Proceedings of ICMRED 2024 Workshop: Identifying the Explanatory Variables of Public Debt and Its Importance on The Economy
DOI: 10.54254/2754-1169/96/2024MUR0118

Sustainable Development Strategies in Urban Planning

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Abstract: With the acceleration of urbanization, the strategy of sustainable development in urban planning has become increasingly important. There have been several non-environmental-friendly issues emerging in urban areas. For example, the construction industry is one of the key economic development activities in Thailand. An increase of the construction sector also contributed to the increasing of environmental pollution. This is a typical environmental issue among industrial areas of the urban. To resolve these kinds of issues, people should prioritize developing sustainable cities. This includes implementing green building standards, enhancing energy efficiency, and promoting renewable energy sources. Sustainable city planning also involves preserving natural habitats, promoting biodiversity, and reducing carbon emissions through initiatives like public transportation systems and bike-friendly infrastructure. This paper analyzes the concept of sustainable development and its application in urban planning. By exploring the sustainable development strategy in urban planning, people can promote the balanced development of economy, society, and environment, and realize the long-term sustainable development goal of cities.

Keywords: sustainability, urban planning, economy, society, environment

1. Introduction

Cities have played a key role in human civilization. As the pivot of human civilization, the rapid progress of the city drives the development of the region and even the whole world. With rapid urbanization and population growth occurring at an unprecedented rate, however, numerical of social and environmental issues have emerged. Among these challenges, growing inequalities and unemployment are a widespread feature in cities, which became more apparent during the Covid-19 pandemic [1]. Moreover, despite occupying less than 3% of the earth's surface, cities consume 75% of the world's energy and are responsible for 80% of global GHG emissions [2,3]. Therefore, the need for sustainable urban planning strategies has become increasingly urgent. Sustainable development focuses on meeting the needs of the present without compromising the ability of future generations to meet their own needs.

The concept of sustainable development in city planning is built on the recognition that cities are complex systems with interdependent social, economic, and environmental components. As such, a holistic approach to city planning is essential in order to achieve long-term sustainability. By considering the interactions between land use, transportation, housing, infrastructure, and natural resources, cities can develop integrated strategies to promote sustainability and resilience. In 2015, the United Nations (UN) Sustainable Development Summit unanimously adopted, “Transforming

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Our World: The 2030 Agenda for Sustainable Development," a joint document aimed at comprehensively addressing global economic, social, and environmental development challenges. This document seeks to eradicate poverty and build a dignified life for people around the world while preserving the integrity of the biosphere and expanding the benefits of sustainable development [4,5]. The agenda proposes 17 Sustainable Development Goals (SDGs) in areas such as economic growth, education, health, social welfare, employment opportunities, climate change, and the long-term sustainability of nature [6]. The SDG proposed by the United Nations can precisely depict the need for sustainable urban development.

One key aspect of sustainable urban development is the implementation of green infrastructure. Green spaces, such as parks, wetlands, and urban forests, not only provide environmental benefits such as improved air and water quality but also contribute to the health and well-being of city residents. Sustainable transportation systems, including public transit, cycling infrastructure, and pedestrian-friendly design, can reduce dependency on cars, lower greenhouse gas emissions, and improve urban mobility. Another critical component of sustainable development is energy-efficient building design. Additionally, promoting affordable housing, improving access to public services, and fostering community engagement is essential for creating inclusive and equitable urban environments.

Despite the numerous benefits of sustainable urban development, cities face a range of challenges in implementing sustainable strategies. These challenges include balancing economic growth with environmental protection, integrating sustainability considerations into existing urban plans and policies, and overcoming resistance to change from various stakeholders. However, there are also numerous opportunities for cities to embrace sustainability, including leveraging innovative technologies, engaging with local communities, and collaborating with other cities to share best practices. This paper will further explore the concept of sustainable development in city planning, highlighting the importance of integrating environmental, social, and economic considerations to create thriving and sustainable cities. By examining case studies from around the world and presenting recommendations for sustainable urban development practices. This paper aims to inspire and inform cities as they strive to build a more sustainable future for all residents.

2. Sustainable Development Strategy In Urban Planning

The sustainable development strategy in urban planning has always been a hot topic in academic circles and practitioners. With the acceleration of the global urbanization process and the increasing pressure on resources and the environment, urban sustainable development has become an important goal of urban planning. This paper will analyze the strategic content and implementation measures of urban sustainable development from the aspects of urban land use planning, transportation planning and environmental protection planning.

2.1. Urban Land Use Planning

Urban land use planning is the basis of urban sustainable development. Rational land use planning can improve the utilization efficiency of land resources and reduce the damage of land development to the environment. One of the key strategies is to promote densification within cities and reduce the constant expansion of the urban fringe. In addition, urban land use planning should also take into account the protection and restoration of natural ecosystems, planning green areas and wetland reserves, and improving the ecological carrying capacity of cities.

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2.2. Transportation Planning

Transportation is an important factor in urban sustainable development. Proper transportation planning can reduce traffic congestion and air pollution, improve transportation efficiency and reduce carbon emissions. It is one of the important strategies to implement public transport priority policy, optimize public transport lines and services, and improve the convenience and comfort of public transport. At the same time, non-motorized traffic should be encouraged, bicycle lanes and pedestrian streets should be built, and dependence on motor vehicles should be reduced. In addition, the use of intelligent transportation technology to improve the management efficiency of transportation systems and reduce congestion and emissions is an important means to promote sustainable urban development.

2.3. Environmental Protection Planning

Environmental protection is the core of sustainable urban development. Environmental pollution and resource consumption are the main obstacles to urban sustainable development. Therefore, a variety of environmental protection measures should be designed in urban planning, including the construction of sewage treatment plants, improving the efficiency of solid waste treatment, and promoting clean energy and energy-saving technologies. In addition, urban planning needs to take into account the rational use and conservation of natural resources and formulate corresponding policies to protect water resources, soil resources, and biodiversity.

3. Case Analysis

The Chinese city of Shenzhen is a success story. Shenzhen has been implementing the special economic zone policy since 1979 and has made great achievements in economic development. In recent years, Shenzhen has adjusted its urban planning and put forward the concepts of "livable city" and "ecological city". Shenzhen pays attention to ecological protection and urban renewal in land use planning and carries out urban village transformation and greenway construction, which effectively improves land use efficiency and urban ecological environment quality. In terms of transportation planning, Shenzhen has vigorously developed public transportation and bicycle systems, which have improved the efficiency and quality of transportation. In terms of environmental protection, Shenzhen has built several sewage treatment plants and waste incineration plants and promoted clean energy technologies such as solar and wind power generation. These measures have effectively improved the environmental quality of Shenzhen and improved the quality of life of residents.

Beijing, for another example, is the capital city of China and is also a successful example of the development of sustainability. To illustrate, it is widely acknowledged that By strategically augmenting the verticality and density of urban edifices, land resources are efficiently conserved, while simultaneously mitigating reliance on private vehicular transportation, thereby contributing to a reduction in carbon emissions in a scientifically rigorous manner. Population [7]. Therefore, Beijing, already short of water, needs to bear the water for so many people. To cope with the water scarcity problem, the Central Route of the South to North (S2N) Water Transfer project was initiated in 2003. The Central Route diverts Yangzte River water to Beijing and other neighbouring provinces along a 1267 km constructed canal. The Central Route S2N Water transfer became operational in 2015. Beijing receives approximately 1.0 billion m3 of transferred water annually [8]. The transferred water has become a new alternative water source for the urban water supply and alleviated the water shortage problem in the city. Thus, groundwater abstraction has been reduced from more than 2 billion m3 per year to 1.5 billion m3 per year in Beijing since 2015. The operation of emergency well fields was suspended. Pumping wells for industrial water supply from deep confined aquifers were shut down. This is a significantly practical sustainable strategy which is eager to resolve the issue of

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the scarcity of water. Furthermore, there was many industrial parks in the suburbs of Beijing. In order to make the city more livable and sustainable. The government of Beijing decide to move these industrial parks into other province called Hebei which nearby Beijing in 2014. The relocation of the factory not only makes the city's air better, but also the site of the factory is transformed into a venue for the Beijing Winter Olympics, which is the so-called saving money and labor perfectly embodies the concept of sustainable development of the city. Moreover, the relocation of the factory not only makes the city's air better, but also the site of the factory is transformed into a venue for the Beijing Winter Olympics, which is the so-called saving money and labor perfectly embodies the concept of sustainable development of the city, Beijing, the city I have been there for several years, has established copious city parks as a major plus of Beijing's sustainability. Those city parks can not only protect the environment of the city by cleaning up the air reduces the impact of carbon emissions but can also be an excellent entertainment for residents who live in Beijing.

4. Influencing Factors and Challenges

Urban sustainable development faces various challenges. First of all, urbanization accelerates resource consumption and environmental pollution. The rapid growth of the urban population leads to the continuous expansion of urban land use and increases the pressure of destruction of natural ecosystems. Secondly, the shortage of resources is an important factor restricting the sustainable development of cities. The increasing shortage of energy resources and water resources limits the development space of cities. Finally, environmental pollution is a major obstacle to sustainable urban development. The waste gas and wastewater discharged from cities cause serious pollution to the natural environment and threaten the health and quality of life of residents.

In order to cope with these challenges, urban planning should adopt corresponding countermeasures. First of all, urban planning needs to pay attention to ecological protection and restoration and improve the ecological carrying capacity of the city. Secondly, urban planning needs to promote the concept of low-carbon urban development to reduce carbon emissions and resource consumption. Finally, urban planning needs to pay attention to citizen participation and government management and form an urban governance mechanism with the participation of the whole society to promote the realization of sustainable urban development.

In short, the sustainable development strategy in urban planning is the key to the future development of cities. Through rational land use planning, transportation planning and environmental protection planning, the realization of urban sustainable development can be effectively promoted. At the same time, urban planners need to recognize the challenges and difficulties faced by urban sustainable development, take corresponding countermeasures, and actively promote the process of urban sustainable development.

5. Conclusion

Implementing sustainable development strategies in new cities is an inevitable choice for current and future urban development. Through the comprehensive application of various sustainable development strategies, new cities can effectively reduce resource consumption, reduce environmental pollution, improve social welfare, and realize the coordinated development of ecology, society and economy while developing the economy. In the future development, the new city needs to further strengthen the cooperation between the government, enterprises and the public to jointly promote the implementation of sustainable development strategies and build a more green, harmonious and livable urban environment.

Strengthen government management and planning: the government should further clarify sustainable development goals and policies, establish a sound urban planning and management

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system, and effectively supervise the use of resources and environmental protection in the process of urban development.

Promote the development of green industries: Encourage enterprises to increase research and development and innovation of green technologies, promote the development of green industries, and cultivate new economic growth points.

Enhance public awareness and participation: carry out sustainable development education, improve public awareness and attention to environmental protection, and encourage the public to actively participate in the practice of sustainable development.

Strengthen international cooperation and exchange: actively share and learn from the experience of sustainable development with other countries and regions, learn from their successful experience, and jointly promote the process of global sustainable development.

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