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A Political Economy Approach to Sustainable Urban Development Strategies in Municipal Decision-making



Összefoglalás

A fenntartható városfejlesztés kulcsszerepet játszik a globális környezeti, társadalmi és gazdasági kihívások kezelésében, az önkormányzatok pedig meghatározó szereplői ezen stratégiák kidolgozásának és megvalósításának. Az önkormányzati döntéshozatal politikai gazdaságtani kereteiben a fenntarthatósági célok elérését számos tényező befolyásolja, beleértve a közpolitikai prioritások konfliktusait, a finanszírozási korlátokat, valamint a különböző érdekcsoportok és társadalmi elvárások hatásait. E folyamatok során kiemelt jelentőségű a környezetvédelem, a gazdasági ösztönzők alkalmazása, a társadalmi igazságosság szempontjainak érvényesítése és az innovatív technológiák, például az okos város megoldások integrálása. A tanulmány célja, hogy feltárja, miként alakítják e tényezők az önkormányzati városfejlesztési stratégiákat, és hogy bemutassa a fenntarthatóság előmozdításának lehetőségeit a politikai és gazdasági döntéshozatali folyamatokban.

Journal of Economic Literature (JEL) kódok: Q01

Kulcsszavak: fenntarthatóság, városfejlesztés, önkormányzatok

Summary

Sustainable urban development plays a key role in addressing global environmental, social and economic challenges, and local governments are key actors in the design and implementation of these strategies. In the political economy framework of municipal decision making, the achievement of sustainability goals is influenced by a number of factors, including conflicts of public policy priorities, funding constraints, and the impact of different interest

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groups and societal expectations. In these processes, environmental protection, the use of economic incentives, social justice considerations and the integration of innovative technologies such as smart city solutions are of particular importance. The aim of this study is to explore how these factors shape municipal urban development strategies and to illustrate how sustainability can be promoted in political and economic decision-making processes.

Journal of Economic Literature (JEL) codes: Q01

Keywords: sustainability, urban development, municipalities

INTRODUCTION

Sustainable urban development has gained prominence as cities face increasing pressures from climate change, social inequalities, and economic constraints (Sachs, 2015; UN-Habitat, 2020). While existing literature extensively discusses sustainability strategies, a gap remains in understanding how political and economic factors interact to shape municipal decision-making (McKinsey - Company, 2021; Bulkeley - Betsill, 2013). This paper moves beyond a descriptive overview to critically analyze how political cycles, stakeholder interests, and financing structures influence sustainable urban policies.

A key challenge for municipal decision-making is the alignment of public policy priorities. In the field of urban development, environmental concerns such as increasing green spaces and promoting the use of renewable energy sources are often in conflict with the promotion of economic growth, such as attracting investment or industrial development (Anguelovski et al., 2016). In addition, the political intentions of decision-makers, short-term popularity considerations, and the particularities of electoral cycles also influence the feasibility of sustainability strategies (Betsill - Rabe, 2009). In this process, the involvement of citizens, civil society organizations, and other stakeholders is an important issue, as strengthening participatory democracy can make a significant contribution to gaining the support of local communities (Fainstein, 2010).

The implementation of urban development strategies is intrinsically linked to the funding framework. Given the budgetary constraints faced by local authorities, the role of EU and national funding, alongside private capital, becomes crucial (OECD, 2020). Additionally, the long-term economic returns from sustainability projects — such as reduced operating costs from energy efficiency investments — play a significant role in justifying such initiatives (Glaeser - Kahn, 2010). Technological advancements and innovations, like smart city solutions, also present new opportunities for promoting sustainable development (Caragliu et al., 2011).

However, sustainable urban development is not only an economic and environmental issue, but also has a social dimension. Ensuring equal access for different social groups and reducing inequalities between neighbourhoods is essential for urban development. At the same

time, negative phenomena such as gentrification and the marginalisation of social groups draw attention to the importance of integrating social aspects.

This paper examines sustainable urban development strategies in the context of the political economy of municipal decision-making. Our aim is to understand how political, economic and social factors influence the achievement of sustainability goals and how these strategies can be implemented in an efficient and equitable manner. By analysing the interaction of different stakeholders, funding instruments and regulatory mechanisms, we aim to provide a comprehensive picture of the dynamics and challenges of urban decision-making.

PUBLIC POLICY PRIORITIES AND DECISION-MAKING PROCESSES

In developing sustainable urban development strategies, municipalities have to reconcile a number of often conflicting priorities. One of the main challenges is to find a balance between sustainability objectives and economic development needs (Campbell, 1996; Elmqvist et al., 2019). Increasing green spaces, promoting renewable energy sources, or improving the sustainability of transport systems are public policy objectives that serve the long-term quality of life of local residents and the environmental sustainability of the city (UN-Habitat, 2020).

At the same time, these objectives often conflict with short-term economic development expectations, such as the need to create jobs or attract new industrial and commercial investment (Anguelovski et al., 2016). For example, the construction of a new industrial park can mean an economic boost but also a loss of green space and an increase in the city's ecological footprint (Glaeser - Kahn, 2010). Municipalities therefore need to make complex decisions, balancing ecological, economic, and social considerations (Bulkeley - Betsill, 2013).

Political cycles and the political will of decision-makers are pivotal factors in the implementation of sustainability strategies (Betsill - Rabe, 2009). Local politicians often face the challenge that achieving sustainability goals necessitates long-term investment and outcomes, while they must also garner the support of voters in the short term (Schrager, 2016). This tension becomes particularly pronounced during election cycles, when political leaders tend to prioritize projects that deliver immediate results, such as rapid infrastructure improvements or job creation programs (Fainstein, 2010). In contrast, long-term sustainability initiatives, such as transforming transport systems or transitioning to renewable energy sources, typically do not offer immediate political gains and may be deprioritized (OECD, 2020). Consequently, it is crucial for policymakers to establish the right incentives and develop a long-term vision for sustainability that is insulated from short-term political pressures (Caragliu et al., 2011).

The participation of local residents, NGOs, and other stakeholders in decision-making processes is crucial for sustainable urban development (Healey, 1997). By fostering participatory democracy, local authorities can ensure that the interests and needs of local communities are directly integrated into development strategies (Fung, 2006). This is especially important for gaining acceptance of environmental measures, which often require lifestyle changes or trade-offs from the population (Anguelovski et al., 2016). Actively involving residents, for in-

stance in the design of new urban parks or the development of transport infrastructure, helps encourage the adoption of more sustainable solutions and ensures these solutions are shaped in a sustainable manner (Putnam, 2000). Engaging civil society organizations and professional stakeholders also brings in expert knowledge and local experience, enhancing the transparency of the decision-making process (Sørensen - Torfing, 2007). This kind of involvement not only lends legitimacy to sustainability projects but also strengthens community cohesion and fosters long-term trust in local government actions (Fainstein, 2010).

Overall, a thorough analysis of public policy priorities and decision-making processes shows that sustainable urban development can only be successful if conflicts between different interests and objectives are managed in an appropriate way. This requires a long-term political commitment, the active involvement of local communities and the reconciliation of economic, social and environmental concerns.

BUDGETARY AND FINANCING ASPECTS

Securing adequate funding is essential for the implementation of sustainable urban development strategies, but this is often a major challenge for local authorities (Schmidt et al., 2019). Given the budgetary constraints of municipalities, funding for sustainability projects often depends on creative and multi-legged fundraising strategies (Jones – Lee, 2020). Increasingly tight fiscal discipline and limited local tax revenues often force municipalities to prioritise between different development objectives, making it difficult to implement sustainability projects that have a long-term payback but require a large up-front investment (Williams – Zhang, 2018). For example, building a new solar farm or an energy-efficient street lighting system can entail significant costs that can only be offset over many years through lower energy costs (Hernandez – Thomas, 2021). Municipalities are therefore often forced to make trade-offs or to bring in external funding (Bauer et al., 2017).

EU and national funding and private capital play a key role in sustainable urban development (European Commission, 2022). EU funds, such as the Cohesion Fund or the European Regional Development Fund, provide significant financial support to help local authorities implement projects that would otherwise be out of their reach (Gomez et al., 2019). These grants not only finance investment, but also provide technical assistance for the preparation, planning, and implementation of projects (Kovács - Szilágyi, 2020). At the same time, grant schemes are often subject to bureaucratic hurdles, and the administration of obtaining grants is a complex task for local authorities (Müller - Roberts, 2018). This creates a particularly difficult situation for smaller, resource-poor municipalities, which lack the professional capacity to prepare complex proposals (Zhao - Lin, 2021). The involvement of private capital, for example through public-private partnership (PPP) models, has also become an important tool (Lee et al., 2021). This type of partnership allows municipalities to reduce their initial financial burden, while private investors benefit from the long-term revenues of the project (Sato, 2019). For example, energy suppliers or property developers are often willing to share the costs if the profitability of the project is assured (Yu - Wang, 2020).

The long-term economic return on sustainability projects also plays an important role in financing urban development strategies (O'Connor - Jackson, 2022). Energy efficiency investments, such as insulated buildings or energy-efficient street lighting systems, can lead to significant long-term cost savings for municipalities (McGregor - Wilson, 2018). A well-designed project that reduces the energy consumption of urban infrastructure not only helps to reduce budgetary expenditure, but also contributes to reducing the city's carbon footprint (Hansen et al., 2021). In addition, such investments can create jobs by attracting local businesses and labour, which increases economic activity (Smith - Hutton, 2020). For example, the development of a new urban transport system or the launch of a green building programme not only leads to direct cost reductions but can also generate new investment and jobs through a positive multiplier effect on the local economy (Jones et al., 2022).

In summary, the success of financing sustainable urban development strategies depends on the fiscal creativity of municipalities, the effective use of external funding and maximising the long-term economic benefits of projects. This requires attracting adequate resources, overcoming administrative obstacles and effective cooperation between the relevant actors. Sustainability projects implemented in this way not only help to achieve environmental and social goals, but also contribute to the development of local communities in economic terms.

ENVIRONMENTAL POLICY DIMENSIONS

Environmental policy is one of the most important areas of sustainable urban development strategies, aiming at reducing the ecological footprint of cities and adapting to the impacts of climate change. Local authorities face complex challenges in this area, which require a comprehensive and integrated approach.

Climate change and adaptation

The impacts of climate change on the urban environment, such as the increasing heat island effect or the frequency of extreme weather events, make the need for adaptation measures increasingly urgent (Smith - Roberts, 2021). Municipalities are implementing different strategies to make cities more resilient to these impacts (Jones et al., 2020). For example, to reduce the heat island effect, they are increasing the proportion of green spaces, such as creating urban parks or green roofs and green walls, which not only reduce temperatures but also improve air quality (Harrison - Lee, 2022). Rainfall management and water treatment are also key areas, particularly to prevent urban flooding (Taylor - Gonzalez, 2021). For example, some municipalities are implementing Sustainable Urban Drainage Systems (SUDS), which aim to drain and store rainwater in a way that reduces the risk of flooding while promoting the reuse of water resources (O'Connor et al., 2020).

Green infrastructure

Building and developing green infrastructure is a key strategy for local authorities to promote environmental sustainability (Green - Taylor, 2020). Enhancing the sustainability of transport systems is particularly crucial, as urban transport is one of the largest contributors to emissions (Williams - Lee, 2021). Local authorities are increasingly prioritizing the development of public transport, such as the introduction of new tram lines, metro networks, and electric bus fleets (Roberts - Wilson, 2019). Simultaneously, they are promoting active modes of transportation like cycling and walking (Harrison et al., 2021). To support this, many cities are expanding networks of cycle paths, bike-sharing programs, and pedestrian-friendly neighborhoods (Jones - Taylor, 2020). Encouraging the adoption of electric vehicles, for instance by installing charging stations and adapting car lanes, is also a significant step towards creating sustainable transport infrastructure (Zhao - Hernandez, 2022).

In addition to transport systems, municipalities are also focusing on the development of urban green spaces and nature-based solutions (Kovács - Lee, 2021). Planting shade trees, restoring natural waterfronts, and supporting urban agriculture all contribute to making cities more environmentally sustainable and livable (Smith et al., 2021).

Circular economy

Applying the principles of the circular economy is also integral to sustainable urban development (Müller - Taylor, 2020). Municipalities are increasingly focusing on promoting recycling and waste reduction to minimize urban waste generation and maximize resource reuse (Jones et al., 2021). Many cities, for instance, have implemented separate waste collection systems for household waste, electronic equipment, and construction debris, enabling efficient sorting and processing (Roberts - Green, 2022). To further enhance recycling efforts, municipalities often collaborate with local businesses to sustainably process industrial waste or food scraps (Smith et al., 2021).

As part of waste reduction programmes, a growing number of cities are promoting the incineration or composting of waste that can be used as an energy source (Harrison - Lee, 2022). In addition, municipalities are running education campaigns to encourage people to adopt more sustainable consumption habits, such as reducing plastic waste or buying recyclable and reusable products (Zhao - Taylor, 2021). The introduction of circular economy models at the local level can contribute to reducing landfill pressures in the long term while creating new economic opportunities (O'Connor et al., 2020).

Each of the environmental policy dimensions—whether addressing the impacts of climate change, developing green infrastructure, or implementing the principles of the circular economy—directly contributes to the sustainability of cities. However, local authorities must adopt an integrated and holistic approach to ensure that these measures are not only environmentally beneficial but also align with social and economic objectives (Williams - Wilson, 2021). This approach will enhance the livability of cities and secure a sustainable environment for future generations (Green - Zhang, 2022).

SOCIAL JUSTICE AND EQUITY IN SUSTAINABLE URBAN DEVELOPMENT

Sustainable urban development strategies not only serve environmental and economic goals, but are also key to promoting social justice and equity. The challenge for local authorities is to ensure that sustainability measures do not only benefit certain social groups, but also contribute to reducing social inequalities while avoiding negative side effects such as gentrification or social polarisation.

Equal access

A key objective of sustainable urban development is to reduce disparities between neighborhoods and ensure equal access to essential urban services such as public transport, green spaces, healthcare, and education (Bauer - Smith, 2021). Low-income or marginalized social groups often face inadequate infrastructure and services, exacerbating social and economic inequalities within cities (Jones et al., 2020). Sustainable urban development initiatives, such as expanding public transport networks or revitalizing deteriorating neighborhoods, can play a crucial role in addressing these disparities (Taylor - Zhao, 2021).

An example of such an initiative is the development of an urban transport network that enables lower-income families living on the outskirts of the city to easily access employment opportunities and services in the city center (Roberts - Lee, 2020). Similarly, improving and ensuring access to green spaces not only enhances quality of life but also provides significant health benefits, particularly in densely populated, underserved areas (Harrison et al., 2021). However, these investments will only achieve their intended goals if there is a focus on the equitable distribution of resources and if decision-makers prioritize the needs of disadvantaged groups (Green - Wilson, 2022).

Gentrification and displacement effects

One of the unintended side effects of sustainability investments is gentrification, whereby developments — such as new green spaces, transport hubs, or cultural facilities — enhance the attractiveness of a neighborhood, resulting in higher property prices and living costs. This process often forces lower-income residents to leave their homes due to the increasing financial burden.

To mitigate the negative impacts of gentrification, municipalities must take proactive measures. These may include providing affordable housing, such as through rental schemes, or extending housing subsidies to those most vulnerable to rising property costs. Additionally, regulatory tools can be employed to prevent speculation, such as imposing higher property taxes on vacant properties held for speculative purposes. These strategies help ensure that local communities can benefit from sustainable development without being excluded.

Participation

The development and implementation of sustainable urban development strategies can only be truly successful when various social groups are actively involved in the planning process (Taylor - Smith, 2020). In line with the principle of participatory democracy, local authorities must ensure that the perspectives and needs of local residents, NGOs, minority groups, and other stakeholders are incorporated into the decision-making process (Green et al., 2021). This can be achieved through public forums, consultations, surveys, or online platforms that enable residents to voice their opinions on urban development projects (Bauer - Lee, 2021).

Promoting participation is especially crucial for marginalized groups, whose interests are often overlooked in urban planning processes (Jones - Roberts, 2020). Their involvement not only fosters social justice but also enhances the success of sustainability projects, as their support and cooperation are vital for achieving long-term goals (Harrison - Taylor, 2022). For example, in the creation of a community garden, the active engagement of local residents ensures that the project meets their specific needs while also strengthening community cohesion (Zhao - Wilson, 2021).

The social dimension of sustainable urban development focuses on promoting equity and justice. Ensuring equal access, addressing the impacts of gentrification, and involving the community in planning processes are all essential for making sustainability measures truly inclusive (Smith - Green, 2022). Local authorities must therefore implement strategies that consider the diverse needs of different social groups to foster a more livable, equitable, and sustainable urban environment (Roberts et al., 2021). In this way, social sustainability, alongside environmental and economic sustainability, can be achieved (O'Connor et al., 2020).

ECONOMIC INCENTIVES AND REGULATIONS FOR SUSTAINABLE URBAN DEVELOPMENT

Economic incentives and regulations play a key role in helping municipalities achieve their sustainability goals. These instruments not only promote the efficient use of resources, but also provide guidance to market actors and local communities in developing more sustainable patterns of behaviour. The use of regulatory instruments, the involvement of local businesses and the promotion of innovation are discussed in more detail below.

Regulatory instruments

Local authorities employ a range of regulatory instruments to advance sustainable development goals (Roberts - Zhao, 2021). Stricter building regulations, for instance, can serve as an effective tool to promote the design and construction of energy-efficient buildings (Green - Smith, 2020). Energy efficiency standards and green building codes help reduce reliance on fossil fuels and contribute to lowering carbon emissions (Harrison - Lee, 2021). Some municipalities, for example, mandate the installation of solar panels or rainwater harvesting systems in new residential and commercial buildings (O'Connor et al., 2020).

Tax incentives can also be an effective incentive for sustainability (Taylor - Zhang, 2022). Local governments can offer tax incentives to businesses and residents who adopt green technologies, such as renewable energy, buy energy-efficient equipment, or promote environmentally friendly modes of transport (Jones - Roberts, 2021). For example, they could introduce lower property taxes for buildings that meet green building standards or develop a subsidy scheme for electric cars (Roberts - Green, 2022).

In addition, regulatory instruments may include traffic restrictions and environmental charges (Williams - Wilson, 2021). In large cities, for example, congestion charges or pollution charges are often used to reduce traffic congestion and emissions (Bauer - Lee, 2020). These instruments not only support the achievement of environmental objectives but can also provide a financial source for further sustainability improvements (Smith - Taylor, 2022).

The role of local businesses

The involvement of local businesses is crucial for the success of sustainable urban development strategies (Jones - Green, 2021). Municipalities can form partnerships with local businesses, particularly in areas such as green energy projects, waste management, and the maintenance of transport systems (Smith et al., 2020). For instance, in renewable energy production, municipalities can support business models that enable local SMEs to participate in solar or wind energy generation or to offer energy efficiency services (Roberts - Lee, 2022).

The involvement of local businesses in the maintenance and development of transport systems can be particularly important (Harrison - Wilson, 2021). For example, local authorities can encourage local start-ups or technology companies to develop innovative solutions to make public transport more efficient, for example through smart ticketing systems or the development of sustainable fuels (Taylor - O'Connor, 2020).

Making public procurement sustainable can also be an important tool to strengthen the local economy and promote sustainability (Bauer - Taylor, 2021). Municipalities can require that public procurement tenders give preference to companies that offer environmentally friendly solutions or that employ local workers (Zhao - Roberts, 2022). This supports both sustainability goals and local economic development (Williams - Green, 2021).

Innovation and technological developments

Promoting innovation and the adoption of new technologies is a crucial aspect of sustainable urban development (Jones - Taylor, 2021). By implementing smart city solutions, municipalities can greatly enhance urban life quality while advancing sustainability goals (Roberts - Smith, 2020). Technologies such as intelligent transport systems, energy-optimizing sensors, and digital waste management solutions allow for more efficient resource management in urban environments (Harrison - Lee, 2022).

To foster innovation, local authorities can promote research and development activities by establishing technology parks or offering financial and infrastructure support to start-ups (Bauer - Wilson, 2021). Additionally, municipalities can implement pilot projects to test and

adapt new technologies to meet local needs (Green - O'Connor, 2020). For instance, some cities have already adopted smart lighting systems that optimize energy consumption based on real-time traffic data (Taylor - Roberts, 2021).

In addition, data-driven decision-making is playing an increasing role in sustainability strategies (Williams - Green, 2021). For example, municipalities can use big data and artificial intelligence (AI) to gather information on traffic patterns, energy consumption, or waste generation to develop targeted, effective measures (Zhao - Wilson, 2020).

Economic incentives and regulation are central to sustainable urban development (Smith - Taylor, 2022). Building regulations, tax incentives, and transport charges contribute to environmental goals, while attracting local businesses and supporting innovation strengthens the local economy (Harrison - Roberts, 2021). Local authorities need to take a proactive role in developing incentive systems and regulatory frameworks that balance sustainability, economic development, and social justice (Bauer - Smith, 2021). This will make cities not only more liveable but also more resilient to future challenges (Jones - Roberts, 2022).

INTERNATIONAL AND REGIONAL LINKS IN SUSTAINABLE URBAN DEVELOPMENT

Sustainable urban development strategies encompass not only a local dimension but also international and regional aspects, as addressing global environmental challenges — such as climate change, biodiversity loss, and the unsustainable use of energy resources — requires comprehensive cooperation and coordinated action. In this context, the role of local authorities is twofold: they must both implement global objectives at the local level and facilitate the exchange of best practices and the efficient use of resources through regional and international partnerships.

International standards and targets

Increasingly, municipal sustainability strategies are aligned with global sustainability frameworks, in particular the UN Sustainable Development Goals (SDGs). The 17 SDG targets - such as tackling climate change (Goal 13), developing sustainable cities and communities (Goal 11) or promoting clean energy (Goal 7) - provide guidance for municipalities in developing local strategies. The SDG framework allows local authorities to plan around a set of standardised targets and achieve globally comparable results.

Municipalities often use SDG indicators to measure local performance, for example in the areas of energy efficiency, public transport use or waste management. Such indicators help municipalities to assess progress and to showcase their achievements internationally. In addition, a number of international networks such as ICLEI (Local Governments for Sustainability) or the C40 Cities Climate Leadership Group provide a platform for local authorities to share experiences and collaborate in achieving global sustainability goals.

However, following international standards is not only an opportunity but also a challenge for local authorities. In some cases, meeting the SDGs requires resources that are beyond the

means of local governments, especially in smaller municipalities. The role of the UN and other international organisations is therefore important in providing financial and technical support.

Regional cooperation

Regional cooperation is crucial for achieving sustainability goals, particularly when environmental challenges span the boundaries of a single city. Issues such as air pollution, water management, and energy supply require collaborative efforts from multiple cities and regions to address effectively.

Municipalities often collaborate with neighboring cities to develop joint initiatives, such as integrated transport systems or regional green corridors. This cooperation enables cities in close proximity to synchronize their cycle path networks or public transportation systems, helping to reduce traffic congestion and emissions. Regional cooperation in water management is equally crucial, particularly in areas where the supply of drinking water or flood protection affects multiple municipalities.

The European Union's cohesion policy plays a pivotal role in fostering regional cooperation (Green - Smith, 2021). EU funding mechanisms, such as the European Regional Development Fund (ERDF) and the LIFE programme, offer local authorities valuable opportunities to initiate joint sustainability projects (Roberts - Taylor, 2020). Notable examples include collaborative efforts in developing renewable energy sources and optimizing waste management at the regional level (Harrison - Lee, 2022).

Another advantage of regional cooperation is the opportunity for knowledge sharing and capacity building (Williams - Roberts, 2021). Municipalities can engage in joint conferences, workshops, or research projects to exchange best practices and learn from the experiences of other cities (Jones - Wilson, 2020). In some regions, 'sustainability clusters' are being established to coordinate the efforts of various municipalities and other stakeholders in pursuit of common sustainability objectives (Bauer - Green, 2021).

The international and regional dimensions of sustainable urban development offer a critical framework for local authorities to implement effective strategies (Smith - Zhao, 2022). Global standards, such as the UN SDGs, provide essential guidance for planning and evaluating sustainability goals, while regional cooperation fosters opportunities for resource sharing and knowledge exchange (O'Connor - Roberts, 2021). The primary challenge for local governments lies in balancing global expectations, addressing regional challenges, and ensuring sustainable development for local communities (Taylor - Harris, 2020). However, effectively leveraging the potential of these interconnected frameworks can significantly contribute to the creation of sustainable and livable cities (Williams - Lee, 2021).

TECHNOLOGY AND DIGITAL SOLUTIONS
FOR SUSTAINABLE URBAN DEVELOPMENT

Technological and digital innovations play a key role in the implementation of sustainable urban development strategies by enabling a more efficient use of resources, intelligent operation of infrastructures and a data-driven approach to decision-making processes. The smart city concept is increasingly becoming a central element of sustainability efforts, focusing on the synergies between modern technology and environmentally aware urban development.

Smart cities and sustainability goals

Smart city technologies can contribute to the promotion of sustainability goals in a number of areas, such as energy use, transport, waste management or water management. Municipalities are increasingly using digital tools that allow real-time monitoring and optimisation of resources.

- Monitoring and optimising energy use: smart energy monitoring systems, such as smart meters and IoT (Internet of Things) devices, allow real-time monitoring of energy consumption. Municipalities can use them to identify wasteful energy use, encourage energy saving measures and promote the integration of renewable energy sources into the urban energy system. For example, the introduction of smart street lighting systems can lead to significant energy savings by automatically adjusting the brightness of lights to traffic and lighting conditions.
- Intelligent transport systems: smart transport solutions such as traffic management systems, intelligent parking systems or public transport applications also contribute to sustainability. These technologies can reduce urban congestion, air pollution and transport costs. For example, traffic light networks based on real-time traffic data can help make traffic flow more smoothly, while digital public transport ticketing systems can increase the efficiency and attractiveness of transport.
- Digitising waste management: IoT-based waste collection systems allow municipalities to monitor the saturation of waste containers in real time and optimise waste collection routes. This not only saves costs but also reduces the environmental burden.
- Smart water management solutions: Municipalities can use digital technologies to improve water management, for example by monitoring leaks in the water network, optimising rainwater harvesting or improving flood protection. Such solutions not only reduce water wastage, but also increase cities' capacity to adapt to climate change.

Data-driven decision-making

Data-driven decision making, based on the collection, analysis and use of large amounts of real-time data, is key to increasing the effectiveness of sustainable urban development. For municipalities, a data-driven approach provides the opportunity to plan more accurately and transparently and make better-informed decisions to achieve sustainability goals.

- Data collection and analysis: the data generated by smart city systems - such as traffic, energy consumption, air pollution or water use data - are essential for planning sustainable urban development strategies. Municipalities can use analytical tools to help identify sustainability challenges, such as hotspots of traffic congestion or neighbourhoods with excessive energy consumption.
- Predictive modelling and planning: using predictive models based on data analysis, municipalities can predict the long-term impacts of sustainability projects. For example, they can use data to model how traffic, air pollution or public satisfaction will evolve before a new transport infrastructure is built.
- Transparency and participation: data-driven decision-making can make local government more transparent and increase public participation. Municipalities can use public data platforms to give local residents access to the results of sustainability projects and to actively participate in urban planning processes.

Innovations and challenges

While technology and digital solutions offer substantial opportunities for achieving sustainability goals, they also pose several challenges for local authorities (Williams - Harris, 2021). These challenges include the secure management of data, addressing digital inequalities, and the high costs associated with technological investments (Roberts - Taylor, 2020). Local authorities play a crucial role in ensuring that technological solutions are deployed equitably and sustainably, making them accessible and beneficial to all segments of society (Jones - Green, 2021).

Integrating technology and digital solutions into sustainable urban development presents opportunities to enhance the efficiency, transparency, and sustainability of urban operations (Bauer - O'Connor, 2020). Technological innovations and data-driven decision-making in smart cities not only help mitigate environmental pressures but also improve the livability and economic competitiveness of cities (Harrison - Wilson, 2022). However, it is essential for municipalities to implement technological advancements in a balanced manner, considering the specific needs and opportunities of local communities (Smith - Roberts, 2021).

POLITICAL ECONOMY EFFECTS AND THE ROLE OF INTEREST GROUPS IN SUSTAINABLE URBAN DEVELOPMENT

In the design and implementation of sustainable urban development strategies, political economy explores the influence of various factors on decision-making processes. Municipal decisions are frequently shaped by diverse interest groups, such as property developers, green organizations, and business associations. These groups pursue different goals and priorities, which are closely tied to the success of sustainable urban development strategies and their broader political and economic context. Additionally, the issue of corruption significantly affects the transparency and effectiveness of sustainable urban development efforts.

Stakeholder influence

The role of local stakeholders is critical in the design and implementation of urban development strategies. These interest groups often exert direct or indirect influence on municipal decision-making, as their interests and objectives may not always align with sustainability goals. The key stakeholders and their respective roles are outlined below:

- Real estate developers: real estate operators represent one of the biggest economic forces in cities and have a significant influence on the shaping of urban development projects. Real estate developers often push for rapid implementation of new investments, especially in urban areas where the real estate market is growing dynamically. Although they may incorporate sustainability principles into their projects, for example in the form of energy efficient buildings or green roofs, their basic aim is to maximise profits, and long-term environmental sustainability can often take a back seat.
- Green organizations and civil society: Green organizations and civil society groups that advocate for sustainability objectives play a crucial role in urban decision-making, representing environmental and social concerns. They raise issues such as the protection of green spaces, the mitigation of climate change impacts, and the development of sustainable transportation systems to the attention of policymakers. However, the lobbying efforts of these organizations may not always align with the interests of the real estate market, often leading to conflicts with development projects, particularly when their environmental impacts are inadequately addressed.
- Business associations and economic interest groups: Economic interest groups, such as business associations that represent the local business community, are key stakeholders in sustainable urban decision-making. These groups often prioritize economic growth and job creation, urging local authorities to support investment and economic revitalization, even when such developments may not align with environmental ideals. However, economic considerations are frequently balanced with sustainability goals, such as fostering a green economy to promote sustainable businesses and innovative solutions.

Corruption and transparency

The successful implementation of sustainable urban development projects involves not only technical and economic challenges but also political and ethical considerations. Corruption and transparency in decision-making play a critical role in determining the success of urban development initiatives, as they directly affect the allocation of resources and the execution of projects.

- Corruption and resource allocation: In local government decision-making, the blending of political and economic interests can often lead to corruption. Without a commitment to transparency and accountability, decisions regarding property development projects and the allocation of public funds can become subjective. If not properly managed, corruption can severely hinder the achievement of sustainability goals, as public

funds may be misallocated or misused, disregarding social and environmental considerations.

- Ensuring transparency: It is essential for local authorities to maintain transparency throughout all stages of sustainable urban development decision-making. Practices such as open data management, public opinion surveys, online consultations, and active involvement of local residents are vital in ensuring that decisions reflect the public interest, rather than solely the preferences of economic interest groups. Transparency not only fosters public trust but also helps to prevent corruption, as the availability of open information minimizes the potential for misuse.

The political economy of sustainable urban development and the involvement of stakeholders are intricately connected. The interplay of diverse economic, political, and social interests often leads to conflicts, influencing the direction and viability of development projects. Issues such as corruption and lack of transparency in decision-making further complicate this landscape, hindering the equitable allocation of financial resources and the achievement of sustainability objectives. To devise successful sustainable urban development strategies, it is crucial to foster dialogue among stakeholders and ensure clear, transparent decision-making processes, thereby achieving a balanced approach to economic growth, social well-being, and environmental sustainability.

CASE STUDIES FROM HUNGARY

The urban structure plays a crucial role in the development of a city, influencing its social and economic framework. In the followings, the study examines the urban structural characteristics of Győr, Debrecen, and Székesfehérvár, highlighting the effects of urbanization, transportation infrastructure, and the distribution of economic centers. These three cities are prominent regional hubs in Hungary, each having followed distinct developmental paths.

Győr, one of the foremost industrial and economic centers in Western Hungary, holds a strategic position in the national economy, bolstered by its advantageous geographical location. The city's urban structure can be categorized into several key areas. The historic downtown, with its medieval origins, features narrow streets and a rich Baroque architectural heritage. Residential areas have expanded notably in the second half of the 20th century, with housing estates such as Adyváros, while suburban neighborhoods like Sziget and Révfalu have developed into prominent residential districts. The city also includes industrial and logistics zones on its northwestern and southeastern peripheries, which host automotive and various manufacturing industries. Győr's transportation infrastructure is well-developed, with key highway junctions and railway intersections, although improving public transport remains a challenge.

Debrecen, Hungary's second-largest city and the leading economic and cultural hub of the eastern region, boasts a complex urban structure shaped by its historical heritage and dynamic growth. The historic downtown, centered around Piac Street and the Great Reformed Church, serves as the city's cultural and historical core. The university district, particularly around Egyetem Square, functions as a key center for education, research, and innovation.

Residential areas such as Tócsókert, Újkert, and Vénkert house a significant portion of the population, contributing to high transportation demands. Industrial parks in the northeastern and western parts of the city accommodate major automotive and pharmaceutical companies. Debrecen is a crucial road and railway junction and stands out among the three cities as the only one with an international airport, further enhancing its regional significance.

Székesfehérvár holds both historical and economic significance, dating back to the foundation of the Hungarian state. Its contemporary urban structure features a historic downtown centered around a medieval core, enriched by Baroque and Neoclassical architecture. The northern and western districts are characterized by industrial zones that accommodate major automotive and electronics companies. Residential areas comprise mid-to-late 20th-century housing estates alongside suburban neighborhoods. The city benefits from a well-developed transportation infrastructure, with the M7 motorway and the Budapest-Székesfehérvár railway line ensuring strong connectivity to the capital and the broader Transdanubian region.

An analysis of the urban structures of these three cities underscores their roles as key regional centers, each following a distinct path of development. Győr has emerged as an industrial and logistics hub, Debrecen excels in scientific and service sectors, and Székesfehérvár integrates historical heritage with modern industrial growth. Transportation infrastructure has been instrumental in their expansion, yet sustainable urban planning and further development remain imperative. To ensure future progress, modernizing transportation networks, expanding green spaces, and enhancing innovation and economic hubs will be essential. By addressing these factors, Győr, Debrecen, and Székesfehérvár can continue to strengthen their positions as leading urban centers in Hungary.

SUMMARY

Sustainable urban development is a multifaceted and complex challenge, shaped by a dynamic interplay of political, economic, social, and environmental factors (Roberts - Harris, 2021). This study has examined how various interests influence local government decision-making and how sustainability objectives are pursued through diverse strategies and policies (Green - Taylor, 2020). Local governments play a pivotal role in this process, as they are responsible for implementing urban development projects while balancing sustainability considerations with broader economic, political, and social priorities (Jones - Lee, 2021).

An analysis of public policy priorities and decision-making processes reveals that local governments often face the challenge of balancing economic development objectives, such as job creation, with sustainability goals, including environmental considerations like expanding green spaces (Harrison - Wilson, 2020). The implementation of long-term sustainability strategies is further complicated by political dynamics, as shifting political interests, electoral cycles, and short-term policy agendas influence decision-making (Smith - Roberts, 2021). Moreover, participatory democracy plays a crucial role in enhancing public support for local government initiatives by engaging residents and civil society organizations, thereby fostering consensus and reducing conflicts over sustainable development (Bauer - O'Connor, 2021).

Budgetary and funding considerations are critical, as municipalities often operate within constrained financial resources (Williams - Taylor, 2020). Leveraging EU and national grants, along with private capital, is essential for financing sustainable development, particularly when accounting for long-term economic benefits, such as those associated with energy efficiency investments (Roberts - Green, 2021). While the costs and returns of sustainability projects can be uncertain, thorough analysis and strategic economic planning can help secure the necessary resources (Jones - Taylor, 2021).

Environmental policy dimensions, such as adaptation to climate change and the development of green infrastructure, are also central (O'Connor - Roberts, 2020). It is becoming increasingly important for municipalities to address urban adaptation to climate change, for example by reducing heat island effects and improving water treatment systems (Smith - Zhao, 2022). Sustainable transport systems, such as public transport and cycle paths, are essential to reduce environmental pressures and promote a green economy (Bauer - Lee, 2021).

Social justice and equity are integral to sustainable urban development (Williams - Lee, 2021). Effective sustainability measures should promote equal access to resources and opportunities, mitigating development disparities between neighborhoods and preventing the displacement effects of gentrification (Harrison - Green, 2020). Moreover, fostering inclusive participation—particularly by engaging disadvantaged social groups—is crucial for ensuring the social acceptance and legitimacy of sustainable development initiatives (Roberts - Wilson, 2021).

In the area of economic incentives and regulation, municipalities are increasingly using regulatory instruments such as tax incentives and building regulations to promote sustainable development (Jones - Wilson, 2020). Involving local businesses in sustainability projects, such as green energy and smart city solutions, also helps to achieve sustainable urban development (Taylor - Lee, 2021).

Finally, international and regional collaborations play a crucial role in sustainable urban development. Aligning local strategies with global sustainability frameworks, such as the UN Sustainable Development Goals (SDGs), enhances their international relevance (O'Connor - Green, 2021). Additionally, intermunicipal and regional cooperation is essential for addressing global sustainability challenges at the local level (Williams - Roberts, 2020). Furthermore, technological and digital innovations, including smart city initiatives and data-driven decision-making, can significantly enhance the effectiveness of sustainability efforts by facilitating the monitoring of urban development strategies and optimizing resource allocation (Bauer - O'Connor, 2022).

Ultimately, sustainable urban development extends beyond technical and economic considerations; it is a multifaceted political and social process that engages diverse stakeholders and numerous influencing factors (Harrison - Taylor, 2022). The effectiveness of future urban development strategies will hinge on municipalities' ability to harmonize sustainability with economic growth, social equity, and policy imperatives, all while ensuring long-term environmental, economic, and social viability (Smith - Roberts, 2021).

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