

## Article

# Urbanization and Land Use Planning for Achieving the Sustainable Development Goals (SDGs): A Case Study of Greece

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**Abstract:** Sustainable development has attracted the attention of social-economic, spatial well-being, and cultural continuity advocates across the world. However, the processes involved in land use as well as urban development have continued to affect the attainment of sustainable development. This study assessed the effects of urbanization and land use planning on achieving sustainable development goals. The data were collected using a survey questionnaire from 384 different government leaders in Greece. The study showed that the indicators of urbanization quality have a positive effect on sustainable development goals. It was revealed that there is a significant relationship between integrated land use strategies and sustainable development goals. The study showed that indicators of urbanization quality are very key to achieving different SDGs. This indicates that sustainable urbanization entails more than just converting agricultural land and forests without making any changes to them into cities, and it is equally one of the answers to the problem of the world's population growth if it is done with vision and dedication. The study clearly shows that integrated land use strategies are important in achieving the SDGs. In this case, land use planning is mostly a local effort, though some nations employ guiding land use plans created at the regional or inter-municipal level. Furthermore, urbanization opportunities and land-use plans have a great influence on the achievement of sustainable development goals. Notably, the goal of sustainable urban development is to make urban areas “sustainable” as well as to build or reinforce the city's sustainability-related economic, social, cultural, and environmental aspects. It then goes on to discover how to spread that idea and why it is important to be focused, using various definitions. The fundamental idea of sustainable urban development is then realized by reviewing the ideas and principles of sustainable development. Finally, some general recommendations are made regarding urban planning, sustainable urban development, and the significance of establishing the necessary conditions for its realization. Urban sustainability and proper use of land require structural changes as well as significant, fundamental shifts at all societal levels.

**Keywords:** sustainable development; urban development; urbanization; land use planning



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## 1. Introduction

Land use and urbanization modifications caused by human factors are apparent everywhere. Important variables include direct drivers such as population expansion or infrastructure system modifications as well as indirect drivers such as energy transition processes. As a result, a wide range of land use disputes have arisen [1–3]. The negative implications of land use on combating climate change, protecting biodiversity, and sustaining vital ecosystem services are increasingly gaining prominence in political and scholarly discussions. In addition, cities have drawn increased attention as the locations

of the primary issues with global sustainable development, as well as the locations of the solutions, as the percentage of the world's population living in urban areas has crossed fifty percent [4,5]. According to Nukala and Mutz (2015) [6], the post-2015 agenda must be meaningful for urban people, and the struggle for sustainable development will be won or lost in cities [7,8]. The adoption of sustainable development goals (SDGs) for cities marks a turning point in the understanding of their significance, not just as development sites but also as significant players in global governance and international politics [9–11].

Sustainable development is also affected by problems related to land usage [12,13]. The United Nations World Conference in Rio in 1992 established Agenda 21, which led to greater awareness of issues related to land use, urban growth, agriculture, and forestry and intensified debate during the next three decades. This also happened to a significant degree via bottom-up local efforts such as local Agenda 21 [3,12,14,15]. Modern normative discourses have been influenced by the UN-SDGs, which have resulted in a renewed drive for more sustainable land use. Compactness is the feature of urban form (shape, density, and land use) that limits the overexploitation of natural resources and enhances economies of agglomeration, with advantages for inhabitants in terms of closeness [16–18]. It is determined by the population and built-up area densities as well as the concentration of urban functions [4,11]. The UN SDGs are global development objectives, and specifications for regional and local levels are required in a multi-level governance structure. Further, the Territorial Agenda has made the initial moves on the European level, albeit they are not yet current [16,19]. National governments, including Greece, have also established sustainability policies and indicators at the national level. However, interpretations of international points of reference, particularly at the implementation level, vary from the basic spirit of UN goals [20,21].

The emergence of large-scale projects, such as the SDGs, was characterized by bottom-up procedures and a strong political determination to act. Regional and local governments, as well as the rural communities that surround them, adopt sustainability goals [8,22]. The performers require consistent political support as well as dependable help with day-to-day operations. Standards and legally enforceable recommendations that reinforce prior top-down techniques are critical components of supporting problem-solving implementation [23]. Spatial planning and regional development initiatives have received renewed attention during the last several years as means of resolving land use disputes and achieving sustainable land use. The new urban agenda and particular recommendations for urban and territorial planning, as well as scientific debate, all endorse this type of spatial governance as a significant and effective approach to addressing the issues related to sustainable land use [10,24,25].

This study's purpose was to assess the effect of urbanization and land use planning on achieving the SDGs. In addition, the study was particularly motivated by three different research questions (RQ):

- RQ1: What are the different indicators of urbanization quality and their effect on the SDGs?
- RQ2: What is the relationship between integrated land use strategies and SDGs?
- RQ3: What is the effect of urbanization opportunities and land use planning on the attainment of the SDGs?

Furthermore, each research question's purpose relates to:

- RQ1: To establish the different indicators of urbanization quality and their effect on SDGs.
- RQ2: To examine the relationship between integrated land use strategies and SDGs.
- RQ3: To explore the effect of the opportunities of urbanization and land use planning on the attainment of the SDGs.

Lastly, the study will considerably contribute to the current knowledge on the process of accomplishing the SDGs through proper land use planning and urbanization. Yet, the findings will generally assist policymakers in clearly comprehending how indicators of urbanization, integrated land use strategies, urbanization opportunities, and land use planning influence SDG achievement.

## 2. Literature Review

### 2.1. Theoretical Review

A constrained framework for understanding urban growth has been provided by neoclassical economic theory in particular. It basically presupposes the highly unregulated market of land, which is associated with high rent fees for urban land, and the framework also claims that location decisions undertaken by both private households and companies are a general reflection of the objective of attaining maximum utility, primarily through balancing space needs with the available financial budget and location preferences [26]. According to neoclassical economic theory, it could be reasonable to expect that groups with relatively high incomes would prefer residing outside of the city center where there are larger construction lots available, whereas low-income households or individuals may prefer staying close to the urban area so as to reduce transportation expenses [26,27]. The neoclassical monocentric model of urban spatial structure explains urbanization growth or general spatial expansion of cities using variables that include general demand for new residential and commercial land, rising disposable incomes, improvements in transportation systems, and dropping transportation costs [26,28]. Thus, the expanding physical footprint of urban centers and their corresponding declining density are usually caused by growth in population, rising affluence, and improved individual mobility as a result of the private motor vehicle's affordability [4].

Additionally, technical perspectives support the relevance of urbanization with regard to the geographical distribution of urban land uses in addition to economic theorizing [7,29]. Some attribute the pre-industrial city's compactness to the need to make the majority of excursions by foot or other equally sluggish forms of transportation. With the advent of quicker public transit systems and the private vehicle, this restriction was removed. This reasoning led to the conclusion that transportation technology was a factor in the physical expansion of cities [30]. Other technological advancements, such as computers, mobile phones, and increased internet use, may have had a great influence on the geographical decentralization of both people and their businesses, thereby creating the conditions for more *terra firma* types of urbanization.

### 2.2. Integrated Land Uses Strategies and SDGs

An approach to allocating land for various purposes that balances economic, social, and environmental interests at the national or subnational level is known as integrated land use planning [31]. Integrated land use strategies assist decision-makers and land users in deciding on the appropriate land use mix to eventually satisfy a variety of human requirements while protecting natural resources and ecosystem services. In order to reduce conflicting interests in land between different organizations, communities, and users, as well as between traditional right holders and public or private entities, land use planning is a well-established strategy [32]. Issues including population expansion, rising competition among varied players for scarce resources, land degradation, and unsustainable urban development are often addressed via integrated land use planning [33]. Land use planning faces extra challenges from climate change in addition to those posed by other factors. Incorporating climate change into all aspects of land use planning may help reduce climatic effects such as floods, droughts, water shortages, and heat stress, as well as lessen the likelihood of these hazards endangering valued assets. Sustainable land use planning may be helpful in preventing and lessening the effects of other natural catastrophes, both climate-related and not. Land-use planning is helpful, for instance, when snow avalanches occur, as in Switzerland and Austria, where zoning is utilized to limit new construction in avalanche-prone regions [34].

In other words, local and regional governments may guarantee that communities are equipped with built-in mechanisms to confront and mitigate such changes and strengthen their resilience to large climatic shifts [35]. Compared to conventional spatial planning, integrated land use planning demands a more strategic and long-term strategy to effectively acknowledge and address the implications of climate change. The vulnerability mapping of

present and future climatic conditions should be incorporated into the knowledge base of the planning process in order to adequately account for climate change in land use planning. The most susceptible regions may be identified, and after discussion with stakeholders and agreement with the help of experts, alternate uses and spatially based adaptation methods can be chosen for those places (e.g., from biodiversity, forestry, and agricultural sectors).

Furthermore, planning tools can be used in a variety of ways to reduce climate risks, such as restricting development in hazard-prone areas, ensuring that the built environment can withstand a variety of natural disasters, preserving natural ecosystems that protect communities from hazards, promoting nature-based adaptation strategies, and informing stakeholders and decision-makers about risks and options [31,32]. Zoning, construction rules, and land use licenses are often used as precautions to prevent the exposure of important components to climatic threats [36]. Plans for afforestation and reforestation, the preservation and restoration of ecosystems, and the creation of rural or urban water retention zones are just a few examples of how integrated land use plans may affect land cover more broadly. The adoption of green, regret-free, and nature-based solutions should be prioritized wherever feasible in integrated land use planning's strategic recommendations. In this situation, a variety of co-benefits for the environment and society may be attained, such as the provision of ecosystem services, liveability and welfare, particularly in urban settings, and recreational possibilities [34].

### *2.3. Indicators of Urbanization Quality*

Rapid social and economic development has been accelerated by urbanization, but it has also brought about a number of issues, including population density, traffic congestion, resource shortages, housing shortages, loss of biodiversity, and water pollution [29,37]. Urban sustainability is becoming more and more important to people. Realizing sustainable urban development entails paying critical attention to the different aspects of environmental conservation during the process of advancing urban growth. In this case, the different processes involved in enhancing urbanization, such as infrastructural growth and improving transportation, should not have any negative impact on the environment; otherwise, it would be hard to achieve the different goals of sustainable development [38,39]. Conflicts and interactions between these aspects emerge because cities are, to a greater extent, very complex ecosystems that are usually impacted by different forces of cultural, environmental, and social-economic dimensions [18,40].

Urbanization is necessary for humanity's sustainable development, and the degree of urbanization must be determined in light of the different aspects of sustainable development [10,30]. The rate and caliber of urbanization are very essential when determining the degree of sustainable urbanization, and this should also involve blending the processes of speed and quality [33,36]. The pace as well as the general quality of the entire process of urbanization ought to be reflected by pertinent, statistically calculable indicators in order to quantitatively define the phenomenon. A comprehensive analysis of economic, environmental, and social factors is required to identify various degrees of urbanization that are sustainable [37,41,42]. In order to categorize the research on indicators of sustainable urbanization, most studies show that indicators should include economic development, the standard of basic public services, environmental development, and urban-rural heterogeneity [26,43,44]. Kotsoni et al. (2017) evaluated urbanization based on different perspectives on city size and nature of existing infrastructure, public welfare, and integration of urban and rural areas, as well as the existing economic structure [29].

Barton (2021) noted that most urban areas are largely heterotrophic systems when viewed from the standpoint of ecological as well as environmental development, and they must depend on the natural environment for life support services. The key issues are those with the quality of the air and water and how they affect human disease and death [45]. Kotsoni et al. (2017) thought that industrial emissions, the rate of green space, the availability of water per capita, the rate of green space per capita, and the volume of

total water per capita were some of the most important factors to consider in analyzing or assessing the forced interaction between urbanization and the environment [29].

Furthermore, Kleemann et al. (2017) suggested a set of metrics for measuring public welfare and living standards from the standpoint of fundamental public service quality [39]. Auzins et al. (2022) suggested traffic and accessibility signs [10,24]. Yet, indicators of mixed land use and land area were provided by Hameed (2021) [4], and an urban land use structure indicator was put out by Kleemann et al. (2017) [39]. Bibri et al. (2020) noted that based on the different perspectives of sustainable urbanization, ecological urbanization, and inclusive urban development, the majority of urbanization research indicators are normally related to economic growth, job creation, basic public service quality, environmental protection progression, urban-rural heterogeneity, as well as population growth [5,18,29].

#### 2.4. Urbanization Opportunities and Land Use

Even utilizing modern geoinformatics and statistics techniques, just watching and quantifying the phenomenon of urban land use change is insufficient to completely comprehend it. As well, an explanation of its motivating factors is also required [12,36]. Nevertheless, Stepputat and Van Voorst (2016) emphasize that there is no grand theory of urbanization or comprehensive explanatory model of urban land use change that would allow for the interpretation and justification of actual findings [18]. Conversely, the social sciences and economics have provided several ideas that point to significant causes of human activities that consume land [16].

The land use planning process includes crucial elements such as social and economic assessments. Similar to many other projects, a land use project can only be carried out if the overall benefits exceed the total expenses [29,46]. Comparing social and economic analyses may reveal areas where new policies are required. In addition, other land resources may be destroyed or degraded as a result of certain land uses. Regardless of whether the procedure is environmentally sustainable, it is likely to proceed if the economic analysis demonstrates that the usage is beneficial from the perspective of a land user [47]. Further, economic analysis should consider the damage to land resources and the ensuing decrease in production [48]. Nevertheless, a significant number of land use planning initiatives have failed in the past due to inadequate consideration of social and economic factors throughout their design and implementation. As a result, it is critical to conduct suitable socio-economic analyses at all stages of the planning process when developing land use projects [21,35].

Recent research has substantially expanded our understanding of the origins and drivers of urban growth and land consumption, two critical environmental concerns [3]. On a larger scale, it is frequently capable of explaining the intensity of urban land use change; nevertheless, forecasting its spatial patterns remains a difficult challenge [3,39]. Due to this, spatially explicit land use models have been developed that describe the rates at which urban land use change occurs over time and the locations where it is most likely to occur [49]. Concretely, Solly, Berisha, and Cotella (2021) [50] have identified five categories of explanatory variables that are widely employed in models of urban land use change:

- Biophysical characteristics: These have an effect on the suitability of land tracts for the construction of structures or infrastructural facilities and may be the reason why certain places are not included in the development.
- Social variables represent household location choices. Examples include the neighborhood's ethnic diversity or economic level, as well as the presence of open green areas.
- Accessibility attributes are referred to as "proxies" for market access in economic considerations.
- Neighborhood interactions relate to a spatial autocorrelation between newly constructed regions and already established urbanized areas that have been observed. In contrast, it is unlikely that certain potentially incompatible land uses would be situated close to one another.
- Legally defining, or differentiating, the suitability of various land parcels has potential in spatial policy and planning. These regulations may be classified as "positive



planning” if they determine whether a piece of land is suitable for a certain use or “negative planning” if their goal is to preserve present land uses.

As stated by Domingo, Palka, and Hersperger (2021), decentralized land use governance, in which many local governments have control over urban land use, is more likely to encourage urban sprawl because it increases the number of jurisdictions looking to convert land to urban uses to generate extra-budgetary income [51]. Furthermore, Metternicht (2017) revealed that exclusionary zoning laws, which are used by local governments to try to keep low-income populations out of their neighborhoods, are more likely to be tolerated in smaller towns [42]. These measures are motivated by suburban inhabitants’ wishes to safeguard their housing investments and retain their social position [52].

### *2.5. Sustainable Development in Terms of Land Use and Urbanization*

According to Dambeebo and Jalloh (2018), the transportation system is one of the primary factors affecting the environment in terms of congestion and air pollution [10]. This is particularly true when it is located close to an urban center. Similarly, Collier et al. (2020) noted that in land use planning, a new motorway or road attracts additional housing projects, businesses, and industries due to enhanced access, resulting in alterations to the land use pattern [53]. Nevertheless, Cotella et al. (2020) highlighted that the new transportation planning approach promotes noise-compatible land-use planning, which implies that urbanization is designed in such a way that air pollution is prevented [54].

Furthermore, while designing a motorway alignment, Zhang et al. (2022) prioritized the users’ safety [12]. This priority can be accomplished by following the geometric design guidelines of the applicable national or international design standards for the particular road type. Similarly, this enables individuals and commodities to move about more effectively. In addition, urban land use must satisfy both present and future urban residents’ requirements to be sustainable. Yet, residents nowadays are urging municipal leaders to modify land usage without jeopardizing future generations’ needs [5,8]. Overall, urban land use planning and sustainable development are excellent principles, but putting them into practice is a crucial challenge. These should ideally be included in a comprehensive decision framework that acts as a roadmap for daily, individual, professional, or policy choices [16,29]. Finally, the New Urban Agenda highlights land, housing, land values, tenure security, and community development as essential elements of sustainable, inclusive cities, and these contribute to the promotion of the “land for people” phenomenon, as it is presented in Figure 1.

The idea of land covers both buildings and natural resources, making the whole built and natural world a part of it. The organizational systems for land management vary greatly across nations and areas throughout the globe and are a reflection of the local legal and cultural environments. In order to better assist the execution of land policy and sound governance, institutional structures may evolve over time. The land management activities in most countries may be categorized using the three components of land policies, land information infrastructures, and the different land administration functions that help promote a sustainable level of development. This land management paradigm and its related dimensions are well depicted in Figure 2 [34].

The national strategy for supporting goals relating to economic growth, social fairness and equality, and political stability includes land policy as one of its components [46]. Land policies are usually associated with different aspects of land markets, taxes on real estate, general management and control of land use, and the provision of land for minority groups [55,56]. The paradigm of land management encompasses the different tasks or activities involved in land administration that guarantee appropriate management of rights, constraints, duties, and dangers with respect to people’s property, land, or natural resources [35,40].

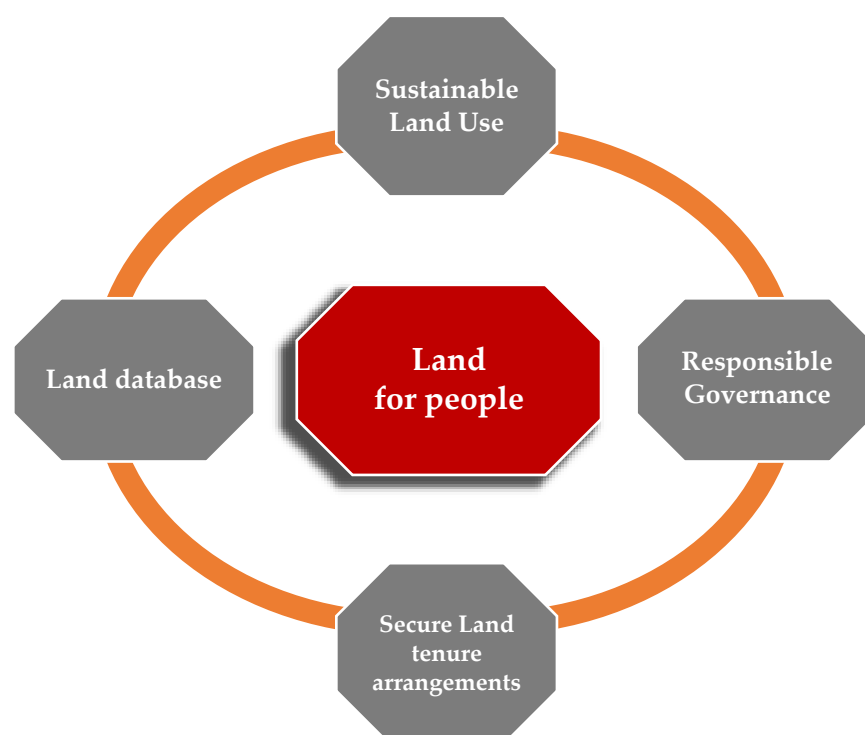


Figure 1. Aspects of Land Use Source.

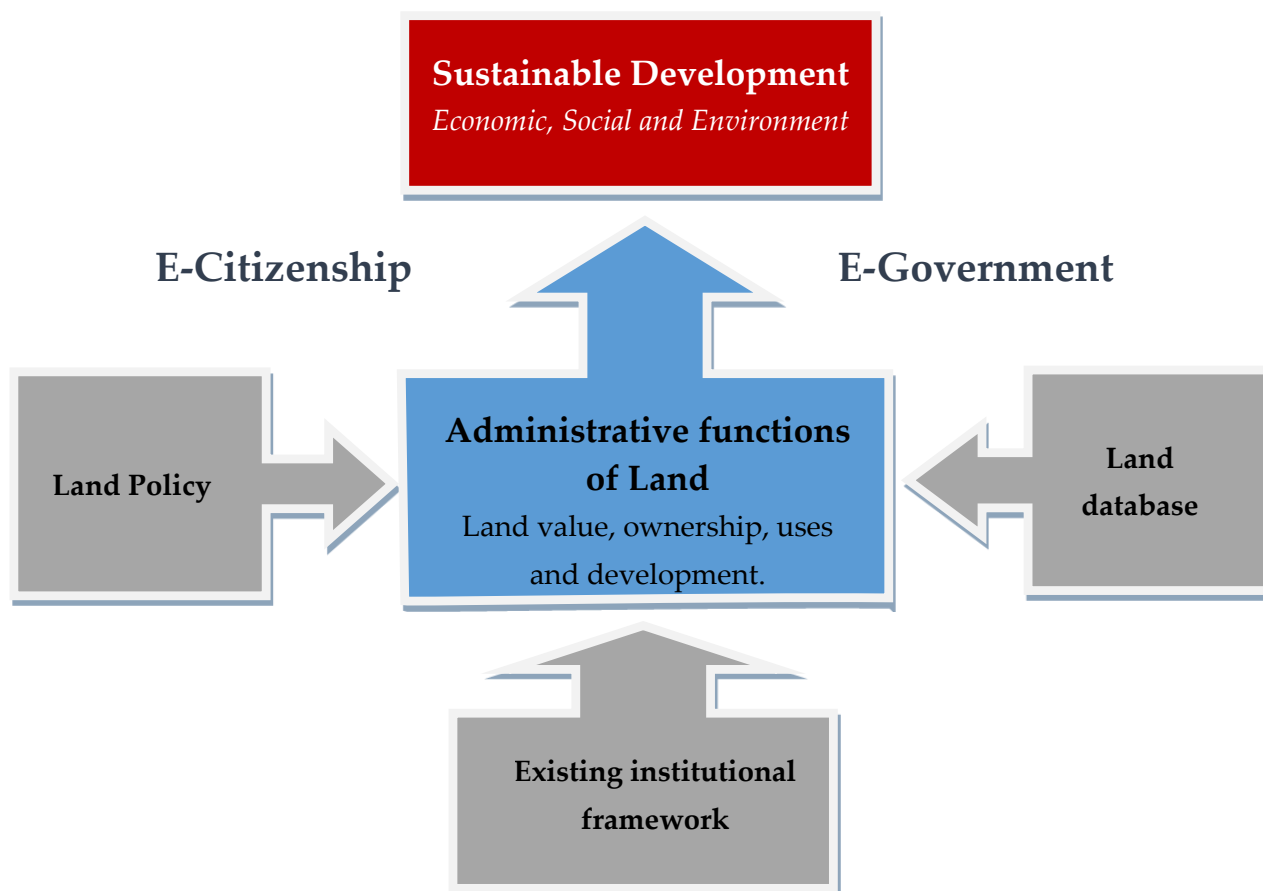


Figure 2. The land management paradigm.

Appropriate land information infrastructures serve as the foundation for and enable land administration activities. The organization of the land information area should integrate the constructed or artificial environment with the natural environment by primarily combining cadastral and topographic data that may also include topographical, environmental, and natural resource issues. The connections may be seen in the way that real conceptual, practical, and economic uses of land and assets affect their values. The potential future use of the property as defined by zoning, land use planning rules, or permit issuing procedures has an impact on land value as well [23,30].

#### 2.5.1. Spatial and Land-Use Plans in Greece

Greece has the most diverse types of spatial designs of any OECD country, with 25 distinct kinds [28]. A 2014 change that has only been partially implemented as of 2016 further complicates the situation. An overview of the structure of land-use plans before and after the reform is given in the graphics on the preceding pages. There are a variety of reasons for the very vast number of spatial designs. While some of the current plans were already legally revoked, they continue to exist since they have not been updated. Several additional situations call for distinct sorts of plans, such as unique designs for various forms of urban growth [33].

The building code is a crucial regulation that governs many facets of construction activity, as it is in the majority of nations. Except when more explicit criteria have been set by a special plan covering the region, they are typically applied to all sorts of projects. Development in towns without a town plan and outside of them is governed by two significant ordinances. Municipalities interpret and implement national legislation established by the national government [41,54,57]. These decrees have a significant influence since they cover a considerable percentage of the country's territory while sometimes having lax enforcement. The kinds of land use that may be included in the various land-use plans are defined by another significant order. Even though this rule was eliminated with the most recent reform, it remains in effect for all outdated land-use plans until they are updated [58].

Municipalities have limited incentives to align their policies with those of the national government beyond what is legally required since land-use planning is almost solely the province of the national government, leaving little potential for coordination between levels of government [59]. One ministry is in charge of all land-use policies and develops strategic plans that serve as a roadmap for the whole government to promote horizontal coordination between the various departments of the national government [58]. Strategic plans are merely guiding tools with minimal enforcement measures; thus, it is up to each ministry to decide whether or not to implement them [28].

Finally, Greece's long-term environmental sustainability has been imperiled since 1950 as a result of the crucial economy's macroeconomic variables degradation as well as social and environmental changes [60,61]. According to Chatzitheodoridis et al., Greece is distinguished by the lack of a national urban strategy and a "non-planning" heritage, which is practiced mostly at the municipal level [62]. In addition, Greece's per capita land usage is somewhat lower than the OECD average. Nonetheless, between 2000 and 2012, the country recorded large gains in both its overall share of developed land and per-person land consumption [37]. During the same period, a significant suburbanization trend emerged, with the population decreasing in urban centers but increasing rapidly in the commuter zones of metropolitan regions. Chatzitheodoridis and Kontogeorgos have highlighted the relevance of the "umbrella function" of metropolitan units in promoting inter-municipal initiatives by developing a "metropolitan vision" [63]. However, outside of major metropolitan centers, Greece is distinguished by a very low proportion of developed and forested terrain [28].

#### 2.5.2. Sustainable Development Goals of the United Nations

The United Nations (2017) noted that SDGs are easily attained across the world if only countries are able to follow the visions, guiding principles, and implementation goals



associated with sustainable development [16]. The SDGs are largely guided by a shared vision that focuses on the development of highly resilient and sustainable cities as well as enhancing human settlements to improve standards of living and consequently promote prosperity for all. The process of achieving the SDGs requires strong or well-structured urban governance as well as long-term, comprehensive urban and territorial planning [64,65].

In order to create a more sustainable world, the SDGs advocate for the need to protect, restore, and promote the appropriate use of different terrestrial ecosystems, such as the battle against land and soil depletion and loss of biodiversity. The United Nations (2017) notes that when it comes to general production as well as consumption, the SDGs encourage the promotion of very strong infrastructures along with innovation and clean production [16,29]. The SDGs, especially Goal 6, help promote sustainable management of water resources and sanitation for all people, whereas Goal 13 highlights the need to address the different aspects of climate change and its repercussions [66]. The different SDGs, which are 17 in number, are presented in Table 1.

**Table 1.** The explanation of the different 17 Sustainable Development Goals (SDGs).

Goal	Description
No Poverty	This goal seeks to eradicate all forms of poverty, with a predicted 7% worldwide poverty rate in 2030.
Zero Hunger	This goal focuses on the elimination of hunger, malnutrition, and small-scale food producers' incomes, as well as improving agricultural practices.
Good Health and Well-Being	SDG 3 focuses on decreasing maternal mortality; eliminating substance abuse; and preventing deaths arising from pollution, among others
Quality Education	This goal seeks to guarantee access to quality and free education and promoting equitable and easy access to quality early childhood development.
Gender Equality	SDG 5 focuses on the general empowerment of women or girls, promoting gender equality.
Clean Water and Sanitation	This goal seeks to address water pollution, improve water usage efficiency, and safeguard the different water-dependent ecosystems, among others.
Affordable and Clean Energy	SDG Goal 7 focuses on enhancing the utilization of renewable energy, promoting and energy efficiency, etc.
Decent Work and Economic Growth	The objectives of SDG 8 include maintaining economic growth, enhancing economic productivity, and achieving full and productive employment.
Industry, Innovation, and Infrastructure	SDG Goal 9's focus on promoting dependable infrastructure for all, improving industrialization and technology, and supporting small-scale enterprises in developing nations.
Reduced Inequalities	SDG 10 focuses on income growth; social, economic, and political inclusion; better financial market and institution regulation, etc.
Sustainable Cities and Communities	SDG 11 encourages the employment of national urban policies, and the elimination of slums to improve people's standards of living or settlement.
Responsible Consumption and Production	SDG 12 focuses on promoting sustainable consumption and production patterns as well as addressing the effects of climate change on the environment.
Climate Action	SDG Goal 13 focuses on disaster preparedness, advocating for incorporation of climate policies into different national laws, and also increasing public awareness about climate change.
Life Below Water	SDG 14 focuses on protecting the marine and coastal ecosystems and protecting the fishing industry, among others.
Life on Land	This goal focuses on preserving forests and the different land ecosystems.
Peace, Justice, and Strong Institutions	This goal focuses on promoting peace and inclusion and advocating for justice for everyone, among others.
Partnership for the Goals	This last objective strives to support the SDGs' global collaboration and cooperation.

Sustainable development goals can easily be achieved through compact design, the avoidance of unplanned urban expansion, proper natural resource management, the general reduction of different greenhouse gas emissions or air pollution, and the promotion of disaster planning or crisis management [3,18]. It is important to note that land concerns are directly related to the maintenance and general promotion of the ecological as well as

social functions of land, the avoidance of needless changes in land use, and the destruction of delicate and significant ecosystems [14]. The United Nations (2017) emphasizes that SDGs must be achieved on a national and regional level and must be bolstered by legally enforceable targets for lowering land usage [16].

Planning, multilevel coordination, and collaboration are seen as essential tools for achieving the different SDGs. Long-term sustainable development goals have been hampered by fragmented sectoral programs and independent private ventures [10,67]. This is especially evident in secondary cities, where a lack of investment and gaps in development and infrastructure plans are endangering the provision of essential infrastructure and services [28]. Sectoral and spatial plans' cooperation and harmonization improve efficiency and synergy. According to Beriatos and Papageorgiou (2010), spatial planning is most successful as a participative, flexible, and ongoing process rather than a fixed blueprint [58]. The United Nations (2017) noted that there are several planning approaches that are tailored and can collectively act as the fundamental route to sustainable urban as well as territorial planning [16]. The need for planning activities is undeniable in general, even if the function of spatial planning techniques, particularly those linked to efficacy, is viewed in the scientific literature with more skepticism [27].

## 2.6. Research Hypothesis

Based on the literature reviewed in the previous sections, three research hypotheses were formulated as below:

**Hypothesis (H1).** *The indicators of urbanization quality have a positive effect on SDGs.*

**Hypothesis (H2).** *There is a significant relationship between integrated land uses strategies and SDGs.*

**Hypothesis (H3).** *Opportunities of urbanization and land use planning have a positive influence on the attainment of SDGs.*

## 3. Methodology

### 3.1. Research Design, Target Population, and Sampling Technique

The study utilized a cross-sectional research design and was therefore quantitative. The research design facilitated the collection and analysis of quantitative data to characterize a specific phenomenon based on the current trends, occurrences, and linkages between different variables. The cross-sectional survey research approach enabled the researcher to efficiently generalize the various study findings to a broader leadership population of Kozani city in Greece (Figure 3), which provided data on the study's subject.

Regarding the target population, the study targeted the different government leaders of Greece, as it is believed that they possess extensive knowledge of issues such as land use, urban planning, urbanization quality, and attainment of the different SDGs. Leaders were selected since they represent the people and are well versed in issues of urbanization, land use planning, and the achievement of sustainable development goals. It was prudent to use leaders as the study population since most of them are selected by the people and are residents of Greece, which would provide more reliable data to draw important conclusions for the study.

The population was chosen to establish the most appropriate sample for the study. Therefore, a sample size of 384 different Greek government leaders was selected based on a study population of 10,000 different government leaders across Greece. The sample size was calculated using Yamane's (1973) formula [68,69], as presented in Equation (1).

$$n = \frac{N}{1 + Ne^2} \quad (1)$$

Calculation of the minimum sample of respondents.

where:

n—is the sample size,

N—is the population,

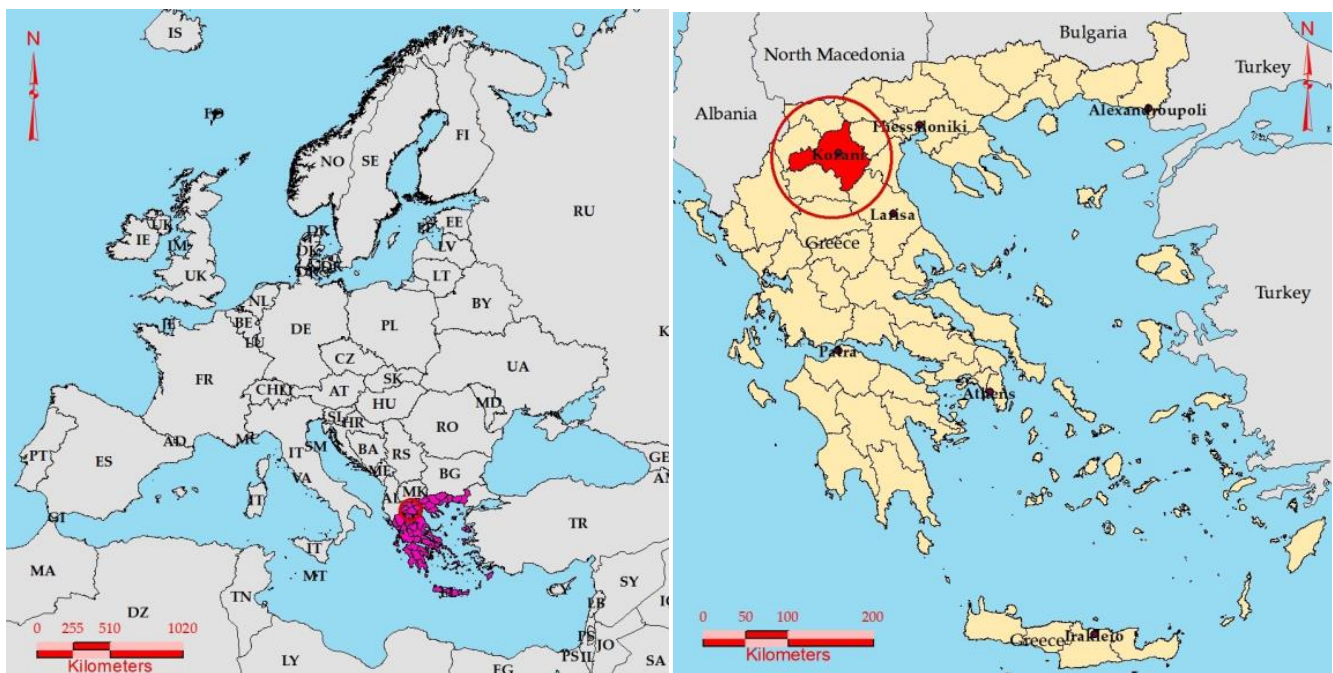
e—is the level of significance, and

1—is the constant.

Using a 5% (0.05) level of significance

$$n = \frac{10,000}{1 + 10,000(0.0025)^2} \Leftrightarrow n = 384$$

where  $n = 384$ .



Europe

Greece, Kozani—study area

**Figure 3.** Maps of Europe, Greece, and Kozani.

This study utilized stratified and simple random sample methods that fall under probability sampling approaches. In this case, the aim sample was obtained by stratified sampling, and the final sample was drawn from the strata using a stratified random sampling technique. With stratification, the researcher divided subjects into subgroups called strata based on characteristics that they shared (e.g., gender, educational attainment, leadership position). Once divided, each subgroup is randomly sampled using another probability sampling method, which in this case was simple random sampling. Stratification in this study was so important since the leadership population was heterogeneous and a simple random sample would not have provided very accurate results without using stratified sampling techniques. Notably, simple random sampling has the advantage of yielding samples that are quite representative of the population.

### 3.2. Data Collection and Analysis

The authors adopted an online questionnaire to collect data from the leaders of Kozani, Greece. A survey questionnaire is one of the most straightforward and popular methods of collecting data. This is because it covers a large number of respondents rapidly, is less expensive, and allows respondents to freely reply to difficult questions without concern about the researcher's approval or rejection. Hence, an online survey questionnaire was employed to collect the most relevant information for evaluating how urbanization and

land use planning assist in accomplishing the SDGs. For this study, well-formulated statements based on the various indicators of each independent variable as derived from the literature were used to measure each independent variable, and respondents were required to either strongly agree, agree, not sure, disagree, or strongly disagree with these statements. On the other hand, to measure the dependent variable, very specific statements relating to achieving the SDGs were developed and measured using a nominal scale. In this case, respondents would easily choose the best alternative among the presented aspects of the SDGs. Generally, the study was based on three major independent variables: indicators of urbanization quality, integrated land use strategies, and opportunities for urbanization and land use planning. Each of the independent variables was assessed based on well-constrained statements, and responses were based on a Likert scale of 1–5. 1—strongly disagree (SD), 2 is disagree (D), 3 is not sure, 4 is agree (A), and 5 is strongly Agree (SA). From each variable, a statement measurement on a Likert scale of 1–5 was picked and cross-tabulated with the different aspects of the SDGs. This would then help to provide the relationship between a particular independent variable and the dependent variable (achieving the SDGs). The description and measurement of the variables in this study are presented in Table 2.

Furthermore, the quantitative data collected from the selected study participants was coded and transferred to SPS for analysis. The results were presented in tables, and their interpretation was based on frequencies and percentages. The link between the research variables was established using Pearson’s rank correlation test. Regression analysis was also utilized to ascertain how much urbanization and land use planning contribute to the accomplishment of the SDGs. In this case, a multiple regression model was employed (Equation (2)) to obtain the various predicted values [70–74].

**Table 2.** Variables, guiding question, and measurement.

Variable	Guiding Question	Measurement Statement	Measurement Scale
Dependent variable			
Achieving SDGs	What is the effect of urbanization and Land Use Planning on achieving SDGs.	<ol style="list-style-type: none"> <li>1. Sustainable industrialization and improved technology</li> <li>2. Reduced poverty in communities</li> <li>3. Peace, equal justice and strong institutions</li> <li>4. Strengthened climate action, and improved urban environment</li> <li>5. Empowerment of women and girls to achieve gender equality</li> <li>6. Enhanced shared prosperity of cities and regions</li> <li>7. Others</li> </ol>	Nominal scale
Independent Variables			
Indicators of urbanization quality,	RQ1: What are the different indicators of urbanization quality and their effect on SDGs?	<ol style="list-style-type: none"> <li>1. Unplanned urbanization may lead to deforestation, or habitat loss, which may reduce biodiversity and change the ranges and interactions of many species.</li> <li>2. Sustainable urbanization entails more than just converting agricultural land and forests without making any changes to them into cities.</li> <li>3. Urbanization may be harmful to sustainable development if it is not properly controlled</li> <li>4. Sustainable urbanization is one of the answers to the problem of the world’s population growth if it is done with vision and dedication.</li> </ol>	Likert scale

Table 2. Cont.

Variable	Guiding Question	Measurement Statement	Measurement Scale
Integrated Land use strategies,	RQ2: What is the relationship between integrated land uses strategies and SDGs?	<ol style="list-style-type: none"> <li>1. Land use planning is mostly a local effort though some nations employ guiding land use plans created at the regional or inter-municipal level</li> <li>2. The global approach to land management relies on effective governance structures.</li> <li>3. Addressing sustainability challenges, such as poverty reduction, and sustainable energy greatly depends on proper land usage.</li> <li>4. Land use planning promotes sustainable agriculture, which is also the first critical step towards achieving zero hunger.</li> <li>5. Planning for land use may make sure that resources are utilized effectively, meeting people's demands while protecting their future resource availability.</li> </ol>	Likert scale for each statement
Opportunities of urbanization, and land use planning	RQ3: What is the effect of urbanization opportunities and land use planning on the attainment of SDGs?	<ol style="list-style-type: none"> <li>1. Land use planning promotes the quality use of land to accommodate changing human requirements while maintaining the long-term socioeconomic uses of the land.</li> <li>2. Integrated urban planning is important in improving waste and water management, public transportation, and effective management of land</li> <li>3. Land use planning guides on proper construction and maintenance of a city's infrastructure</li> <li>4. Urban planning has an impact on infrastructure, transportation systems, and the layout of residential, commercial, and industrial districts, among other things</li> </ol>	Likert scale for each statement

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \quad (2)$$

where:

Y—represents the achievement of SDGs,

$\beta_0$ —is the constant coefficient of intercept,

$X_1$ —represents the indicators of urbanization quality,

$X_2$ —represent the integrated land use strategies,

$X_3$ —represents the opportunities for urbanization and land use planning, and

$\varepsilon$ —represents the error term in the multiple regression model.

The hypothesis of the study was tested, and the mode of accepting or rejecting the stated hypothesis was performed at the 0.05 level of significance.

Regarding ethical considerations, the researcher ensured that the Kozani local authorities were willing to participate in the study by obtaining their informed consent. In addition to this, the respondents' data was treated as confidential, personal, and private. The respondents were allowed to interpret the different opinion questions to answer queries, making it easier to get comprehensive replies to certain inquiries.

#### 4. Results

This section presents the results obtained after analyzing the data collected from the selected respondents.

##### 4.1. Demographic Characteristics

The results about the demographic characteristics of the selected respondents that participated in the study are presented in Table 3. The majority of the selected leaders



(61.4%) were male, with the remaining 38.5% representing females. Additionally, the majority of the respondents (56.8%) were between the ages of 31 and 40, with just 6% over the age of 50. The majority of the selected leaders (68.2%) had been in leadership for 5–10 years, with only 11.7% have been in leadership for less than 5 years.

**Table 3.** Showing participants' demographic information.

	Characteristic	Frequency	Percentage (%)
Gender	Male	236	61.4
	Female	148	38.5
Age bracket	Below 30 years	68	17.7
	31–40 years	218	56.8
	41–50 years	75	19.5
	Above 50 years	23	6.0
Years spent in leadership	Below 5 years	45	11.7
	5–10 years	262	68.2
	Above 10 years	77	20.1
	Total	384	100

Source: Authors' own work (2023).

#### 4.2. Descriptive Analysis

The study sought to establish the effect of urbanization and land use planning on the achievement of the SDGs, and the findings on this variable are presented in Table 4. As shown by the results, 72.8% of the respondents agreed that unplanned urbanization may lead to deforestation or habitat loss, reducing biodiversity and changing the ranges and interactions of many species. In addition, the majority of the respondents (61.3%) agreed that sustainable urbanization entails more than just converting agricultural land and forests without making any changes to them into cities. Furthermore, 55.8% of the respondents believed that if urbanization is not properly controlled, it might be harmful to sustainable development. Lastly, more than half of the respondents (68.2%) agreed that, if done with vision and determination, sustainable urbanization is one of the answers to the problem of the world's population growth.

**Table 4.** Opinions on indicators of urbanization quality and their effect on SDGs.

Statement	SD %	D %	NS %	A %	SA %
Unplanned urbanization may lead to deforestation, or habitat loss, which may reduce biodiversity and change the ranges and interactions of many species.	7.2	10.4	3.5	72.8	6.1
Sustainable urbanization entails more than just converting agricultural land and forests without making any changes to them into cities.	3.4	2.7	7.8	61.3	24.7
Urbanization may be harmful to sustainable development if it is not properly controlled.	11.8	3.3	9.4	55.8	11.6
Sustainable urbanization is one of the answers to the problem of the world's population growth if it is done with vision and dedication.	10.3	4.7	1.5	68.2	15.3

Key: SD = strongly disagree, D = disagree, NS = not sure, A = agree, and SA = strongly agree; Source: authors' own work (2023).

The study also sought to explore the relationship between integrated land use strategies and SDGs, and the results are presented in Table 5. The results reveal that 73.6% of the respondents agreed that land use planning is mostly a local endeavor, though some nations employ guiding land use plans developed at the regional or inter-municipal level. Most of the respondents (55.3%) agreed that the global approach to land management relies on effective governance structures. Furthermore, 51.1% of the participants strongly agreed that addressing sustainability challenges, such as poverty reduction and sustainable energy, greatly depends on proper land usage. It was also agreed by 60.2% of the respondents

that land use planning promotes sustainable agriculture, which is also the first crucial step towards achieving zero hunger. Finally, 64.2% agreed that planning for land use may make sure that resources are utilized effectively, meeting people's demands while protecting their future resource availability.

**Table 5.** Results on the relationship between integrated land use strategies and SDGs.

Statement	SD %	D %	NS %	A %	SA %
Land use planning is mostly a local effort though some nations employ guiding land use plans created at the regional or inter-municipal level.	4.7	6.7	5.4	73.6	9.6
The global approach to land management relies on effective governance structures.	7.9	8.6	15.4	55.3	12.8
Addressing sustainability challenges, such as poverty reduction, and sustainable energy, greatly depends on proper land usage.	6.9	6.6	5.2	30.2	51.1
Land use planning promotes sustainable agriculture, which is also the first critical step towards achieving zero hunger.	3.8	4.3	7.9	60.2	23.8
Planning for land use may make sure that resources are utilized effectively, meeting people's demands while protecting their future resource availability.	3.9	6.1	4.7	64.2	21.1

Key: SD = strongly disagree, D = disagree, NS = not sure, A = agree, and SA = strongly agree; Source: authors' own work (2023).

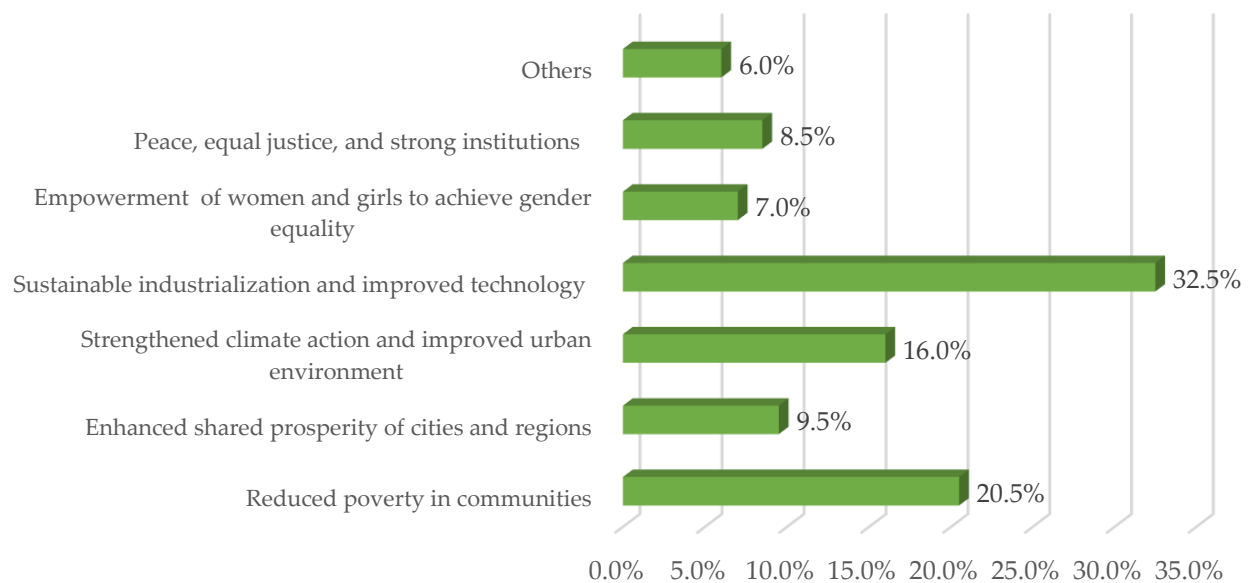
Correspondingly, the study investigated the effect of the opportunities of urbanization or land use planning on accomplishing the SDGs, and the results are presented in Table 6. In particular, 58.3% of the respondents agreed that land use planning promotes the quality use of land to accommodate changing human needs while preserving the land's long-term socioeconomic uses. It was acknowledged that 63.7% agreed that integrated urban planning is important in improving waste and water management, public transportation, and the effective management of land. Similarly, 61.0% of the respondents strongly agreed that land use planning guides the proper construction and maintenance of a city's infrastructure. Finally, it was revealed by a majority of the respondents (57.6%) that urban planning has an impact on infrastructure, transportation systems, and the layout of residential, commercial, and industrial districts, among other things.

**Table 6.** Showing the effect of opportunities of urbanization and land use planning on the attainment of SDGs.

Statement	SD %	D %	NS %	A %	SA %
Land use planning promotes the quality use of land to accommodate changing human requirements while maintaining the long-term socioeconomic uses of the land.	8.1	6.4	7.8	58.3	19.4
Integrated urban planning is important for improving waste and water management, public transportation, and the effective management of land.	3.0	6.2	5.6	63.7	21.5
Land use planning guides the proper construction and maintenance of a city's infrastructure.	1.9	14.7	6.8	15.6	61.0
Urban planning has an impact on infrastructure, transportation systems, and the layout of residential, commercial, and industrial districts, among other things.	1.6	8.7	10.8	57.6	21.3

Key: SD = strongly disagree, D = disagree, NS = not sure, A = agree, and SA = strongly agree. Source: authors' own work (2023).

Finally, the respondents provided their opinions on the different aspects of the SDGs, whose results are presented in Figure 4. The results in Figure 4 indicate that SDGs are significantly more concerned with sustainable industrialization and improved technology (32.5%), followed by reduced poverty in communities (20.5%), strengthened climate action, and an improved urban environment (16%). Other participants (6%) highlighted aspects of SDGs, such as early childhood development, building resilience in agricultural practices, and enhancing resource efficiency and productive employment.



**Figure 4.** Aspects of SDGs.

#### 4.3. Correlation Analysis

A correlation analysis was conducted to determine the relationship between study variables, and the results are displayed in Table 7. The findings indicate that indices of urbanization quality have a positive correlation with SDG achievement ( $r = 0.526$ ), which is significant at 0.05. Hence, indicators such as population growth, urban leadership competency, and the quality of urban planning all have a significant influence on the possibility of meeting the SDGs. Further, integrated land use strategies showed a positive correlation with the achievement of the SDGs ( $r = 0.734$ ), which was statistically significant at 0.05. Further, at a significance level of 0.05, there was a strong association or correlation between opportunities for urbanization and land use planning and the SDGs' accomplishment ( $r = 0.531$ ).

**Table 7.** Cross-tabulation of aspects of urbanization, land use planning, and SDGs.

	Indicators of Urbanization Quality	Integrated Land Use Strategies	Opportunities of Urbanization and Land Use Planning	Sustainable Development Goals
Indicators of urbanization quality	1			
Integrated land use strategies	0.631 *	1		
Opportunities of urbanization and land use planning	0.913 *	0.708 *	1	
Sustainable Development Goals (dep.)	0.526 *	0.734 *	0.531 *	1
	0.00	0.00	0.00	0.00

\* Represent statistical significance at a 5% level of significance.

#### 4.4. Results of Regression Analysis

A regression analysis was applied to determine the level to which indicators of urbanization quality, integrated land use strategies, urbanization opportunities, and land use planning predict the SDGs' success. The result of 0.791 of the multiple correlation coefficient (R) demonstrated a positive association between the three independent variables and the achievement of the SDGs. In addition, the value of R-Square confirms that indicators of urbanization quality, integrated land use strategies, urbanization opportunities, and land use planning result in an 83.6% shift in SDG achievement, as shown in Table 8.

**Table 8.** Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.791	0.836	0.808	0.36421

Predictors: (constant); indicators of urbanization quality, integrated land use strategies, opportunities for urbanization, and land use planning.

The one-way ANOVA helped to find out whether the independent variables in this study were great or major predictors of the dependent variable (attainment of SDGs) or whether the linear regression model was well fitted with the data. As it is presented in Table 9, the findings  $F(3, 197) = 38.241$ ,  $p < 0.05$ , indicate that the model and data are sufficiently matched.

**Table 9.** ANOVA analysis.

Model	R	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.137	3	17.102	38.241	0.017
	Residual	4.102	381	0.046		
	Total	46.238	384			

Dependent Variable: SDGs; Predictors: (constant), indicators of urbanization quality, integrated land use strategies, opportunities of urbanization, and land use planning.

In addition, the different unstandardized coefficients of the model were examined to determine the effect of urbanization and land use planning on the attainment of the SDGs. As it is presented in Table 10, the beta coefficient of indicators of urbanization quality is 0.341, indicating that a unit change in indicators of urbanization quality results in a 34.1% change in SDGs. Furthermore, the beta coefficient of integrated land use strategies is 0.234, implying that any change in integrated land use strategies may lead to a 23.4% change in SDGs. Consequently, a unit change in urbanization and land use planning opportunities would result in a 26.1% shift in environmental sustainability.

**Table 10.** Regression coefficients.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.836	0.196		2.438	0.026
Indicators of urbanization quality	0.341	0.103	0.397	3.736	0.002
Integrated Land use strategies	0.234	0.042	0.213	3.195	0.004
Opportunities of urbanization and land use planning	0.261	0.051	0.282	3.511	0.013

Dependent Variable: Achieving of SDGs.

In summary, the indicator of urbanization quality's  $p$ -value (0.002) was less than the significance level (0.05); hence, we accept hypothesis H1 that the indicators of urbanization quality have a positive effect on achieving the SDGs. Furthermore, the beta coefficient for integrated land use strategies was 0.23 and the  $p$ -value was 0.004, so we accept hypothesis H2 that there is a significant relationship between integrated land use strategies and SDGs. Yet, the  $p$ -value of opportunities for urbanization and land use planning was 0.013, indicating a substantial relationship between urbanization and land use planning opportunities and the SDGs. As a result, we accept Hypothesis H3, which states that opportunities for urbanization and land use planning have a positive influence on the attainment of the SDGs.

## 5. Discussion

This research examined the impact of urbanization and land use planning on achieving the SDGs, with a major focus on Greece. The results show that metrics of urbanization

quality have a favorable impact on the SDGs. It was shown that integrated land use plans and the SDGs have a significant link. The research also indicated that urbanization possibilities and land-use plans have a significant impact on SDG achievement. It is also important to emphasize that the best land use choices are decided by weighing environmental, economic, and social factors [8,29]. While the literature has numerous theoretical land-use plan models, few studies focus on their actual application and distinctive difficulties in diverse locations, notably in Greece. Implementing an integrated land-use plan in a poor nation may be difficult due to a lack of data, political will, stakeholder engagement, and financial and human resources, according to the research. Previous land-use planning projects and studies addressed these issues in innovative ways, including the use of simpler models that needed less data, the importance of data collection, and the involvement of decision-makers throughout the process [66,75].

The study clearly shows that integrated land use strategies are important in achieving the SDGs. According to the literature, important components of the land use planning process include economic and social considerations. A land use project, similar to many others, can only be completed if the net benefits outweigh the net costs [29,42]. Combining social and economic evaluations may highlight areas that need new policy. In addition, some land uses may result in the destruction or degradation of other land resources. Whether or not the practice is environmentally sustainable, it is likely to move on if the economic analysis shows that it is advantageous from the viewpoint of a land user [43]. Economic analysis should also take into account the destruction of land resources and the subsequent decline in productivity [44]. This research emphasizes the need for strong governance institutions for a global approach to land management. Decentralization may be seen as a critical component in achieving the broader objective of sustainable development in this setting. This argument is particularly compelling when it comes to land use management and decision-making. Comprehensive planning, which merges policies and land-use regulations into a unified planning document that encompasses the whole jurisdiction, is another concept connected to integrated land-use management [5,54]. The presentation of political goals, objectives, problems, and preconditions should then be used to justify land use planning and more detailed land use laws. This also applies to public participation, which should be used to raise awareness of the importance of planning laws and enable communication between the government and the public on the management of natural resources and the overall urban and rural environment [35,76]. Moreover, a monitoring system is essential to making decisions on informal urban or rural growth in relation to overall land policies, such as via continuing updating of the large-scale topographic map base and suitable enforcement methods [7,10].

Moreover, communities with declining populations, or “shrinking towns”, have economies that collapse due to concerns with unemployment and poverty, an aging workforce, vacant buildings, and the loss of historic sites. Similarly, Murray (2019) said that in order to compete with other jurisdictions for large economic development efforts such as new industrial facilities, office parks, or big-box regional retailers, local businesses and communities may suffer [30]. Furthermore, planners and supporters of smart growth frequently advocate for moderately high population density because of its alleged benefits, which include a smaller footprint of developed land, preservation of agricultural land and open space, more walking and less driving, support for public transportation, and more opportunities for social interaction [59]. The pressures placed on forest ecosystems near increasing urban areas cause problems for natural resource management. For outdoor recreation, city dwellers relocate to exurban areas. Another concern is the safety of people when they come into contact with wild animals, hazardous plants, and other outdoor risks. Urbanization trends may be harmful to the wellbeing of lower socioeconomic groups. Lower-income people may be disenfranchised as a result of “gentrification”, or the movement of urban neighborhoods toward higher wages and more expensive housing [2,53]. The number of families that must use well water and septic systems grows as a consequence of land use rules that promote growth beyond the limits of water and sewage infrastructure.



Importantly, increased septic system use increases the risk of sewage backflow and seepage into water delivery systems, raising the possibility of long-term, undiscovered drinking water supply contamination. Finally, communities that want to protect agricultural land have a number of choices for controlling land use, which may help them achieve the SDGs by ensuring economic survival, food security, or maintaining rural beauty [4,39,46].

## 6. Conclusions

This study assessed the effect of urbanization as well as land use planning with regard to achieving sustainable development goals, with a focus on Greece. The study showed that indicators of urbanization quality, integrated land use strategies, and urbanization opportunities have a positive influence on the attainment of the different SDGs. The study showed that indicators of urbanization quality are very key to achieving different SDGs. This indicates that sustainable urbanization entails more than just converting agricultural land and forests without making any changes to them into cities, and it is equally one of the answers to the problem of the world's population growth if it is done with vision and dedication. The study clearly shows that integrated land use strategies are important in achieving the SDGs. In this case, land use planning is mostly a local effort, though some nations employ guiding land use plans created at the regional or inter-municipal level. The creation of a successful networking system may significantly increase, speed up, and optimize the process of information gathering, selection, and sharing while preventing redundancy and overlap. There is no way to create a comprehensive, sustainable land use plan for an area. At most, a regional plan may provide a broad overview of what has to be accomplished on a national level. Hence, each nation will need to customize its sustainable development plan in light of its unique issues, limitations, and comparative advantages. Regional plans must establish goals, pinpoint pertinent initiatives, evaluate how policies will affect the environment, look into ways to gather resources, and improve and promote engagement from all parties involved. Projects for land use planning shall not be promoted or carried out without expense. Hence, creating new funding sources to augment the national budget allocations should get top priority. New strategies for development, and by extension, for land use and management, are required by the difficult but generally accepted notion of sustainable land use planning. In this regard, it is necessary to manage the land and its associated resources from fresh angles. In order to accomplish sustainable land use planning development, policies, laws, objectives, and goals should be founded on local realities, customs, and natural resource management techniques. Prior to implementation, such policies and regulations should be evaluated for their effects on the environment and the socioeconomic system.

### 6.1. Recommendations

In order to promote proper land-use management, there is a need to incorporate the three domains of land policy, land information management, and land-use monitoring or enforcement, which could also help in achieving the SDGs. A system such as this, which incorporates monitoring and enforcement mechanisms, should promote sustainable growth while also giving people the fundamental tools for stopping and regulating unofficial urban expansion.

The lessons learned demonstrate that a radical departure from previous policies is required in order to adopt a new holistic approach to land use planning and management that is thorough, inclusive, and ecologically sustainable. This can greatly help the government achieve different SDGs in the shortest time possible.

Professionals with the necessary training who can function in the multisectoral setting of integrated natural resource management should be utilized in urbanization and land use planning. This can greatly enhance the process of attaining the SDGs.

In order to ensure that development is more comprehensive and global than local, a plan for an urban area should also take neighboring communities and land uses into

account. This improves local social and economic activity while causing less environmental harm and achieving the SDGs.

There is a need to involve the population in different decision-making processes that aim at enhancing urbanization and land use. The population plays a key role in achieving proper land use and a high level of urbanization; hence, involving it in decision-making helps to achieve the SDGs.

In order to promote intra- and intergenerational fairness, sustainable land use planning integrates ecological, socioeconomic, political, and ethical concepts into the management of land for productive and other purposes.

In order to achieve equality and justice in regard to land use planning, it is also important to gather, analyze, and distribute timely and accurate data, as well as apply cutting-edge land assessment and evaluation technologies to provide solid scientific knowledge for optimal decision support when developing and executing policies and strategies to help in land use planning.

### 6.2. Limitations of the Study

There were methodological limitations in this study whereby, despite focusing on the entire country of Greece, the data was specifically collected from Kozani, and this would have affected the generalizability of the results. However, to address this limitation, we used government leaders as a sample size and then assumed that these represented different areas of Greece and not only Kozani.

### 6.3. Areas for Future Research

The findings suggest that future land development will be decided upon and governed by land use planning and policies. However, there is still much work to be done when it comes to debating informal urban expansion in Europe. Some European countries, particularly those in the south and east, are struggling in this area. As a consequence, future research should emphasize the various informal factors influencing overall sustainable development in Europe.

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