangement and relationship of words in a sentence or group of words. Another meaning of construction can also be interpreted as the arrangement and relationship of building materials in such a way that the assembly becomes a unity that can bear loads and become strong. According to the scientific dictionary, reconstruction is the rearrangement; demonstration (repeated example) (according to previous behavior/action); repetition (as it was originally). Thus, in this case, it can be concluded that reconstruction is a reformation or reorganization to restore the actual situation that was initially incorrect to become correct. The reconstruction carried out aims to ensure that regulations in agricultural land control can function well, aligning what is desired (das Sollen) with what is (das Sein). Legal reconstruction is a step to refine existing legal rules by responding to societal changes. In addition, it is also one way to develop legal materials or positive law through logical reasoning so that the desired results can be achieved. In other words, reconstruction is an effort to reorganize and synchronize several existing legal rules.

Next, in addressing the issue of uncontrolled agricultural land conversion that disregards sustainability principles, Indonesia requires a regulatory reconstruction that is not only normative but also substantive and implementable. This reconstruction must be designed to ensure a balance between development needs and the protection of productive land to guarantee the sustainability of local food systems, environmental resilience, and social justice

[51] Yixin Liao and others, 'Integrated Assessment of the Impact of Cropland Use Transition on Food Production Towards the Sustainable Development of Social–Ecological Systems', *Agronomy*, 14.12 (2024), 2851 <https://doi.org/10.3390/agronomy14122851>.

[52] Anne Marie Thow, 'Enhancing Global Support to Address Complex Sustainable Development Policy Challenges: Learning from Success in Cross-sectoral Nutrition Policy', *Sustainable Development*, 33.2 (2025), 1835–47 <https://doi.org/10.1002/sd.3191>.

for the community. Without a comprehensive policy reformulation, the process of agricultural land conversion will continue sporadically, causing conflicts of interest and weakening the region's resilience to food and ecological crises. Therefore, a new approach that places the protection of agricultural land as part of a sustainable development strategy is absolutely necessary, not only through the revision of regional regulations but also through strengthening institutions, community participation, and the integration of accurate and responsive spatial data to field dynamics.[53]

First, harmonization of central and regional regulations. One of the main prerequisites in the effort to reconstruct sustainable agricultural land use conversion regulations is the harmonization between central regulations and regional regulations.[54] The lack of synchronization between regulations often becomes the main trigger for policy dysfunction, where the direction of regional development contradicts the resource protection strategies established by the central government. The inconsistency impacts the clarity of land status in spatial planning policies, thereby creating gaps for unauthorized land use changes, both administratively and substantively. In practice, local governments tend to prioritize short-term economic interests through land investments and the development of new areas rather than referring to the LSD data set by the central government. This results in a decrease in the effectiveness of agricultural land protection policies and causes confusion in the verification and validation process of land use by the National Land Agency (BPN). To address these issues, regulatory harmonization must be pursued through adjustments to the substance of regional regulations to align with national legal norms, particularly those concerning indicative LSD maps, agricultural zone zoning, and mechanisms for controlling land use conversion. Additionally, a regular coordination forum between the central and regional governments is needed to discuss the revision or update of spatial and agricultural data in a participatory and evidence-based manner. With this harmonization, the implementation of land use conversion policies can proceed consistently, measurably, and in accordance with legal principles that ensure sustainability and spatial justice.

Second, strengthening institutional frameworks and oversight mechanisms. One of the main root causes of the uncontrolled conversion of agricultural land is the weakness of institutions and the lack of effective and integrated oversight mechanisms.[55] So far, the roles of each agency often operate independently, without solid coordination and a consistent monitoring system. To address this issue, it is necessary to establish a cross-sectoral coordinating body involving the National Land Agency, the Agriculture Office, the Regional Development Planning Agency (Bappeda), and environmental agencies at the regional level. This institution not only functions as a coordination forum but also as a cross-data controller and a strategic decision-maker regarding land use. The main function of this institution must include periodic verification and validation of land use, which relies on administrative documents and uses spatial data based on Geographic Information System (GIS) technology. This technology enables real-time tracking of land use changes, making early detection of space usage violations easier. Furthermore, supervision should not be purely internal and bureaucratic. A participatory oversight model needs to be developed, which opens up space for civil society, academics, and farmer groups to participate in monitoring

[53] Nevena Ćurčić and others, 'The Role of Rural Tourism in Strengthening the Sustainability of Rural Areas: The Case of Zlakusa Village', *Sustainability*, 13.12 (2021), 6747 <https://doi.org/10.3390/su13126747>.

[54] Riezky Ruskandi Natadireja, Sinta Ningrum and Ramadhan Pancasilawan, 'Dynamics Of Indonesian Agricultural Policy From 1945-2022', *Eduvest - Journal of Universal Studies*, 4.7 (2024), 5642–64 <https://doi.org/10.59188/eduvest.v4i7.1539>.

[55] Hossein Azadi, Stefan Burkart, and others, 'Famine in the Horn of Africa: Understanding Institutional Arrangements in Land Tenure Systems', *Food Reviews International*, 38.sup1 (2022), 829–45 <https://doi.org/10.1080/87559129.2021.1888974>.

the implementation of policies for converting land use.[56] Public involvement will increase accountability and reduce the potential for land function manipulation that has often occurred in the process of legalizing the conversion of agricultural land into development areas. By improving institutions and ensuring clear oversight, the system for protecting agricultural land will have a fair, clear, and flexible way to prevent land use changes that go against sustainability and fairness in land use.

Third, affirmation of the social function of land in spatial planning. In the context of sustainable development, the social function of land is a fundamental principle that must be the main foundation in every spatial planning policy. Article 6 of the Basic Agrarian Law (UUPA) No. 5 of 1960 explicitly states that every land right must contain a social function, meaning that land use is not only private or individual but must also consider the interests of the wider community, ecological sustainability, and environmental preservation.[57] Therefore, the reconstruction of land use change regulations, both at the national level and beyond, must reaffirm this principle in planning documents and spatial regulation. The right to land owned by individuals or legal entities cannot be used absolutely, especially if its management neglects the sustainability of agrarian functions or disrupts the ecological balance of the region. Land conversion, especially from agriculture to non-agriculture, should not be a routine and repetitive process but rather regarded as an extraordinary measure that is only undertaken when all alternative land uses have been comprehensively evaluated and proven insufficient.

A similar issue also occurs in Vietnam, where the system of collective land ownership by the state has not yet guaranteed substantial protection of farmers' rights. The process of land conversion, especially for urbanization and industrial zone projects, is still carried out in a top-down manner, with minimal public participation and often resulting in the eviction or relocation of farmers without adequate compensation mechanisms. This was revealed by Tuan (2022), who stated that without legal reform and spatial planning transparency, the social function of land in Vietnam will continue to be undermined by non-inclusive economic growth.[58] Therefore, the application of the social function of land must also be explicitly included in regional spatial planning documents such as RTRW and RDTR so that it does not remain an abstract norm but can truly be operationalized. Local governments need to establish sustainable agricultural land protection zones as strategic areas that cannot be converted without in-depth studies and adequate public participation. The mechanism for overseeing the implementation of this social function must also be strengthened through independent and transparent supervisory bodies in order to prevent land speculation practices and the misuse of land-use conversion permits. By restoring the role of land as a tool for fulfilling basic needs, ecological security, and binding the social structure of society, land and spatial planning policies will be more aligned with the principles of spatial justice, food sovereignty, and environmental sustainability. The affirmation of the social function of land not only serves as a moral and legal foundation in spatial governance but also as a strategic instrument to balance economic growth with the protection of community rights to a decent and sustainable living space.

Fourth, ensuring public participation and transparency is crucial. To realize a fair and sustainable agricultural land conversion management system, public participation and policy

[56] Herry Purnomo and others, 'Community-Based Fire Prevention and Peatland Restoration in Indonesia: A Participatory Action Research Approach', *Environmental Development*, 50 (2024), 100971 <https://doi.org/10.1016/j.envdev.2024.100971>.

[57] Puput Cindy Novianty, Soemarno and Anthon Efani, 'Analyzing Land Conversion Rate and Conversion Farmer Household Food Security in Bakalan Village, Pasuruan Regency', *Jurnal Penelitian Pendidikan IPA*, 11.1 (2025), 415–24 <https://doi.org/10.29303/jppipa.v11i1.7583>.

[58] Tuan.

transparency become fundamental principles that cannot be overlooked.[59] In Indonesia and Vietnam, two agrarian countries with high urbanization pressures, strengthening these two pillars has proven to be a key factor in maintaining sustainable land use and preventing agrarian conflicts. Recent studies in Indonesia show that the minimal involvement of the community in the planning and decision-making processes, such as in the revision of the Regional Spatial Plan (RTRW) or the designation of Sustainable Food Agricultural Land (LP2B), has worsened the phenomenon of illegal or covert land conversion.[60] Meaningful participation is not just about symbolic consultation but the active involvement of farmers, local communities, and vulnerable groups from the planning stage to policy evaluation. One example of positive implementation is the development of urban farming in Makassar, where the involvement of women's farmer groups (KWT) and local community institutions in planning green spaces and urban agriculture has been able to create social legitimacy and program effectiveness. However, public participation is still structurally weak, partly due to low legal literacy among the community and limited access to spatial land use data.

On the other hand, Vietnam is still struggling to improve transparency in land conversion policies, especially in the process of land acquisition for public interest and private investment. Cases of farmer relocations and disparities in land compensation often occur due to the opaque process and the lack of effective grievance mechanisms.[61] The Vietnamese government is currently revising the Land Law 2013 and has introduced participatory mechanisms and social audits in response to civil society criticism. This legal reform has a great opportunity to improve bureaucratic accountability and reduce corrupt practices in land use conversion. In the context of digitalization of spatial and land planning, transparency also means opening public access to zoning maps, ownership data, and ongoing or planned land conversion projects. This can strengthen social control and encourage the government to be more accountable in making land conversion policies. Studies in various regions of Indonesia show that community-based spatial information systems (community-based GIS) can serve as a citizen advocacy tool in preventing unauthorized land conversion.

Fifth, economic incentives and disincentives. In addition to normative and institutional approaches, efforts to control the conversion of agricultural land need to be supported by fair and efficient economic mechanisms. In this regard, fiscal incentives and disincentives play an important role as policy tools that can encourage the behavior of the community and business actors in line with the goal of sustainable food land protection. Local governments need to design positive incentive schemes for owners or managers of agricultural land who consistently maintain the function of their land according to its intended use. These forms of incentives can include reductions in land and building tax for productive land, subsidies for agricultural production facilities, easy access to People's Business Credit for agriculture, and guaranteed minimum prices for harvests. In this way, farmers do not feel disadvantaged for maintaining their land and have sustainable economic motivation not to sell or convert their land. On the other hand, progressive disincentives are also needed to curb land use changes that do not comply with spatial planning.[62] For example, the implementation of high land conversion fees, strict adjustments to building permits in productive agricultural areas, and administrative sanctions or fines for violations of land zoning.[63] This disincentive approach is not intended to punish but to internalize the social and ecological costs of uncontrolled land conversion. The right combination of incentives and disincentives will not

[59] Gyula Nagy, Soma Ádám Heiner and Zoltán Kovács, 'Exploring the Presence and Absence of Academic Discourse on Public Participation in the European Green Deal: A Central and Eastern European Perspective', *Societies*, 15.3 (2025), 49 <https://doi.org/10.3390/soc15030049>.
[60] Novianty, Soemarno and Efani.
[61] Tuan.
[62] Giulio Giovannoni, 'Urban Containment Planning: Is It Effective? The Case of Portland, OR', *Sustainability*, 13.22 (2021), 12925 <https://doi.org/10.3390/su132212925>.
[63] Yang Zhou, Xunhuan Li and Yansui Liu, 'Cultivated Land Protection and Rational Use in China', *Land Use Policy*, 106 (2021), 105454 <https://doi.org/10.1016/j.landusepol.2021.105454>.

only strengthen the effectiveness of land protection policies but also create an economic ecosystem that is pro-farmer, pro-food, and pro-environment. This policy will also strengthen the position of agricultural land as a national strategic asset, not just a short-term commercialization object.[64]

Conclusion

From the discussion above, it can be concluded that, *first,* the pattern of agricultural land conversion in Indonesia and Vietnam shows a similar trend, namely the shift of productive land to the non-agricultural sector due to the pressures of urbanization, industrialization, and economic transformation, with significant impacts on food security and spatial sustainability. The driving factors are systemic and multidimensional, encompassing weaknesses in institutional structures, gaps in legal substance, and a pragmatic legal culture in society that lacks support for agricultural land protection in both countries. *Second*, the impact of land-use change on food security includes social changes that threaten farmers' welfare, ecological damage that reduces land quality and production sustainability, and economic dynamics that drive commodity shifts and dependence on imported food. *Third*, there is a need for a reconstruction of agricultural land use conversion regulations that is harmonious, substantive, and implementable, including the harmonization of regulations, strengthening of institutions, affirmation of the social function of land, public participation, and economic mechanisms to achieve a balance between development and the protection of productive land for food sustainability, environmental preservation, and social justice.

References

Adha, M Nasruddin, M Hadin Muhjad and Achmad Faishal, 'As a Result of Legal Transfer of Function of Sustainable Food Agricultural Land to Non-Agriculture', *International Journal of Social Science and Human Research*, 06 (2023) <https://doi.org/10.47191/ijsshr/v6-i7-56>

Akinyemi, Felicia O and Chinwe Ifejika Speranza, 'Agricultural Landscape Change Impact on the Quality of Land: An African Continent-Wide Assessment in Gained and Displaced Agricultural Lands', *International Journal of Applied Earth Observation and Geoinformation*, 106 (2022), 102644 <https://doi.org/10.1016/j.jag.2021.102644>

Anandita, Della Ayu and Kinanti Zukhrufijannah Patria, 'Agriculture Challenges: Decline of Farmers and Farmland (Study from Indonesian Family Life Survey)', *Jurnal Ilmu Ekonomi Dan Pembangunan*, 16 (2017) <https://doi.org/10.20961/jiep.v16i1.2314>

Azadi, Hossein, Ali Akbar Barati, Saeedeh Nazari Nooghabi and Jürgen Scheffran, 'Climate-Related Disasters and Agricultural Land Conversion: Towards Prevention Policies', *Climate and Development*, 14 (2022), 814–28 <https://doi.org/10.1080/17565529.2021.2008291>

Azadi, Hossein, Stefan Burkart, Saghi Movahhed Moghaddam, Hossein Mahmoudi, Kristina Janečková, Petr Sklenička, and others, 'Famine in the Horn of Africa: Understanding Institutional Arrangements in Land Tenure Systems', *Food Reviews International*, 38 (2022), 829–45 <https://doi.org/10.1080/87559129.2021.1888974>

Azadi, Hossein, Fatemeh Taheri, Stefan Burkart, Hossein Mahmoudi, Philippe De Maeyer and Frank Witlox, 'Impact of Agricultural Land Conversion on Climate Change', *Environment, Development and Sustainability*, 23 (2021), 3187–98 <https://doi.org/10.1007/s10668-020-00712-2>

Baye, Fentaw, 'Informal Land Market Mechanisms for Accessing and Securing Land for Housing Development: The Case of Peri-Urban Areas of Woldia Township, Ethiopia', *Cogent Social*

[64] Vinh Bao Ngoc, Nguyen Manh Hung and Phuong Thu Pham, 'Agricultural Restructure Policy in Vietnam and Practical Application for Sustainable Development in Agriculture', ed. by Ajit Kumar Sharma, *Journal of Nanomaterials*, 2021 (2021), 1–13 <https://doi.org/10.1155/2021/5801913>.

Sciences, 11 (2025) <https://doi.org/10.1080/23311886.2025.2482115>

Chanceline, Boutchouang Nghomsi, 'Land Grabbing And Its Impact On Food Security In Sub-Saharan Africa', *SocioEconomic Challenges*, 3 (2019), 72–85 <https://doi.org/10.21272/sec.3(4).72-85.2019>

Ćurčić, Nevena, Andrijana Mirković Svitlica, Jovana Brankov, Željko Bjeljac, Sanja Pavlović and Bojana Jandžiković, 'The Role of Rural Tourism in Strengthening the Sustainability of Rural Areas: The Case of Zlakusa Village', *Sustainability*, 13 (2021), 6747 <https://doi.org/10.3390/su13126747>

Fei, Shulang, Ruiqin Wu, He Liu, Feifei Yang and Nan Wang, 'Technological Innovations in Urban and Peri-Urban Agriculture: Pathways to Sustainable Food Systems in Metropolises', *Horticulturae*, 11 (2025), 212 <https://doi.org/10.3390/horticulturae11020212>

Gandharum, Laju, Djoko Mulyo Hartono, Asep Karsidi, Mubariq Ahmad, Yosef Prihanto, Sidik Mulyono, and others, 'Past and Future Land Use Change Dynamics: Assessing the Impact of Urban Development on Agricultural Land in the Pantura Jabar Region, Indonesia', *Environmental Monitoring and Assessment*, 196 (2024), 645 <https://doi.org/10.1007/s10661-024-12819-4>

Giovannoni, Giulio, 'Urban Containment Planning: Is It Effective? The Case of Portland, OR', *Sustainability*, 13 (2021), 12925 <https://doi.org/10.3390/su132212925>

Gramaglia, Christelle, Marlène Rio, Christian Salles and Marie-George Tournoud, 'Reducing the Imperviousness of Urban Soils to Enhance the Quality of Surface Water: Obstacles and Levers to Implementing Ecological Runoff Management in the South of France', *Journal of Hydrology*, 636 (2024), 131168 <https://doi.org/10.1016/j.jhydrol.2024.131168>

Ben Hassen, Tarek and Hamid El Bilali, 'Impacts of the Russia-Ukraine War on Global Food Security: Towards More Sustainable and Resilient Food Systems?', *Foods*, 11 (2022), 2301 <https://doi.org/10.3390/foods11152301>

Hou, Dawei, Fanhao Meng and Alexander V. Prishchepov, 'How Is Urbanization Shaping Agricultural Land-Use? Unraveling the Nexus between Farmland Abandonment and Urbanization in China', *Landscape and Urban Planning*, 214 (2021), 104170 <https://doi.org/10.1016/j.landurbplan.2021.104170>

Hu, Qing, Heping Huang and Chih-Chun Kung, 'Ecological Impact Assessment of Land Use in Eco-Industrial Park Based on Life Cycle Assessment: A Case Study of Nanchang High-Tech Development Zone in China', *Journal of Cleaner Production*, 300 (2021), 126816 <https://doi.org/10.1016/j.jclepro.2021.126816>

Iwuchukwu, Felicitas U, Ugochukwu Ewuzie, Oluwaseun J Ajala, Victor E Ojukwu, Innocent C Nnorom, Johnbosco C Egbueri, and others, 'A Consideration of the Climatic Drivers, Focal Points and Challenges of Soil Erosion, Land Degradation, Landslides and Landscapes in Nigeria', 2023, pp. 449–77 <https://doi.org/10.1007/978-3-031-21007-5_23>

Juniyanti, Lila, Herry Purnomo, Hariadi Kartodihardjo and Lilik Budi Prasetyo, 'Understanding the Driving Forces and Actors of Land Change Due to Forestry and Agricultural Practices in Sumatra and Kalimantan: A Systematic Review', *Land*, 10 (2021), 463 <https://doi.org/10.3390/land10050463>

Kelly-Fair, Mira, Sucharita Gopal, Magaly Koch, Hermin Pancasakti Kusumaningrum, Muhammad Helmi, Dinda Khairunnisa, and others, 'Analysis of Land Use and Land Cover Changes through the Lens of SDGs in Semarang, Indonesia', *Sustainability*, 14 (2022), 7592 <https://doi.org/10.3390/su14137592>

Leng, Zhihua, Yana Wang and Xinshuo Hou, 'Structural and Efficiency Effects of Land Transfers on Food Planting: A Comparative Perspective on North and South of China', *Sustainability*, 13 (2021), 3327 <https://doi.org/10.3390/su13063327>

Liao, Yixin, Xiaojun Lu, Jialin Liu, Jiajun Huang, Yue Qu, Zhi Qiao, and others, 'Integrated Assessment of the Impact of Cropland Use Transition on Food Production Towards the Sustainable Development of Social–Ecological Systems', *Agronomy*, 14 (2024), 2851 <https://doi.org/10.3390/agronomy14122851>

Lupascu, Massimo, Pierre Taillardat, Sigit D Sasmito, F Agus, Daniel Mudiyarso, Sorain J Ramchunder, and others, 'Climate-Smart Peatland Management and the Potential for Synergies between Food Security and Climate Change Objectives in Indonesia', *Global Environmental Change*, 82 (2023), 102731 <https://doi.org/10.1016/j.gloenvcha.2023.102731>

Lyu, Xiao, Wenlong Peng, Shandong Niu, Yi Qu and Zongfei Xin, 'Evaluation of Sustainable Intensification of Cultivated Land Use According to Farming Households' Livelihood Types', *Ecological Indicators*, 138 (2022), 108848 <https://doi.org/10.1016/j.ecolind.2022.108848>

Mahyudin, Mahyudin, Muh Akmal Ibrahim, Muhammad Yunus and Syahribulan Syahribulan, 'Public Policy Network Implementation: A Case Study in the Development Urban Farming for Sustainable Food Independence in Makassar City', *Journal of Management and Administration Provision*, 5 (2025), 34–42 <https://doi.org/10.55885/jmap.v5i1.513>

Molotoks, Amy, Pete Smith and Terence P Dawson, 'Impacts of Land Use, Population, and Climate Change on Global Food Security', *Food and Energy Security*, 10 (2021) <https://doi.org/10.1002/fes3.261>

Mulya, Setyardi Pratika, Delik Hudalah, Niken Prilandita and Anjar Dimara Sakti, 'Spatio-Temporal Changes in Agricultural Land and Rural–Urban Transitions in Greater Jakarta, Indonesia', *Regional Environmental Change*, 24 (2024), 145 <https://doi.org/10.1007/s10113-024-02306-4>

Nagy, Gyula, Soma Ádám Heiner and Zoltán Kovács, 'Exploring the Presence and Absence of Academic Discourse on Public Participation in the European Green Deal: A Central and Eastern European Perspective', *Societies*, 15 (2025), 49 <https://doi.org/10.3390/soc15030049>

Nam, Pham Phuong, Phan Thi Thanh Huyen and Pham Van Ha, 'Factors Affecting the Management of Public Agricultural Land Fund in Gia Lam District, Hanoi City, Vietnam', *Land Use Policy*, 101 (2021), 105151 <https://doi.org/10.1016/j.landusepol.2020.105151>

Natadireja, Riezky Ruskandi, Sinta Ningrum and Ramadhan Pancasilawan, 'Dynamics Of Indonesian Agricultural Policy From 1945-2022', *Eduvest - Journal of Universal Studies*, 4 (2024), 5642–64 <https://doi.org/10.59188/eduvest.v4i7.1539>

Ngoc, Vinh Bao, Nguyen Manh Hung and Phuong Thu Pham, 'Agricultural Restructure Policy in Vietnam and Practical Application for Sustainable Development in Agriculture', ed. by Ajit Kumar Sharma, *Journal of Nanomaterials*, 2021 (2021), 1–13 <https://doi.org/10.1155/2021/5801913>

Nguyen, Phan Chi, Pham Thanh Vu, Nguyen Quoc Khuong, Huynh Vuong Thu Minh and Huynh Anh Vo, 'Saltwater Intrusion and Agricultural Land Use Change in Nga Nam, Soc Trang, Vietnam', *Resources*, 13 (2024), 18 <https://doi.org/10.3390/resources13020018>

Novianty, Puput Cindy, Soemarno and Anthon Efani, 'Analyzing Land Conversion Rate and Conversion Farmer Household Food Security in Bakalan Village, Pasuruan Regency', *Jurnal Penelitian Pendidikan IPA*, 11 (2025), 415–24 <https://doi.org/10.29303/jppipa.v11i1.7583>

Pham Thi, Nhung, Martin Kappas and Heiko Faust, 'Impacts of Agricultural Land Acquisition for

Urbanization on Agricultural Activities of Affected Households: A Case Study in Huong Thuy Town, Thua Thien Hue Province, Vietnam', *Sustainability*, 13 (2021), 8559 <https://doi.org/10.3390/su13158559>

Phan, Nguyen Thai, Ji-Yong Lee and Nguyen Duc Kien, 'The Impact of Land Fragmentation in Rice Production on Household Food Insecurity in Vietnam', *Sustainability*, 14 (2022), 11162 <https://doi.org/10.3390/su141811162>

Prabhakar, SVRK, 'A Succinct Review and Analysis of Drivers and Impacts of Agricultural Land Transformations in Asia', *Land Use Policy*, 102 (2021), 105238 <https://doi.org/10.1016/j.landusepol.2020.105238>

Prasada, Imade Y and Agus D Nugroho, 'Determinant Factors of the Agricultural Land Sustainability in Indonesia', 2022 <https://doi.org/10.2991/absr.k.220305.043>

Prayitno, Gunawan, Dian Dinanti, Izzatul Ihsansi Hidayana and Achmad Tjachja Nugraha, 'Place Attachment and Agricultural Land Conversion for Sustainable Agriculture in Indonesia', *Heliyon*, 7 (2021), e07546 <https://doi.org/10.1016/j.heliyon.2021.e07546>

Purnomo, Herry, Dyah Puspitaloka, Beni Okarda, Agus Andrianto, Nurul Qomar, Sigit Sutikno, and others, 'Community-Based Fire Prevention and Peatland Restoration in Indonesia: A Participatory Action Research Approach', *Environmental Development*, 50 (2024), 100971 <https://doi.org/10.1016/j.envdev.2024.100971>

Ranjithkumar, A, 'Assessing the Impact of Agricultural Land Reduction on Future Global Food Security : Challenges and Sustainable Solutions', *Indian Journal of Natural Sciences*, 15 (2025), 89066–83

Rehman, Abdul and Muhammad Farooq, 'Challenges, Constraints, and Opportunities in Sustainable Agriculture and Environment', in *Sustainable Agriculture and the Environment* (Elsevier, 2023), pp. 487–501 <https://doi.org/10.1016/B978-0-323-90500-8.00012-9>

Rehman, Abdul, Muhammad Farooq, Dong Jin Lee and Kadambot HM Siddique, 'Sustainable Agricultural Practices for Food Security and Ecosystem Services', *Environmental Science and Pollution Research*, 29 (2022), 84076–95 <https://doi.org/10.1007/s11356-022-23635-z>

Rosyada, Nisrina Dhiya, 'The Spatial Context of the Removal of Sustainable Rice Fields in Surakarta City', *Journal of Geosciences and Environmental Studies*, 2 (2025), 1–15 <https://doi.org/https://doi.org/10.53697/ijgaes.v2i1.34>

Shi, Xiuhua, Fei Zhou and Zhe Wang, 'Research on Optimization of Ecological Service Function and Planning Control of Land Resources Planning Based on Ecological Protection and Restoration', *Environmental Technology & Innovation*, 24 (2021), 1–17 <https://doi.org/10.1016/j.eti.2021.101904>

Sholecha, Arvita Fajar and Rahayu Subekti, 'Implementation of Protected Paddy Land Control in Indonesia', *International Journal of Law*, 10 (2024), 1–8 <https://www.lawjournals.org/assets/archives/2024/vol10issue2/10054.pdf>

Soediro, Soediro, Mahdi Muhammad and Kem Nori Alfath, 'The Role of Public Participation in Agricultural Land Conversion to Achieve National Food Security', *Jurnal Dinamika Hukum*, 24 (2024), 314 <https://doi.org/10.20884/1.jdh.2024.24.3.15563>

Sutrisni, Ni Komang, Putu Angga Pratama Sukma, Rahimah Embong and Khanlar Haydarov, 'The Compliance of Governance on Family Data Protection Regulation', *Journal of Human Rights, Culture and Legal System*, 4 (2024), 706–41 <https://doi.org/https://doi.org/10.53955/jhcls.v4i3.293>

Thow, Anne Marie, 'Enhancing Global Support to Address Complex Sustainable Development Policy Challenges: Learning from Success in Cross-sectoral Nutrition Policy', *Sustainable Development*, 33 (2025), 1835–47 <https://doi.org/10.1002/sd.3191>

Tran Tuan, Nguyen, 'Shrinking Agricultural Land and Changing Livelihoods after Land Acquisition in Vietnam', *Bulletin of Geography. Socio-Economic Series*, 53 (2021), 17–32 <https://doi.org/10.2478/bog-2021-0020>

Tuan, Nguyen Tran, 'Urbanization and Land Use Change: A Study in Vietnam', *Environmental and Socio-Economic Studies*, 10 (2022), 19–29 <https://doi.org/10.2478/environ-2022-0008>

Ustaoglu, Eda and Brendan Williams, 'Institutional Settings and Effects on Agricultural Land Conversion: A Global and Spatial Analysis of European Regions', *Land*, 12 (2022), 47 <https://doi.org/10.3390/land12010047>

Viana, Cláudia M, Dulce Freire, Patrícia Abrantes, Jorge Rocha and Paulo Pereira, 'Agricultural Land Systems Importance for Supporting Food Security and Sustainable Development Goals: A Systematic Review', *Science of The Total Environment*, 806 (2022), 150718 <https://doi.org/10.1016/j.scitotenv.2021.150718>

Wang, Aoyang, Xiaoyu Liao, Zhijun Tong, Walian Du, Jiquan Zhang, Xingpeng Liu, and others, 'Spatial-Temporal Dynamic Evaluation of the Ecosystem Service Value from the Perspective of "Production-Living-Ecological" Spaces: A Case Study in Dongliao River Basin, China', *Journal of Cleaner Production*, 333 (2022), 130218 <https://doi.org/10.1016/j.jclepro.2021.130218>

Worachairungreung, Morakot, Nayot Kulpanich, Kunyaphat Thanakunwutthirot and Phonpat Hemwan, 'Monitoring Agricultural Land Loss by Analyzing Changes in Land Use and Land Cover', *Emerging Science Journal*, 8 (2024), 687–99 <https://doi.org/10.28991/ESJ-2024-08-02-020>

Xu, Hui, Zhixiong Fan, Fayyaz Ahmad and Dawei Zhang, 'Exploring the Ecological Protection Impacts of Cultivated Land Transfer: Explanation Based on Fertilizers and Pesticides', *Ecological Indicators*, 154 (2023), 110681 <https://doi.org/10.1016/j.ecolind.2023.110681>

Yu, Meng, Zhenhua Chen, Ying Long and Yuri Mansury, 'Urbanization, Land Conversion, and Arable Land in Chinese Cities: The Ripple Effects of High-Speed Rail', *Applied Geography*, 146 (2022), 102756 <https://doi.org/10.1016/j.apgeog.2022.102756>

Zhang, Zhihui, Samane Ghazali, Astrida Miceikienė, Dejan Zejak, Shahla Choobchian, Marcin Pietrzykowski, and others, 'Socio-Economic Impacts of Agricultural Land Conversion: A Meta-Analysis', *Land Use Policy*, 132 (2023), 106831 <https://doi.org/10.1016/j.landusepol.2023.106831>

Zhou, Yang, Xunhuan Li and Yansui Liu, 'Cultivated Land Protection and Rational Use in China', *Land Use Policy*, 106 (2021), 105454 <https://doi.org/10.1016/j.landusepol.2021.105454>