Current situation, perspectives, and innovative solutions for sustainable urban development in Vietnam

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Abstract

After more than 37 years of renovation, especially following 15 years of implementing the overall development orientation adjustment of Vietnam's urban system (approved in 2009), significant achievements have been made in the planning, construction, management, and development of urban areas in our country. The architectural landscape and construction architecture of urban areas have undergone many changes towards modernity, featuring unique characteristics, receiving numerous international awards, and engaging in exchanges with international architectural and cultural domains while still preserving its identity. However, Vietnam's urban system still faces several fundamental limitations regarding scope, quantity, planning, management, and habits due to various reasons.

This article addresses: the current state of urban development, limitations, and causes of sustainable urban development; guiding perspectives, goals for sustainable urban development, and innovative solutions for sustainable urban development in Vietnam.

Key words: Sustainability; Sustainable Development

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Introduction

Urban areas have always been considered the centers of political and economic power, exerting a strong influence on the socio-economic development of regions and countries. Urban development (UD) presents opportunities for each nation, region, and locality to achieve remarkable growth in various aspects. UD is also a driving force for economic development and serves as an inspiration for the overall progress of the country. Urban areas have made significant contributions and had a profound impact on the entire socio-economic life of each nation. When developed in the right direction, with proper planning and vision, urban areas can fully realize their potential. Conversely, a lack of direction and vision can lead to long-term issues that require extensive solutions.To achieve sustainable UD in our country, particularly in major cities, it is essential to aim for the development goal of creating Green, cultural, civilized, and modern cities. This is a rational approach to achieving sustainable UD. Therefore, studying the current state, guiding perspectives, and proposing innovative solutions for sustainable UD is necessary.

1. Current Status, limitations, and causes of sustainable urban development in Vietnam

1.1. Current status of urban development in Vietnam

During the renovation period, the national urban system has experienced significant growth in both quantity and quality, affirming its role as a driving force for the socio-economic development of the entire country and each region. Urban space has expanded, and investments in technical and socio-economic infrastructure have become increasingly synchronized and effective. The quality of life for urban residents has gradually improved in both material and spiritual aspects. According to the 2022 National Urban Conference, [1], [2]: the number of urban areas in Vietnam increased from 629 in 1999 to 772 at present, including 2 special-class cities, 15 class-I cities, 14 class-II cities, 47 class-III cities, 64 class-IV cities, and 630 class-V cities; By August 16, 2024, there are a total of 908 urban areas in the nation, comprising 2 special cities - Hanoi and Ho Chi Minh City, 21 class-I cities, 39 class-II cities, 43 class-III cities,97 class-IVcitiesand 706 class-V cities[3].

UD has changed the face of the country. Initial growth poles for economic growth and innovation centers, as well as hubs for science, technology, education, and training, have been established in major urban areas. Economic growth in urban areas averages between 12-15%, which is 1.5 to 2 times higher than the national average. Urban areas have played a crucial role in job creation, increasing social welfare, attracting investment, developing science and technology. The urban economy grows at a high rate, contributing approximately 70% of the country's GDP. Along with the national renovation effort, urban work has also been renewed, making urbanization a driving force for the development of the entire country and each region[4]. Specifically:

- In terms of urban administrative units, the country has 5 centrally governed cities, 63 provincial cities, 47 provincial towns, and 613 townships (including 27 class-IV townships).

- The urban population (inner-city, inner-town, and townships) reaches approximately 30.4 million people. Among them, 2 special-class cities and 15 class-I cities account for about 14.8 million people (49% of the urban population nationwide). The average urbanization rate nationwide is about 34%, with the highest concentration in the Southeast region (64.15%) and the lowest in the Northern Midlands and Mountainous region (21.72%). Centrally governed cities with high urban population rates include Ho Chi Minh City at 83%, Binh Duong at 71.6%, and Quang Ninh at 68.86%. Provinces with the lowest urban population rates include Bac Giang at 13.05%, Tuyen Quang at 12.41%, and Thai Binh at 10.7%...

-Regarding urban land, the total area of the country is 331,698 km², with urban land area remaining unchanged compared to 2017. The total natural land area of urban areas is 34,017 km², with inner-city and inner-town areas accounting for 14,760 km² (approximately 10.26% and 4.42% of the country's total natural land area, respectively). Many inner-city and inner-town areas still have 50-60% of agricultural land or unused land available for UD. The phenomenon of converting, transferring, leasing, mortgaging, and contributing capital with land use rights, especially in peri-urban areas, requires strict management. [1]

1.2. Limitations and causes of limitations in sustainable urban development

a. Basic limitations

Alongside the positive results achieved, there are still many existing challenges and limitations in UD that need to be addressed:

- These include issues such as the overloading of urban infrastructure, including transportation, electricity, water supply, and telecommunications; a shortage of social housing and housing for middle-income groups;

- The impacts of climate change, increasing urban flooding, severe environmental pollution;

- Delays in housing development projects and widespread "suspended" projects;

- Healthcare, education, and cultural infrastructure lagging behind economic development, leading to overloading; [5]

- Urbanization is lacking in quality, with urban infrastructure failing to meet the needs of urban population and economic development. ... the deficiency of sustainable, civilized, and modern urban development models is apparent;

- Urban expansion focuses on short-term goals, neglecting future planning. Pollution levels in big urban areas have a tendency to rise and grow more intricate, resulting in numerous adverse effects;

- After the planning phase is finished, modifications and adjustments are necessary, disrupting the synchronization... Urban management lacks the necessary management and professionalism to meet development needs;

- The legal system concerning investment in urban development planning, public investment, and housing land allocation is disjointed, lacks uniformity, and slow to be innovated.[1]

b. Causes of the limitations

- Urban planning shows a lack of innovation, vision, and quality, progressing slowly;

- There are numerous restrictions in place with the current setup, and in several areas, the planning modification remains insufficient.;

- Urban areas and urban development are still facing a lack of momentum and stability in their institutions and policies;

- Managing, organizing, carrying out laws, mechanisms, and policies on planning, construction and urban development is not significant.[5]

2. Guiding principles and objectives for sustainable urban development

2.1. Guiding principles

- Urbanization is an objective necessity, a crucial driver for rapid and sustainable socio-economic development in the coming period. Strengthening the leadership and direction of the Party, along with enhancing the effectiveness and efficiency of state management, is paramount. There must be unified awareness and action in refining institutions, planning, construction, management, and sustainable UD towards green, civilized cities rich in identity. These urban centers should pioneer and lead innovative activities, becoming the driving force for development. This is a regular and important task for the entire political system;

- It is essential to innovate urban planning thinking, theory, and methodology. Urban planning must have a long-term vision, be comprehensive and modern, with people and quality of life at its center. Urban culture and civilization should form the foundation for development. There must be a harmonious combination between urbanization, UD with industrialization, modernization, new rural construction, and economic restructuring, while ensuring social development management, national defense, and security. Urban planning and infrastructure development should be one step ahead, creating the primary resources for UD. It is crucial to resolutely eliminate term-based thinking, the phenomenon of "suspended planning," and mechanisms of "asking-giving" or "group interests" in the construction, adjustment, supplementation of planning;

- The legal system must be perfected, breakthrough mechanisms and policies for sustainable UD must be issued to promote rapid and efficient growth in urban economies. There should be a comprehensive and harmonious combination of urban renovation, regeneration, and reconstruction with the development of new urban areas. This approach should ensure modern urban architecture rich in identity, preserving, and promoting distinctive cultural elements; It is important to strongly develop sectoral; regional linkages and multidimensional connections between cities. Attention should be paid to reorganizing community life and economic development in the process of urban reconstruction and development; ensuring a high quality of life in urban areas and meeting the basic housing and social infrastructure needs of urban residents;

- The sustainable urban system should be developed as a network, rationally distributed and appropriate for each region, ensuring synchronization, unity, and balance between regions. Cities with comprehensive functions should be developed with reasonable scale and population, oriented towards green, smart urban areas that adapt to climate change and are prepared for natural disasters and epidemics. High connectivity should be ensured between centrally-run cities, national-level central cities, regional urban areas, and rural areas. Cities with special advantages should be selected to build into economic, financial, commercial, and service centers with high regional and international competitiveness;

-Stronger decentralization and devolution of power to urban authorities should be implemented, coupled with emphasizing responsibility and ensuring unified leadership, direction, and management from the central level. It is crucial to promote and effectively exploit resources from the cities themselves and from society for UD. All conditions should be created to encourage economic sectors, especially the private sector, to participate in urban

development investment. Strict measures should be taken against violations in implementing legal regulations on urban planning, construction, management and UD... [6]

The new phase of UD in Vietnam is guided by several key principles:

- Urbanization is recognized as an objective necessity...;

- There is a call for innovation in urban planning thought, theory, and methodology;

- Focus is placed on perfecting the legal system and implementing breakthrough policies for sustainable UD, aimed at promoting rapid and efficient growth in urban economies...;

- The development of a sustainable urban system is envisioned as a network, rationally distributed and tailored to each region, ensuring synchronization, unity, and balance across regions...;

- There is a push for stronger decentralization and devolution of power to urban authorities, coupled with enhanced responsibility and maintaining unified central leadership and management...; [2]

These principles clearly demonstrate the central government's long-term vision for the country's development trajectory.

2.2. Objectives

a) General objective:

The overarching goal is to accelerate the pace and enhance the quality of urbanization, promoting sustainable UD through a networked approach. This involves establishing smart, dynamically connected urban chains linked to the region and the world. The aim is to refine institutions and policies for planning, construction, management, and sustainable UD. Urban infrastructure, particularly essential technical and social infrastructure, is to be developed in a synchronous and modern manner. The urban economy is expected to grow rapidly, efficiently, and sustainably. High quality of life in urban areas is prioritized, ensuring that basic housing and social infrastructure needs of urban residents are met. The development of modern, green, smart, and culturally rich urban architecture is emphasized, with distinctive cultural elements preserved and promoted.

The current overarching goal of sustainable UD in Vietnam is to create sustainable urban areas that are connected in a network, establishing several urban areas and smart urban chains that are linked to the region and the world.

Additionally, with the world moving towards modernization and advanced technology on a daily basis, it is necessary for Vietnam's sustainable UD to keep pace with these global developments.

b) Specific targets:

- The urbanization rate is targeted to reach a minimum of 45% by 2025 and exceed 50% by 2030;

- By 2025, there will be approximately 950 to 1,000 urban areas across the country, increasing to around 1,000 to 1,200 urban areas by 2030. By 2025, 100% of urban area, both existing and newly developed, will be covered by comprehensive plans for zoning, renovation and urban growth;

- The proportion of urban construction land to total natural land area is expected to reach approximately 1.5-1.9% by 2025, increasing to about 1.9-2.3% by 2030... [2], [6]

Therefore, in sustainable UD within Vietnam, the speed of urbanization has been clearly and specifically defined in accordance with each phase of the country's progress.

3. Innovative solutions for urban development in Vietnam

Sustainable UD has become a trend in many countries to create livable cities, cities that balance with nature, reduce ecological footprints, and respond to climate change. Globally, many cities have adopted sustainable UD solutions since the late 20th century, achieving positive results that improve living environments, balance ecosystems, connect people with nature, and promote sustainable development. While Vietnam has made initial steps toward sustainable UD, there is still a lack of comprehensive legal documents, especially unified principles, criteria, and suitable solutions for building sustainable cities. The following summarizes some global lessons on sustainable UD, aiming to provide experiences for sustainable UD in Vietnam in the coming time.

In recent years, the Prime Minister has approved several key orientations to promote UD through planning and plans: The Orientation for the Master Plan for Vietnam's Urban Development (Decision 445/QD-TTg dated April 7, 2009), the National Urban Upgrading Program for the period 2009-2020, the National Urban Development Program for the period 2012-2020, and the need to implement the following solutions [7]:

3.1. General key solutions

General key solutions in urban advancement in Vietnam to overcome limitations in urban institutions, policies, lack of progress in UD, unstable, and basic limitations on urban infrastructure overload; climate change, flooding, urban environmental pollution; onmedical infrastructure, education and cultural infrastructure; on housing development projects, slow UD - "suspended" project... including:

- To make the set goals a reality, all levels and sectors must be determined, effortful, and decisive in their actions to achieve the desired results. The Ministry of Construction should actively guide, coordinate, and support localities in developing specific action programs. It is necessary to promptly build a national urban program to integrate resources, avoid fragmented planning, overlapping, and inefficient programs, while also coordinating to monitor and urge the implementation of the Government's Action Program. The expected outcomes of this solution are: By 2025, the number of urban areas nationwide will reach about 950-1,000; by 2030, about 1,000-1,200 urban areas. By 2030, some national and regional urban centers will meet urban-level health, education, training, and cultural targets comparable to the average of the top 4 ASEAN countries. The urban economy will contribute approximately 75% to the national GDP by 2025 and around 85% by 2030...;

- Central ministries and agencies should proactively build and monitor indicators related to UD. Implement regular reporting regimes so that the Government can provide timely directives and support; consider establishing mechanisms, creating conditions, providing guidance to identify, and create resources for implementation; guide localities in allocating resources to implement local action programs;

- Provinces, centrally-run cities and urban areas nationwide are the direct managers and organizers of implementing the Resolutions [2], [6]. Local authorities should thoroughly grasp the "Government Action Program", supplement targets into the Resolutions of the Provincial and City Party Committees, build mechanisms for serious implementation; closely follow the targets and strictly supervise the implementation process;

- Local authorities should select the most important breakthrough step for sustainable UD, which is a comprehensive innovation in urban planning methods, processes, content, and products. Accordingly, urban planning should adopt a multi-disciplinary, inclusive approach with a long-term, comprehensive, strategic vision, respecting market principles, and sustainable development principles[8], with the motto of placing people and quality of life at the center, urban culture and civilization as the foundation. At the same time, it is necessary to apply tools to strictly control the urbanization process and UD;

- Restructuring the economic development space of urban areas; enhancing competitiveness, increasing economic density and regional linkage, linking between urbans, linking urban and rural areas in urban economic development. Alongside this, renewing the economic growth model of urban areas through the development of high-quality human resources linked to the promotion of science and technology application and innovation;

-Additionally, to better and more effectively manage urban areas, stronger decentralization and empowerment to urban authorities are needed; particularly, mechanisms and tools to optimize cooperation between localities in urban development should be introduced promptly.

3.2. Specific solutions

Measures in UD in Vietnam to alleviate overcrowding and improve the quality of urban infrastructure; concerning vision, policies, organizational structure, funding, supervision, immediate and long-term necessities.... contributing to promoting the implementation of integrated planning. These solutions include:

1) Promoting the implementation of Government orientations, programs, and projects

To implement the projects approved by the Government, it requires all levels, sectors, and localities to innovate strongly in their thinking, enhance the leadership capacity of the government, and national policies on UD. At the same time, policies and solutions for land allocation, management, real estate valuation, land reserve calculation for development, investment programs for industrial production facilities and labor attraction must be put forth. It is necessary to develop investment and development plans to modernize urban systems, technical infrastructure, improve living conditions for the people, and promote synchronized urbanization in urban and rural areas. To ensure sustainable UD that can respond to climate change challenges [9], Ministries, sectors, and localities must coordinate more closely with the Ministry of Construction to gradually implement it.

2) Innovating processes, technology, techniques for research and development (R&D),industry-specific cooperation and establishing networks

To create strength and speed of urban development, it is necessary to innovate processes, technology techniques, gradually approach fast information technology infrastructure development, R&D, and industry-specific cooperation networks. In terms of legislation, continue to review, amend, supplement, or propose authorities to amend and supplement to improve mechanisms and policies to attract urban investment. Promote administrative reform, minimize administrative costs for investors. Innovate investment promotion, trade, and tourism programs in depth; continue to leverage central funding. However, it is necessary to increase investment invitations, enhance development cooperation both domestically and internationally through PPP, BTO models to ensure infrastructure development goals and investor development objectives. During development, building urban governance is necessary to ensure effective urban management. Urban areas need thorough legal preparation, human resources, and sufficient apparatus to undertake tasks and leverage resources for targeted, harmonious UD.

3) Strictly controlling urbanization processes in urban constructionplanning

Strict control of urbanization processes in urban planning is necessary. Regulations and institutional frameworks must be suitable for the socio-economic development situation in each locality. Urban construction planning, urban planning, and urban management development are priorities and should have a long-term vision. Development orientations for territorial spaces are forums for societal contributions of intelligence, material, and voluntary implementation of development content in each urban area. Urban construction planning must be comprehensively coordinated with related sectors and local authorities to ensure feasibility. Strengthen inspection and strictly handle legal violations in urban management, protecting against environmental degradation and pollution. Promote information dissemination, legal education to enhance community awareness of sustainable urban development. Planning needs to be reviewed and adjusted annually and every five years, incorporating positive factors and overcoming negative ones. Long-term regulations should limit certain content.

4) Enhancing urban quality, re-establishing order in land management and urban management

Many projects are being adjusted and fragmented during implementation, disrupting planning. Therefore, localities need strong measures to improve land management, eliminate "suspended" planning images, abandoned projects, and ensure land is used for its intended purpose, re-establishing order in land management. The Government issued Decree 11/2013/ND-CP on January 14, 2013, on UD investment management and the guiding Circular for its implementation. Localities need to quickly implement and approve UD areas as a basis for subsequent investment steps; review projects, classify, and adjust project implementation according to urban development area plans; consider establishing UD area management boards; strengthen project control from planning, investment approval to investment implementation and UD investment management.

5) Focusing on developing core regional-level urban areas

For large urban regions, it is necessary to further promote the goal of developing core regional urban nuclei; UD linked to national-level industrial centers where a large number of workers can be mobilized. Satellite cities within 40 km of the center should be connected by metro systems, rapid railways, and highways to develop together, avoiding excessive concentration in large urban areas. Urban areas must be built on a strict and dynamic legal system, with well-prepared planning, programs, and implementation plans. Investment in urban renovation and new construction should go hand in hand. For each urban area, to avoid "deficiencies in UD," urban governance should focus more on structure,

efficiency, competitiveness, and the urban position in the national and regional urban system. Sustainable UD, with key focus points, will create breakthrough successes.

6) Expanding urban areas and increasing urbanization rate based on healthy population development

Expanding urban areas and increasing urbanization rates based on healthy population development, improving community health, stabilizing urban-rural settlement, promoting housing programs, especially for low-income people; implementing urban upgrading projects, synchronously renovating existing residential areas in urban and suburban areas. Allocate, connect, and complete public centers, recreational areas, and green spaces and water systems in urban areas to create open spaces, general landscapes, and air environment regulation, meeting the environmental needs for living, working, travellingand recreation for individuals and the entire society.

7) Promoting environmental protection planning and implementation

Formulate and implement environmental protection plans, propose solutions, plans, and roadmaps for construction planning combined with environmental protection and water source protection. Environmental legislation in Vietnam is being completed, but it still needs supplements in fields such as green growth; water quality and aquatic ecosystems; water supply and drainage - land - groundwater, air and climate change; waste and recycling; health/chemicals; nature and national parks; international cooperation, etc. Simultaneously, implement policies such as waste classification at the source, recycling waste to save resources, generating new energy, and useful products like fertilizers, methane for electricity production. Encourage CO2 reduction measures: saving electricity, coal, oil, or using technologies that produce less emissions. Support and encourage businesses and communities to implement policies and economic tools in environmental management and protection.

8) Developing urban transportation and enhancing investment in public transportation

For urban transportation development, increase investment in public transportation development, apply smart traffic management techniques with electronic, telecommunications, broadcasting, and road vehicle control functions; this is smart traffic infrastructure, processing updated traffic information to optimize traffic equipment and relieve traffic congestion.

Conclusion

Sustainable UD in Vietnam is currently recognized as a key driver of economic growth for provinces, regions, and the nation as a whole. Cities are expected to strive to affirm their assigned roles and functions. To achieve this, local and central authorities must shift their perceptions, avoid redundancy and diffusion, refrain from arbitrary impositions, and seriously adhere to urban construction planning with specific implementation strategies. Vietnam's UD must serve the country's industrialization and modernization efforts. Achieving an urbanization rate of 50% or higher is synonymous with Vietnam surpassing the middle-income threshold, positioning the country for economic breakthroughs and transition to a new phase of development with high income levels comparable to international and regional standards.

With the resolute commitment and vigorous engagement of the entire political system, all levels of government, various sectors, and the support of the international community, Vietnamese cities are poised for robust and breakthrough development. Urban economies are expected to grow rapidly, efficiently, and sustainably. The quality of urban life is projected to advance to high levels, ensuring that basic housing and infrastructure needs of urban residents are met. Urban architecture is anticipated to develop in a modern, green, smart, and culturally rich manner, with distinctive cultural elements preserved and promoted./.

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Risk management experience in Urban underground construction: Lessons for Vietnam

Bui Thi Ngoc Lan

Abstract

In the world, urban underground works have been developing for a long time, particularly in countries like Russia and China, where underground urban structures are highly developed and complex. Vietnam's urbanization rate is increasing as the urban system grows in size, quality, and scale. Urban subterranean works in Hanoi and Ho Chi Minh City, where the rate of urbanization is rapid, land finances are depleted, and traffic is congested, primarily include station systems, vehicle exit stations, subway parking, road traffic cellars, high-rise basements, commercial cultural centers, diverse technical underground systems, massive drainage systems, and civil defense buildings [1]. Urban underground construction involves the construction of underground works with numerous challenges, complexity, and high risk; thus, risk management is an essential and inseparable component of urban underground construction. The article investigates risk management practices in urban underground construction in Russia and China, with some lessons for Vietnam.

Key words: Urban underground construction; Construction; Risk; Risk management; Lessons

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1. Introduction

Currently, under the conditions of socio-economic development and rapid urbanization, urban underground construction projects have been and are being cared for by many countries around the world and by scientists and major urban authorities in Vietnam. Underground construction is a component of urban engineering infrastructure that plays an important role in modern, sustainable urban development. Since the 19th century, countries around the world have invested in the construction of urban underground buildings. Along with increasing technological development, many complexes of commercial buildings and underground services have been built and developed, along with the development of transportation systems and architectural works [1]. With an urbanization rate of roughly 42.7%, there were 902 municipalities in Vietnam as of December 2023, with 02 special municipalities: 22 type I, 36 type II, 45 type III, 94 type IV, and 703 type V municipalities [2]. Large cities now have limits due to population growth and land depletion, putting pressure on technical and social infrastructure. In particular, there are increasing housing shortages, traffic congestion, flooding, environmental pollution, etc.; thus, the necessity to create and exploit urban underground buildings becomes the first priority objective of large municipalities. The article investigates the experience of risk management in urban underground construction in Russia and China, drawing lessons that can be applied to Vietnam to reduce the unfortunate risks associated with urban underground construction.

2. Literature review

In order to make use of the underground space for economic and social development, especially for the development of large urban areas, the world has been implementing various types of underground construction in urban areas. There are different ways to classify underground structures. At present, our country is very interested in underground construction and underground technical infrastructure, so here is a preliminary synthesis of the groups as shown in Figure 1, with the three main groups being underwater construction, underground engineering infrastructure, and other underground or special construction [3].

To make optimal use of resources in urban subterranean construction in a number of large municipalities for socioeconomic growth, it is required to investigate risk and risk management during the construction process. Urban underground construction carries a significant level of risk and difficulties in meeting project progress and quality standards. This is attributable to the underlying conditions of the construction process and a variety of risk factors [3].

Risk, defined as the likelihood of harm from any hazard, symbolizes the world's general predicament, in which the future cannot be accurately forecast [3]. Risk management seeks to: (i) reduce resource and project expenses; (ii) minimize injury and disadvantage to project participants; and (iii) promote project outcomes and partnerships. The risk of underground construction is associated with the possibility of uncertainty about technical progress and the cost of construction. Risk in urban underground construction is the quantitative assessment of risk arising from the implementation of the construction, operation, repair, and reconstruction processes of underground buildings [3]. Especially complex projects such as building underground corridors for metro operations involve risks in all phases of the project, from the feasibility phase to the operational phase. These risks have a direct impact on progress, cost, and performance. Reilly (2005), Reilly and Brown (2004), and Sinfield and Einstein (1998) conducted their research on underground tunnel projects. Reilly and Brown (2004) argue that the Underground Infrastructure