

Economic Valuation in Sustainable Land Use Planning: A Conceptual Framework

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Abstract

Increased economic growth drives the need for broader land use in regional development. A spatial planning approach focused on economic growth faces several problems, including the conversion of productive land, expanding urban sprawl, the exploitation of strategic areas, and inequities in land use. Furthermore, assessments of land use remain limited to economic value; social, ecological, and spatial characteristics have not been fully integrated. This study aims to examine the role of economic valuation in sustainable land-use planning and to propose a conceptual framework that integrates economic, social, ecological, and spatial dimensions. The study employs a qualitative approach through a critical-conceptual analysis of relevant literature, policies, and secondary data. The analysis identified the limitations of existing valuation approaches and synthesized interrelationships among concepts to support the development of the conceptual framework. The research resulted in the Sustainable Spatial Economic Valuation Framework, which integrates economic value, social functions, ecological support, and spatial characteristics as the basis for assessing and optimizing sustainable land use.

Keywords: *Economic Valuation, Sustainable Land Use Planning, Land Use, Spatial Planning, Sustainable Development.*

INTRODUCTION

Economic growth has increased demand for land use (Adiningsih & Setiawan, 2025a; F. Xu et al., 2025). Regional development activities have grown significantly, in line with Indonesia's economic growth rate, which has remained stable at around 5% per year, reaching 5.11% in 2024. This economic growth has driven the expansion of residential areas, infrastructure, industry, and various other economic activity centers, which has impacted land-use patterns (Gong et al., 2023a; Keshavarzi et al., 2026a). Data on residential land cover in Indonesia show a continued upward trend, from 2,613.6 thousand hectares in 2014 to 4,419.9 thousand hectares in 2023. This indicates that increasing demand for land that is not managed sustainably can lead to land-use planning issues such as the conversion of productive land, uncontrolled urban sprawl, and pressure on environmental capacity (Morshed et al., 2024a; Suroso & Firman, 2018a).

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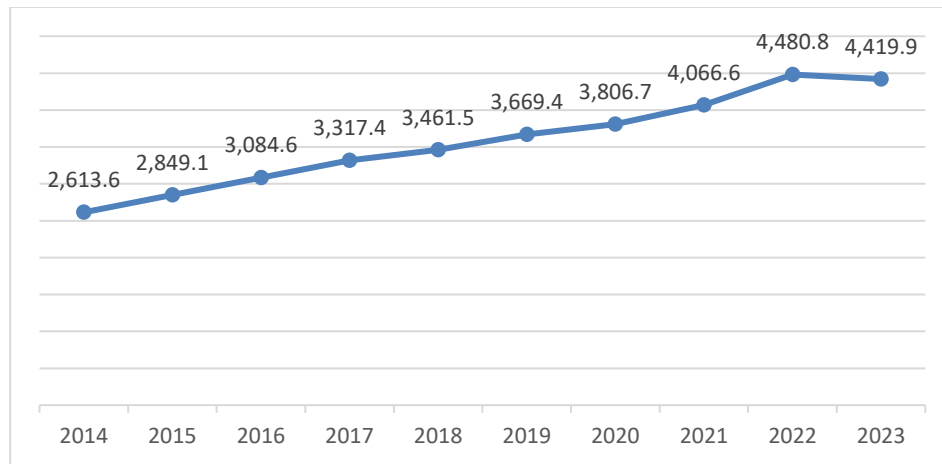


Figure 1. Trend in Residential Land-Use Conversion in Indonesia (Thousand Ha)
Source: Statistics Indonesia (BPS), processed data, 2026.

Land-use policies remain limited to prioritizing economic growth as the primary goal of development (Pallaske, 2024; Spash, 2022). Land conversion in development zones is generally intended to support industrial and residential activities (Chikaraishi et al., 2015). This is supported by data from the construction and real estate sectors, which contribute 9.65% and 2.69%, respectively, to Indonesia's GDP (BPS, 2025). However, this poses risks to ecological sustainability and social functions of land (Castro & Lechthaler, 2022; Taye et al., 2021a).

Potential land-use imbalances caused by urban sprawl into green spaces and agricultural land impact national food security, community stability, and environmental quality in both urban and archipelagic regions, while weakening land-use regulations (Iqbal et al., 2024a; Surya et al., 2021a; Zhou et al., 2020). The exploitation of productive land has the potential to degrade soil quality and reduce agricultural productivity, as well as increase the vulnerability and social inequality of communities dependent on land resources (Abbas et al., 2025; Liu et al., 2022a; Sukiptiyah et al., 2022; Yang et al., 2023), widening interregional disparities in development benefits and development externalities.

Indonesian empirical studies highlight the importance of ecological and social values in land valuation. A study in Yogyakarta underscores the importance of measuring the total economic value of agricultural land including indirect benefits such as flood control while promoting digital agriculture and farmer regeneration (Harini et al., 2025). This is supported by data on mangrove ecosystems, which also yield an estimated total economic value of Rp49,260,590.16 per hectare and can serve as the basis for evidence-based policies to prevent destructive land-use conversion and safeguard the well-being of local communities (Gunawan et al., 2025; Marlianingrum et al., 2019; Rahayu et al., 2024).

Based on the theoretical and empirical studies described above, research on land economic valuation and land-use optimization generally employs conventional quantitative approaches that focus on measuring market value, land productivity, and spatial modeling (Knoke et al., 2020a; Liu et al., 2022b; Wang et al., 2022). However, studies critically examining the dominance of economic growth in spatial planning remain limited (Pallaske, 2024; Spash, 2022). Alternative frameworks integrating economic value, social functions, and ecological carrying capacity have not been widely developed in Indonesia (Castro & Lechthaler, 2022; Wicaksono et al., 2026a). This gap forms the basis of this study to develop a concept of sustainable spatial economic assessment as an alternative framework for evaluating land use. Using a descriptive qualitative approach, this study formulates a framework that integrates economic value, social functions, and ecological sustainability as the basis for a more comprehensive and sustainable assessment of land use.

LITERATURE REVIEW

Economic valuation is used to measure the value of a resource based on its benefits to society. In the context of land, this approach considers not only market value but also social and environmental benefits, as well as ecosystem services (Gong et al., 2023b). Total Economic Value (TEV), which broadens the assessment by integrating use and non-use values (Cardoso, 2018; Ma et al., 2024). Economic assessments in land-use planning aim to consider various land-use alternatives. It has been shown that integrating economic, social, and environmental aspects results in a more comprehensive assessment of land use (Ma et al., 2023). Various economic instruments can also help control land conversion and improve land-use efficiency (Ackerschott et al., 2023; Fernandez & Reydon, 2024).

Spatial planning is the process of regulating land use to guide the distribution of economic, social, and environmental activities toward sustainable development (Mehari & Genovese, 2023). Spatial planning creates economic efficiency by establishing zones and infrastructure. Economic growth drives increased demand for land for various production and service activities. This leads to a shift in land-use patterns from the primary sector toward the secondary and tertiary sectors, particularly in regions experiencing rapid economic development. These changes indicate that spatial planning is closely linked to the dynamics of a region's economic growth (B. Han, X. Jin, R. Sun, 2023).

Sustainable development requires balancing economic goals with environmental sustainability and social well-being (Xu et al., 2023), echoing the triple bottom line of economic, social, and environmental dimensions. The Land Use Functions (LUFs) concept operationalizes this by assessing economic, social, and environmental functions together (Peng et al., 2023). Optimizing land use under population growth and urbanization also requires attention to environmental carrying capacity to prevent the conversion of productive land (Huang et al., 2023), reinforced by economic instruments and by natural capital valuation covering ecosystem services, carbon sequestration, biodiversity conservation, and hydrological functions (Jiang et al., 2017).

Prior research confirms that land-use valuation must weigh economic, social, ecological, and spatial benefits together (Harini et al., 2025) acknowledging spatial variation in ecosystem-service value (Peng et al., 2023; Wuryandani et al., 2026). While studies stress an integrated approach to spatial sustainability (B. Han et al., 2023; Castro & Lechthaler, 2022), the literature remains fragmented, lacking a single framework integrating economic valuation with social, ecological, and spatial dimensions the gap addressed by the Sustainable Spatial Economic Valuation Framework.

RESEARCH METHODOLOGY

This study employs a descriptive qualitative approach through a qualitative literature review with thematic analysis to identify and synthesize the economic, environmental, and social dimensions of various land-use patterns in support of optimizing sustainable land use. The qualitative approach was used to develop a deep conceptual understanding of the orientation of economic growth in spatial planning and its implications for sustainable land use (Denny & Weckesser, 2022). Data collection used the Scopus database because of its extensive coverage, standardized data quality, and status as a credible international academic reference source. The data were obtained from the Scopus database covering the publication period 2022–2026. Documents were selected based on the use of the keywords “land-use planning,” “land valuation,” “spatial planning,” “economic growth,” and “sustainability,” resulting in a total of 100 documents for analysis. The data were then synthesized using thematic analysis to identify patterns of meaning across the literature (Lahiri, 2023; Thottoli, 2025).

The analysis was conducted using three complementary techniques: content analysis to identify the conceptual content of the literature under review ([Chand, 2025](#)), critical interpretation to critically examine the assumptions underlying the economic growth orientation in spatial planning ([Lim, 2025](#)), as well as a comparative analysis to compare various land valuation approaches to formulate a more comprehensive and sustainable concept of sustainable spatial economic valuation ([Moresi et al., 2022](#)). The results of the analysis were then synthesized to formulate the Sustainable Spatial Economic Valuation Framework as a conceptual framework to support land-use decision-making.

FINDINGS AND DISCUSSION

A New Paradigm for Spatial Planning from the Perspective of Economic Growth

The purpose of economic growth has led to a shift in perspectives on space in regional planning. Beyond its social and ecological roles, space increasingly functions as an instrument in capital accumulation and the expansion of built-up areas ([Haque & Sharifi, 2024a](#); [Spash, 2022](#); [Surya et al., 2021b](#)). From this perspective, the value of space is measured based on its contribution to economic output, meaning that ecological and social functions lacking direct market value risk being sidelined in planning ([Iqbal et al., 2024b](#); [Locatelli et al., 2025](#); [Morgan et al., 2022](#)). This aligns with the pattern found in neoclassical economic thought, which uses GDP as an indicator of development—an approach that tends to underrepresent ecological value because it is difficult to assess in monetary terms ([Goodland & Ledec, 1987](#); [W. Xu et al., 2020](#)),

This approach directly shapes policies related to investment and territorial expansion. Indonesia's Risk-Based Approach to the Online Single Submission System (OSS-RBA) positions spatial planning as a tool to facilitate investment, making the synchronization of permits and land use the primary goal of interagency collaboration, which impacts land value ([Adiningsih & Setiawan, 2025b](#); [Wicaksono et al., 2026a](#)). At the regional level, exploitative development policies and resource-based expansion have led to long-term damage to sustainability ([Gong et al., 2023b](#)). This also occurs in approaches dominated by uncontrolled urban sprawl, the conversion of productive land, inequitable land use, and a decline in environmental carrying capacity ([Khreis et al., 2023](#); [Morshed et al., 2024b](#); [Tran Phu et al., 2026a](#)) where land conversion for industrial and residential purposes increases the risk of economic losses and environmental degradation, while neglecting ecosystem services ([Januar et al., 2023](#); [Suroso & Firman, 2018b](#); [Taye et al., 2021a](#)).

Land valuation in planning and investment decisions still relies heavily on market-based indicators—market value, land prices, property values, and conventional cost-benefit analysis (CBA). Land Value Zones in Indonesia are based solely on market transactions, without accounting for the ecological value lost due to land conversion ([Adiningsih & Setiawan, 2025b](#)); one example is the pricing of urban green infrastructure based solely on its impact on surrounding property values ([Dell'Anna et al., 2022a](#)). CBA has similar limitations: Net Present Value (NPV) may overestimate the value of conversion projects relative to conservation because it does not fully capture the distribution of benefits across groups or how those benefits change over time ([Knoke et al., 2020a](#)), and ecosystem services and other intangible benefits remain underrepresented in cost-benefit calculations ([Goodland & Ledec, 1987](#)).

Another aspect of value that needs to be considered is the fact that ecosystem services generate benefits that exceed their market value: forest services alone can be worth far more than timber, although estimates vary depending on the type of service, forest cover, and valuation method ([Ninan & Kontoleon, 2016](#); [Taye et al., 2021](#)), while pollination and habitat services can also be quantified to support evidence-based conservation policies ([Chaplin-Kramer et al., 2011](#); [Hanley et al., 2015](#)). Social value can be accounted for through aspects of distributive justice, implementation guidelines, and its distributed benefits to communities through measurements

beyond monetary value ([Nazmul Haque & Sharifi, 2024](#); [Ruckelshaus et al., 2015](#)).

Overall, these dimensions indicate that spatial valuation can shift from a market-based approach toward a multidimensional approach that integrates economic, social, cultural, and environmental values—placed within a spatial context to assess how benefits and impacts are distributed across different regions, thereby forming the basis for Sustainable Spatial Economic Valuation

Sustainable Spatial Economic Valuation

A development orientation that prioritizes economic growth as its primary goal systematically shapes land-use patterns across various regions. Based on a review of the literature, these impacts can be categorized into three interrelated dimensions: economic, environmental, and social impacts.

Table 1. Impacts of Economic Growth-Oriented Spatial Planning on Land Use

Dimension	Key impacts and representative evidence
Economic	Growth-driven investment is concentrated in specific locations without regard for carrying capacity: a spatially suboptimal industrial layout has increased the health and economic burdens associated with PM2.5 in China (W. Xu et al., 2020), and uneven property development in Indonesia indicates that the business licensing system is not yet well integrated with land-use planning (Adiningsih & Setiawan, 2025c ; Wicaksono et al., 2026b). Concentrated investment has the potential to exacerbate regional disparities, including economic dynamics (Gong et al., 2023c ; Keshavarzi et al., 2026b).
Environmental	Development contributes to urban sprawl, landscape fragmentation, and a decline in biocapacity (Morshed et al., 2024c ; Tran Phu et al., 2026b); land conversion disregards ecosystem services that are often overlooked in conventional assessments, including the impacts of deforestation (Knoke et al., 2020b ; Taye et al., 2021b) and land degradation resulting from poorly integrated agricultural systems (Tiemann & Douxchamps, 2023). Coastal and marine development can damage habitats (Duda & Sherman, 2002 ; Firth et al., 2024), and on the northern coast of Java, the conversion of protected areas and fish ponds for industrial purposes has increased environmental risks (Suroso & Firman, 2018c).
Social	The competition between economic and ecological interests leads to land-use conflicts, such as those involving extractive activities (Cardoso, 2018 ; Kohn et al., 2026), and poses challenges for the economic livelihoods of fishermen and conservation efforts (Booth et al., 2023). Urban development pressures reduce access to public spaces and green spaces (Bressane et al., 2024 ; Dell'Anna et al., 2022b ; Haque & Sharifi, 2024b), and unequal access to space and resources contributes to spatial segregation (Keshavarzi et al., 2026b).

Sources: Author's compilation

These three dimensions highlight the interrelationship between economic growth, environmental change, and social welfare. Regional investment priorities can drive changes in land use and ecological pressures, which may lead to conflict, inequality, and the spatial distribution of benefits. This indicates that evaluations of land use should not focus solely on economic aspects but also on the spatial environmental, and social impacts that result. These findings serve as a crucial foundation for the development of the Sustainable Spatial Economic Valuation approach, which integrates these three dimensions into spatial planning decision-making.

Application of Economic Valuation of Land Use: An Illustration Using an Audit Subject

To illustrate the proposed framework, economic land-use analysis aims to assess the feasibility of spatial planning models, optimize land-use value, enhance resource efficiency, and reduce potential land-use conflicts. This analysis considers economic benefits—such as increased community income, job creation, higher land value utilization, and greater local tax revenue—against economic costs, including those associated with infrastructure development, environmental management, social costs resulting from relocation and conflicts, environmental damage, and facility maintenance.

The implications extend beyond the calculation of direct benefits and costs to include changes in regional economic structure, income distribution, urbanization, and community livelihoods, as well as multiplier effects on related economic sectors and changes in land value. Calculating the economic benefits and costs of land-use changes requires data such as the area affected (hectares), the type of replacement activity, annual production value, rent or land prices, employment, and per capita income.

As an illustration, Table 2 summarizes indicative economic value ranges compiled from data from the Central Statistics Agency and the Agriculture and Horticulture Statistics Agency (SPH, 2022) as well as from real estate listings covering several land-use categories relevant to the land-use audit in the Special Region of Yogyakarta.

Table 2. Indicative Economic Value of Selected Land-Use Categories

Land-use category	Indicative economic value	Notes
Horticulture	Rp 5,000 – Rp 150,000 /m ² /year	Varies by crop, from leafy vegetables (lowest) to ornamental plants (highest).
Food-crop agriculture	Average Rp 3,750 /m ² /year	Sweet potato and rice show the highest values; soybean the lowest.
Local protection areas	Rp 500 – Rp 5,000 /m ² /year (non-market)	Flood prevention, water-source conservation, erosion control, biodiversity protection; often excluded from market-based valuation.
Smallholder plantations	Average Rp 650 – Rp 4,800 /m ² /year	Lowest for rubber; highest for cloves and sugarcane, depending on commodity.

Source: Compiled by the authors from BPS/SPH (2022) and real-estate market data (rumah123.com; 99.co).

These empirical findings reinforce the conceptual argument discussed earlier—that a single market-price-based valuation approach is insufficient to reflect the full economic value—let alone the ecological and social value—of an area, thus necessitating a more comprehensive valuation framework as proposed in the Sustainable Spatial Economic Valuation Framework.

As a synthesis of the entire discussion above—ranging from the paradigm shift in spatial planning, the limitations of market-based valuation approaches, the various dimensions of value overlooked in calculations, the economic, environmental, and social impacts of a growth-oriented approach, to empirical illustrations of economic value calculations for the audit subjects—Figure 2 presents the Sustainable Spatial Economic Valuation Framework proposed in this study.

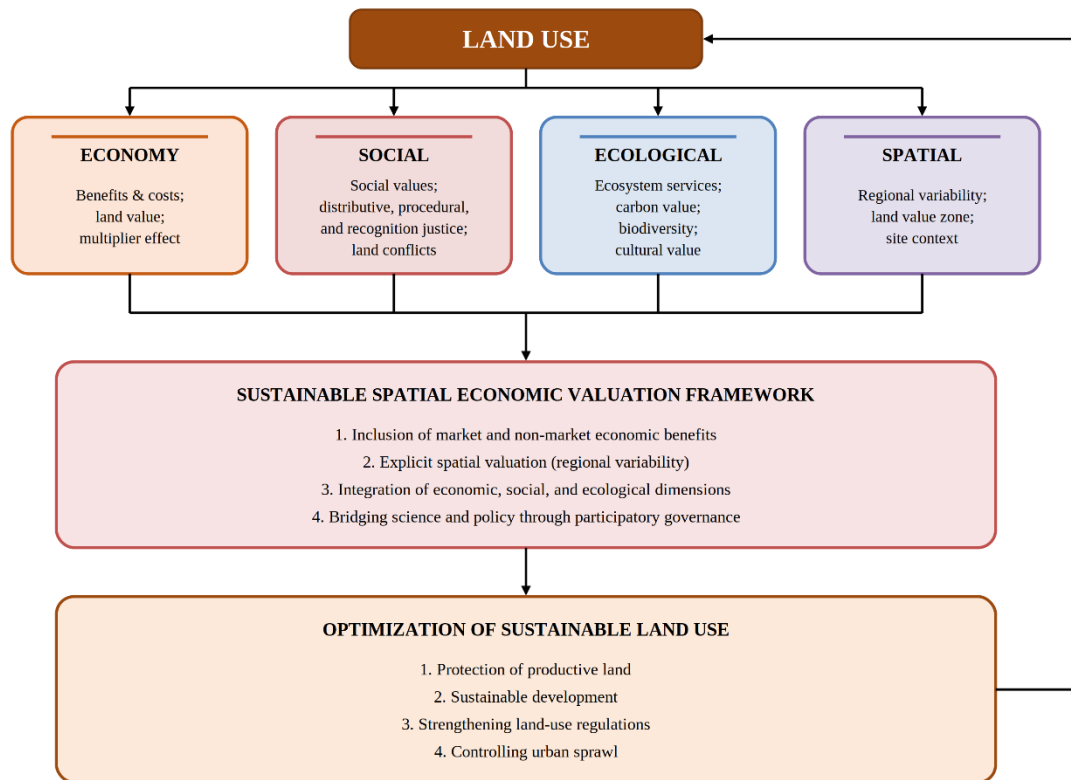


Figure 2. Sustainable Spatial Economic Valuation Framework

Sources: Author

This framework positions land use as a starting point that must be evaluated simultaneously across four dimensions—economic, social, ecological, and spatial. These four dimensions are integrated through four key principles: incorporating both market and non-market economic benefits; explicit spatial assessment that accounts for regional variability; integration of the economic, social, and ecological dimensions; and bridging science and policy through participatory governance. This integration aims to support the optimization of sustainable land use. This conceptual framework emphasizes that this process is cyclical; that is, the results of monitoring and evaluating the implementation of spatial planning policies must be continuously incorporated into subsequent spatial planning processes through participatory governance mechanisms.

CONCLUSION AND FURTHER RESEARCH

This study shows that a spatial planning orientation centered on economic growth results in land use patterns that prioritize market value while neglecting ecological, social, and spatial values—which actually play a key role in determining a region’s long-term sustainability. Nevertheless, this study also found that these five dimensions of value can now be measured more reliably through various contemporary valuation methods, ranging from ecosystem service valuation, distributive justice approaches, multi-value valuation streams, carbon value estimation, to biodiversity shadow pricing.

These findings form the basis for the formulation of the Sustainable Spatial Economic Valuation Framework, which integrates economic, social, ecological, and spatial. This framework is not intended to negate economic considerations in spatial planning, but rather to broaden the information base for decision-making so that land use can be evaluated in a more comprehensive, equitable, and sustainable manner.

Theoretically, the study contributes a conceptual synthesis bridging neoclassical economics, ecological economics, and regional planning. Practically, the framework can guide local governments and planning agencies in formulating spatial policies that protect productive land and ecological function while still supporting investment and economic growth.

As a conceptual-critical, literature-based study, this research has not been empirically tested, draws on evidence from diverse geographic contexts, and has not yet developed operational indicators for each dimension. Future research should (1) test the framework through case studies in regions facing high land-conversion pressure, (2) develop quantitative indicators that can be integrated into planning and permitting systems such as OSS-RBA, and (3) examine incentive mechanisms—progressive land taxes, payments for ecosystem services, and carbon offsets—to support implementation.

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