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PHAM THI NHAM

**SPATIAL ORGANIZATION OF THE WEST
GREEN CORRIDOR OF HANOI**

PhD Thesis Summary

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INTRODUCTION

1. Importance of the Study

Hanoi Green Corridor, named in the 2008 Master Plan, has made many contributions to the 'dynamic balance' between central urban areas, satellite urban areas and rural areas with low construction density, preserving up to 70 % of natural and agricultural land - most of which is located in "Doai land". Up to now, there has been many opposing views: environmentalists want to maintain the green corridor as a green environmental and climate change-resistant structure, while economists and real estate experts want to eliminate it, arguing that it is hindering the development of the capital, which is in need of construction land fund. The green corridor west to Hanoi is a solution applied from the green belt planning of the London metropolitan area. After more than 10 years, Hanoi's green corridor has achieved its purpose of controlling urbanization spreading from central urban areas to rural areas.

Theoretically, green corridors and green belts are considered the most important green spaces in post-modern urban structures, emphasized in the era of green transformation and fight against climate change in the 21st century; applied at the scale of urban and inter-urban areas, green connection in the buffer zone between urban and peripheral areas, hence they have become the foundation for sustainable urban development.

In Vietnam, "green corridor" and "green belt" are rather new terms. However, since the French colonial period, plans have used natural space as the foundation structure. Modern urban plans have closely linked the organization of urban space with the green space network, especially after the Covid pandemic. Rural areas on the outskirts of urban areas in Vietnam have many differences with the world, while green corridors and urban green belts do not have enough legal corridors. When the 2017 Planning Law was introduced, the concept of integrated planning was initially mentioned, a synchronous integrated approach between sectors, fields, resource use and environmental protection for sustainable development. The field of urban and rural planning also follows this direction, identifying the core values of the region, thereby integrating multi-sectoral and multi-objective contents, overcoming overlap. This new approach has opened up a way to resolve the conflict between conservation and development in Hanoi's green corridor through spatial organization solutions.

Research on Hanoi's green corridor has so far resulted in doctoral theses and in-depth research topics. While urbanization continues to increase in many large cities in Vietnam, maintaining green corridors to control urbanization and sustainable development is both a goal and a requirement for the management of urban and agricultural systems nationwide.

That's why the thesis "Spatial Organization of the West Green Corridor of Hanoi" chose as the research object the green corridor in the west of Hanoi (nearly covering the entire Doai region), with the hope that from the perspective of organizational science, can

provide a comprehensive answer about the existence and adaptive development of the Western green corridor in the next planning stages, in terms of theory and solutions.

2. Purpose of the Study

- *Epistemological research purpose*: The organization of green corridor space is not simply the form and structure of functional space, but also covers the natural geographical, economic - social space, cultural space and living activities... to preserve and adapt a green, sustainable living environment as well as pass down values to future generations.

- *The purpose of opening new research for urban green corridor space planning*: Creating a multi-disciplinary and multi-objective approach; new methods and tools to plan and control the development of complex spaces such as the green corridor west of Hanoi, in the context of urbanization and industrialization. These are also core issues of the science of organizing urban green corridor space.

- *Research purposes for high and sustainable efficiency*: Socio-economic efficiency, culture and life, conservation of nature and living environment in the organization and operation of green corridors. From there, we propose sustainable spatial organization solutions for the green corridor west of Hanoi in the context of the current development model transformation.

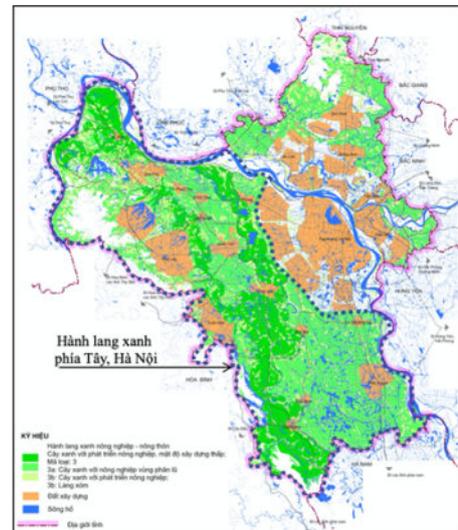
3. Research Subject and Scope of the Study

- *Subject*: Green corridor to the west of Hanoi (at Decision No. 1259).

- *Spatial scope*: Within the boundary of the green corridor west of Hanoi (at the South of the Red River) determined in the General Planning of Hanoi city in Decision No. 1259.

- *Time range*: From the urbanization period in 2008 (after the merger of Ha Tay province with Hanoi City) to present days.

- *Scope of scientific research*: Research on the organization of green corridor space in the west of Hanoi to serve urban planning and planning implementation.



Spatial scope of the thesis research

4. Research Methodologies

Systemic approach; General research methods; Methods for analysing the current situation; Statistical methods; Integrated planning method; Forecasting methods; Map method; Expert method.

5. Research Content

(1) Overview of theory and practice of organizing green corridor spaces in the world and Vietnam; (2) Identify the characteristics and values of urban areas in the west of Hanoi; (3) Forming the scientific basis and practical conditions for the Green Corridor Spatial Organization in the West of Hanoi; (4) Proposing viewpoints, goals, overall solutions and core themes for the spatial organization suitable to the nature, socio-economic and environment of the green corridor west of Hanoi, giving Development management solutions in the context of urbanization by 2045, vision by 2060.

6. Study Results

- Research on overall spatial organization of domestic and national green corridors and green belts. New development trends, research related to the thesis.

- Research to identify the current situation according to the Thematic Framework: Green space conservation (Natural and agricultural); Traditional and heritage villages; Small-scale industries and craft villages; Local urbanization with low density; Other types of mixed space.

- Research the values of using "symbiotic space" to scientifically organize activities of mixed functions in the green corridor west of Hanoi. Forming a theoretical and practical basis for spatial organization according to thematic frameworks of green corridors. This is also a new result contributing to the transformation of traditional village and production spaces in the Western green corridor to a new model.

- Research solutions to organize the green corridor space in the west of Hanoi in terms of function and structure according to thematic framework, overall spatial organization and composition, basic planning criteria (land use, infrastructure, landscape space) and organize implementation according to planning.

7. New contributions of the study

- New awareness of multi-disciplinary and multi-functional theory to achieve multi-objective effectiveness in the Western Hanoi Green Corridor Spatial Organization, suitable to specific characteristics and development needs;

- Scientific identification of Green Corridor Spatial Organization in the West of Hanoi according to 5 Thematic Frameworks: Preserving green space (natural and agricultural); Traditional and heritage villages; Small-scale industries and craft villages; Local urbanization with low density; Other forms of mixed space (mix space);

- Establish principles of the 'symbiotic space' model for the West Hanoi green corridor, functional solutions, structure, spatial organization, planning criteria (land use, infrastructure organization, landscape space and planning implementation) for thematic

frameworks and mixed spatial frameworks (Mixed space), in transforming agricultural and village spaces to adapt to urbanization, industrialization, and digital transformation and climate change.

8. Scientific and practical value of the topic

- *Scientific significance*: Providing scientific arguments on the basis of theoretical research, world lessons, practical needs of the rural peripheral area west of Hanoi, scientific identification of functional frameworks Thematically transforming the spatial organization model of the West Hanoi green corridor to adapt to the urbanization and industrialization context. The thesis also adds arguments to build a theory of spatial organization according to the main spatial frameworks and mixed spaces of the West Hanoi green corridor.

- *Practical significance*: Building a multi-disciplinary and multi-objective approach suitable to Hanoi's specific conditions for professional work on green corridor planning. Propose solutions to organize overall space and space for main thematic frames - representing specific values ranging from history to the future. The results of the thesis contribute to supplementing theory in planning and managing the development of the West Hanoi green corridor in urban and rural planning in Vietnam and Hanoi.

9. Some key concepts and technical terms

- *Urban green space*: In land use planning: green space is open space reserved for parks and other "green spaces", including plant life and other types of natural environments.

- *Green belt*: a strip of natural open space surrounding an urban/urban area, with a green natural function and as a long-term control boundary for city expansion.

- *Green corridor*: natural geographical spaces, agricultural land, open spaces, green parks... are formed in the form of interwoven strips of space inside or outside the urban area for the purpose of preserving the environment, landscape and ecosystem services.

- *Hanoi Green Corridor*: According to the general planning for construction of Hanoi Capital in 2008: "Including rural areas, river and lake systems, hills and mountains, natural forests, agricultural areas... strictly protected to preserve nature, landscape and ensure urban living environment", plays a role in controlling and preventing spontaneous urban development.

- *Theme framework*: Topic framework: Topic framework in scientific research, used by the thesis to identify planning frameworks for spatial organization according to topics within the framework of urban development planning and target programs . The topic

frameworks in the thesis are established to adapt to the main types of current space existing in the Western Green Corridor.

10. Chapter Scheme/ Structure of the Study

In addition to the Introduction, Conclusion - Recommendations, the Content section includes 3 chapters: Chapter 1: Overview of the organization of green corridor space in the west of Hanoi; Chapter 2: Scientific and practical basis for organizing green corridor space in the west of Hanoi; Chapter 3: Solutions for organizing green corridor space in the west of Hanoi.

CONTENTS OF THE THESIS

Chapter 1: OVERVIEW OF THE ORGANIZATION OF THE GREEN CORRIDOR SPACE IN THE WEST OF HANOI

1.1. Overview of urban green spaces in the world and Vietnam

Green corridor is a widely used concept with important connotations in urban green spaces.

- Overview of world urban green spaces: History of formation and development of urban green spaces associated with urban theories; Exists mainly in the form of natural, semi-natural and artificial green areas; Diverse structures shape the urban fabric, bringing ecological, socio-cultural and recreational benefits. The new trend of green space, which plays a role in controlling urban spread in the world, is always placed in relationship with large cities/urban areas. Faced with the challenge of climate change and the pandemic, green spaces have become even more important, participating in solving global challenges, supporting the local economy, preserving nature, tourism, entertainment, and protecting agricultural land. Hanoi's green corridor has more similarities with the green belt concept than the popular green corridor concept in the world.

Comparing the world urban green belt with the Hanoi green corridor: In *Korea*, the green belt was initially designated in Seoul for defense purposes; spatial organization based on the zoning principle of urban planning and divided into two groups: development control and development prohibition. In *the United Kingdom*, the green belt has five purposes: (i) to control the unrestricted expansion of large construction sites, (ii) to prevent neighboring towns from merging, (iii) to support the protection of rural areas, (iv) preserve the special scenery of historic towns, (v) promote urban regeneration, effective use of wasteland. Green belt boundaries are strictly controlled and change annually. In *Vietnam*: Hanoi is the first urban area to mention green spaces

to prevent urban sprawl. The term Hanoi green corridor faces many debates because it is not exactly similar to world terminology.

- Overview of Vietnam's urban green space: Vietnam's urban plans all use natural space as a background element, such as: Hai Phong urban green corridor connecting the city with 3 river basins, urban green wedge Pleiku urban area connects the crater geological system with urban space, Da Lat urban green space controls the development and preservation of natural landscapes, Can Tho urban green land preserves canal structures and gardens to create natural landscapes. Therefore, the urban form of the network country is bold in the South. Hanoi's green space network through planning periods has controlled urban spread in peri-urban areas.

The relationship between urban and rural areas in the organization of urban green spaces in Vietnam is an urban-rural symbiotic relationship. Because Vietnamese urban areas are formed from existing villages, urban and rural areas are intertwined with nature and agriculture; When green spaces, green corridors, green belts or green wedges are established in urban planning, they have become important components in the overall urban structure.

1.2. Current status of green corridor space organization in the west of Hanoi

- The formation and development of the green corridor west of Hanoi is a historical relationship between the countryside (Doai land) and Thang Long - Ke Cho, forming a mixed space and a symbiotic urban-rural relationship. The process of urban expansion to the West and the formation of the Hanoi green corridor is an inevitable urbanization process following each period of administrative boundary adjustment. When Ha Tay province was officially merged into Hanoi on August 1, 2008; Hanoi planning proposes the idea of "green corridor" to resolve the relationship between natural resource conservation and urban-rural development; ensuring Hanoi's sustainable expansion. The green corridor also makes Hanoi different from the world, in that the capital space contains vast, crowded countryside. The role of Hanoi's green corridor over the past 10 years has affirmed that Hanoi has prevented projects from jumping and spreading from the central urban area.

- Current status of the organization of the green corridor space in the west of Hanoi: The thesis focuses on surveying the elements that constitute the organization of the green corridor space in the west of Hanoi, such as: boundaries; population; land; economic, social and environmental space; typical village spatial forms. There are five main spatial elements constituting the green corridor west of Hanoi, including spaces: natural, agricultural,

heritage, village, and handicrafts. The current situation of managing the green corridor area is by district planning and commune planning, but there is a lack of connection between the sectoral economy and the regional economy. The autonomy and self-management role of traditional villages is maintained and is meaningful in building new rural areas.

1.3. Identifying the current characteristics of Green Corridor Space types in the West of Hanoi

The thesis researches the identification of 5 main spatial types of the green corridor west of Hanoi and studies their changes under the impact of urbanization (taking the Doi Moi period as the transition period), including:

Type 1: Natural geographical space and environment. From the natural landscape space, it possesses original natural elements: mountains, rivers, lakes, bringing natural landscape value and rich agricultural production space. Under the impact of urbanization, rivers become flood-slowing and flood-discharging areas (to reduce flooding in Hanoi); Day River and Tich River are seriously polluted; Sai Son mountain cluster is no longer intact.

Type 2: Agricultural and rural space: From the typical landscape of traditional Vietnamese villages formed by village roads and alleys; Communal house roof – banyan tree – village pond; Famous relics include Thay Pagoda and Tay Phuong Pagoda. Under the impact of urbanization, ancient villages have lost their old peacefulness, international exchange and integration have improved the economy, new and modern houses are far different from traditional spaces.

Type 3: Space of craft villages and handicrafts: From the land of Ha Tay with "hundred professions". Under the impact of urbanization, specialized handicraft clusters are formed, with special spatial linkages appearing such as: towns and handicraft handicraft villages; The village itself is also experiencing the process of urbanization and industrialization, and Hoa Lac Hi-Tech Park is forecast to form a hi-tech production chain in the rural areas west of Hanoi.

Type 4: Urban development landscape space: From the urban landscape is a network of towns distributed at traffic intersections, which is the socio-economic center of rural areas. Under the impact of urbanization, new urban areas with modern architecture and settlement structures appear; Village streets and industrial streets tend to spread along inter-district, inter-commune and inter-village roads. Although the

western urban spaces are not within the green corridor boundary, they need to be evaluated because they have an impact on the green corridor.

Type 5: Mixed landscape space: Is the overlap and combination of the four landscape spaces above, in a specific area. The presence of a mixed landscape containing all five elements of nature - agriculture (combining heritage) - industry (handicraft villages) - urban, creates a new unique feature of tourism. Green Lang.

Summary of the characteristics of the main types of space in the green corridor west of Hanoi

	Dạng 1: Không gian địa lý tự nhiên, môi trường	Dạng 2: Không gian nông nghiệp và nông thôn	Dạng 3: Không gian cảnh quan làng nghề - TTCN	Dạng 4: Không gian cảnh quan đô thị	Dạng 5: Không gian cảnh quan hỗn hợp
Các dạng không gian chủ đạo					
Đặc điểm	<ul style="list-style-type: none"> Các yếu tố cảnh quan tự nhiên: sông, hồ, núi. Cung cấp đa dạng sinh học 	<ul style="list-style-type: none"> Cảnh quan nông nghiệp: cánh đồng, ruộng lúa. Là các điểm định cư đã hình thành lâu dài và ổn định trong lịch sử, có kết cấu chặt chẽ. Gắn liền với sản xuất nông nghiệp. Xen giữa cảnh quan nông nghiệp và quần cư nông thôn là di sản lịch sử - văn hóa - tâm linh (đình, chùa). 	<ul style="list-style-type: none"> Làng nghề truyền thống lâu đời, có chuỗi liên kết giá trị với Hà Nội. Đã hình thành các điểm tụ cư và cơ sở sản xuất quy mô nhỏ và vừa. 	<ul style="list-style-type: none"> Xuất hiện ở trung tâm kinh tế - xã hội của các vùng, huyện, liên huyện; đầu mối về hạ tầng kỹ thuật, dịch vụ công cộng, sản xuất. 	<ul style="list-style-type: none"> Tiềm năng kết hợp hài hòa giữa cả bốn yếu tố tự nhiên (cảnh quan), nông nghiệp (bao gồm cả di sản), công nghiệp (tiểu thủ công nghiệp, đô thị)

Hanoi's Western Green Corridor, through analyzing the five main existing space types, especially the changing mixed space, has the potential to establish a strategic planning framework for spatial organization for planning and urban development target program. At the same time, solve current shortcomings affecting the sustainability of green corridors, which are: construction space tends to stick to major traffic routes; The population density is unevenly distributed with a stagnant structure; Traditional village morphology is increasingly bulging and conjoining together into large clusters or strips; Small-scale industrial farming interspersed with new urban projects and changes in population and labor density lead to changes in green corridor space.

1.4. Published research works related to the topic

In the world, there are many studies on green corridors and green belts in modern urban development. However, research on the green corridor west of Hanoi is still a new issue in Vietnam, there are currently only two doctoral theses on this issue, "Establishment of the planning structure of the green corridor west of Hanoi" by Nguyen Van Tuyen (2017) and "Spatial organization in rural residential areas in Hanoi's green corridor" by Dao Phuong Anh (2019). Comparing the three theses with those on Hanoi's green corridor, we clearly see the lack of overlap. Scientific research and published documents related to the Thesis include studies on: (i) rural management in Hanoi; (ii) research on the relationship between ecology, agriculture and urban and rural areas; (iii) Research the characteristics of peri-urban areas and planning for rural areas on the outskirts of large cities.

Conclusion: (i) regarding the scope of research, there is currently no specific research in the west of Hanoi; (ii) Regarding research subjects, there has been no research on the organization of green corridor space in the west of Hanoi; (iii) regarding the research content, although there is inheritance of the thesis research results of Nguyen Van Tuyen and Dao Phuong Anh, the research content of the thesis does not overlap; (iv) Regarding research results, the thesis focuses on organizing functional space, spatial morphology, and planning solutions based on mixed spaces and thematic space frames.

1.5. Research focus

Forming the scientific basis and practical conditions for the Green Corridor Space Organization in the West of Hanoi; Propose viewpoints, goals, overall solutions and core themes for the spatial organization in accordance with the nature, socio-economic and environment of the green corridor west of Hanoi, and provide management solutions. Development management in the context of urbanization until 2045, vision to 2060.

Chapter 2: SCIENTIFIC AND PRACTICAL BASIS FOR ORGANIZING GREEN CORRIDOR SPACE IN THE WEST OF HANOI

2.1. Theoretical basis

2.1.1. Theory of urbanization and urban-peripheral relations

The thesis researches the theory of urbanization and urban-peripheral relations including 3 contents: (1) theory of urbanization; (2) theory of large cities and megacities; (3) theory of urban expansion of large and extremely large cities.

The theoretical system of urbanization helps the thesis realize that the science of spatial organization in urban planning is not simply physical space; but also a complex multi-dimensional relationship in space and time with many factors affecting urban and rural areas from environmental ecology, economics, and society. The system of theories on urban-peripheral relations helps the thesis understand the context of urbanization and industrialization affecting large cities and expanded urban areas, thereby analyzing issues and problems. Outstanding objects and phenomena of Hanoi's large urban periphery have many similar characteristics to large urban peripheries in Southeast Asia.

2.1.2. Theory on the organization of urban green corridor space

The thesis researches the organization of urban green corridor space including: (1) theory on green corridors, urban green belts; (2) theory on the organization of green corridor space. Systematizing these theories helps the thesis understand the origin, nature, development trends and scientific and practical perspectives of the type of green space that limits widespread urban development in peri-urban areas.

Conceptually: green belts and green corridors both have the same purpose of maintaining natural forms and improving urban and rural environments. The green corridor has a linear structure that creates continuity of urban green space components and has no purpose of preventing urban sprawl. Green belt has an array structure

surrounding the entire urban area or part of the urban area; The main purpose is to limit urban sprawl. Therefore, in terms of terminology, the Hanoi green corridor concept is similar to the world green belt.

Regarding the science of organizing Hanoi green corridor space (i) biogeography and ecology theories: applying research to biodiversity conservation is the most important goal of green corridors and Select optimal solutions for spatial organization of biodiversity corridors and green routes connecting residential spaces with open spaces; (ii) Theory of economic, social and ecological transformation: applying research to transform the model of socio-economic development in peri-urban areas that is environmentally sustainable and connected to the community; (iii) theories of spatial form, layered spatial structure - thematic framework, basic layouts - detailing spatial layouts in the thematic framework associated with Urban Design theory is basis for scientific identification of thematic functional frameworks in transforming the spatial organization model of the green corridor in the west of Hanoi to adapt to the urbanization context.

2.1.3. Theory on the model of "symbiotic space for mutual development" in organizing green corridor space

The thesis synthesizes the theory of a symbiotic model suitable for organizing the green corridor space in the west of Hanoi: (1) A symbiotic model between natural and urban ecology; (2) Symbiosis model between urban and rural areas; (3) Industrial symbiosis model to create a circular cycle of waste and reduce emissions; (4) Symbiosis model between ecology and economy; (5) Model of 'symbiotic space co-development' in complex spatial organizations; Allows mixed use of functional spaces within the same territorial unit of the Western green corridor. Symbiosis is a concept in the field of ecology, the living together of dissimilar organisms (Heinrich Anton de Bary). Symbiotic links are expanded to other scientific fields, such as: industrial symbiosis, urban symbiosis, urban-agricultural symbiosis, etc., an approach that is being adopted by the business community, managers move from a linear economic model to a circular economy, innovate to create added value and sustainably manage output waste.

2.1.4. Establish five spatial structures - thematic framework in organizing the green corridor space in the west of Hanoi

The thesis selects five main types of space (mentioned in Chapter I) to establish a thematic framework for researching the organization of green corridor space in the west of Hanoi; which includes: (1) Thematic framework of natural geography, environment and agriculture; (2) Traditional village and heritage theme framework; (3) Thematic framework of craft villages and small-scale handicrafts; (4) Urban landscape theme framework in the context of urbanization; (5) Mixed spatial theme framework. On that basis, determine the value and development potential and serve as the basis for organizing the thematic frame space of the green corridor in the west of Hanoi.

Summary of the values of the five green corridor theme frames in the west of Hanoi

	Khung chủ đề địa lý tự nhiên, nông nghiệp	Khung chủ đề di sản và làng nông nghiệp, nông thôn	Khung chủ đề làng nghề - TTCN quy mô nhỏ	Khung chủ đề cảnh quan đô thị	Khung chủ đề hỗn hợp
Khung chủ đề					
Tiềm năng phát triển dựa trên giá trị	Sinh thái; Lịch sử Văn hoá Hạ tầng Cấu trúc quy hoạch Liên kết không gian đô thị - nông thôn	Xã hội Lịch sử Văn hoá Cấu trúc quy hoạch	Kinh tế Lịch sử Văn hoá Liên kết đô thị - nông thôn	Kinh tế Liên kết đô thị - nông thôn Kết nối toàn cầu	Sinh thái; Lịch sử/Văn hoá Kinh tế/Hạ tầng Cấu trúc quy hoạch Liên kết không gian đô thị - nông thôn Kết nối toàn cầu

2.2. International experience

- Experience in developing urban green corridors, synthesizing the thesis and selecting models: (1) ecosystem services include: supply services, regulatory services, cultural services; Support Services; In Vietnam, using ecosystem services makes an important contribution to the national economy; (2) eco-village, eco-urban village: the scope of activities of an eco-village creates a local economy - biological agriculture; (3) Eco-industrial parks play a role in improving the economic efficiency of businesses, minimizing environmental impacts, and contributing to the economic and environmental well-being of the community; (4) green infrastructure includes a network of "green" elements that are preserved, or enhanced, to address the negative effects of urbanization based on the "building with nature" approach.

- Experience in organizing green corridor space in large cities: (1) the UK green belt (UK green belt) is the most progressive, feasible and successfully managed and operated in the world, mentioned in National National Assembly policy framework; Many lessons are applied by the thesis such as green belt boundary management methods, green belt development perspectives to increase people's access, etc.; (2) experience in reforming Seoul green belt policy, lessons applied by the thesis such as eliminating four types of space outside the green belt, including: village communities with housing density >10 units/hectare and >300 houses/1,000 people; Development projects have an area of > 10 hectares and contribute > 60% of the crop coverage area; projects serving the nation and projects serving local interests; (3) experience in replacing the Tokyo green belt with an urban agricultural belt; (4) experience in organizing green belt space in the Paris-Ile-de-France region according to spatial layouts with urban structures.

- Experience in organizing mixed functions, such as: lessons on developing mixed urban and rural functions; developing the eco-economic corridor; agricultural-urban symbiotic development strategy.

2.3. Legal basis

Legal documents: Law and sub-law documents: Law on Urban Planning; Planning law; Capital Law; Land Law; Environmental Protection law; Government decrees...; National standards, regulations, and technical regulations: Eco-industrial park standards; Target for green growth urban construction (Circular 01/TT-BXD). Major policies and orientations of the country and Hanoi capital: National development strategies and plans: Sustainable development strategy; New rural National Target Program; Resolution 19-NQ/TW, Decision 150/QD-TTg; Decision 84/QD-Ttg; Decision 950/QD-TTg. Legal documents related to the Capital's National Assembly: Resolution 15-NQ/TW; Program 04-CTr/TU; Hanoi National Assembly (Decision 1259); Decision 700/QD0TTg; Decision 313/QD-TTg. In summary: the legal basis is macro-oriented, there are no international or national regulations/guidelines.

2.4. Factors affecting the organization of green corridor space in the west of Hanoi

The thesis addresses (1) the international, domestic and regional contexts of Hanoi; (2) the impact of urbanization on the spread of development from the central urban area, the issue of land and real estate prices; (3) factors affecting the change in green corridor morphology related to natural, environmental, economic, social and cultural conditions. The belt roads of the Hanoi capital region opening to the East will create opportunities for the Western region to develop ecological economics and political factors that determine the success/failure of the green corridor; (4) new development needs and development forecasts, including: the need to develop a "Cultural - Civilized - Modern" Capital; population and land growth needs; ability to develop pervasively; trends in forming new functions in green corridors and ecological economic development, which are the keys to maintaining sustainable green corridors.

2.5. Requirements and conditions for organizing green corridor space in the west of Hanoi

- Conservation space: Requires identification of elements constituting conservation space, including natural features, heritage, and agricultural-rural lifestyle; Identify potential and challenges of conservation space; Conditions for organizing conservation space based on the theory of applying symbiotic conditions;

- Development space based on conservation: Requires identification of elements constituting development space, including: village space, small industry, urban area and infrastructure; Identify the potential and challenges of the development space; Spatial organization conditions for development are based on the theory of applying symbiotic conditions and international experience.

- Requirements and conditions for transforming the green corridor development model: overcoming inadequacies and promoting the potential of mixed space in the direction of integrated planning, solutions for organizing project space on the theory of territorial resilience.

- Requirements for spatial organization: the green corridor west of Hanoi is located in many rural districts, requiring the organization of green corridor space according to the local planning system, including: inter-district regional planning, district planning and commune planning; Determine the general model of the green corridor in relation to Hanoi urban area, determine its boundaries; scale and limits of development; nature and functions according to economic and social development activities; Organize the component space according to 5 identified thematic frames.

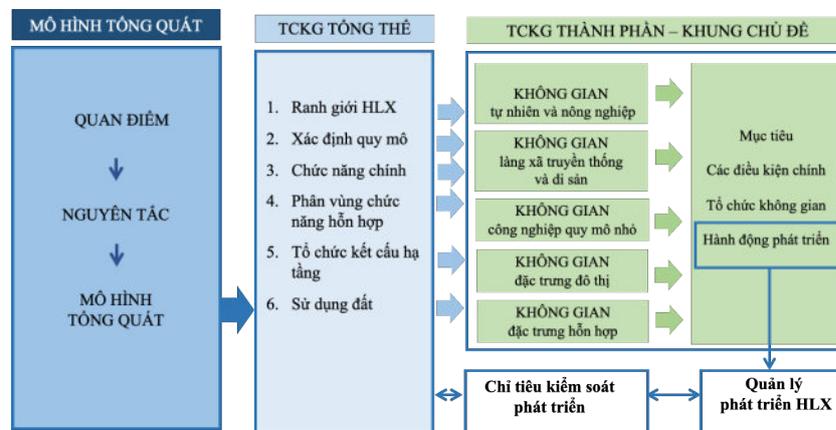


Figure 2. 1: Requirements for organizing green corridor space in the west of Hanoi used in the Thesis

Chapter 3: SOLUTIONS FOR ORGANIZING GREEN CORRIDOR SPACE IN THE WEST OF HANOI

3.1. Viewpoints, principles, criteria

- Viewpoint: (1) Multi-functional integration: green corridor is an important structure of Hanoi urban area with the function of "separating" to prevent urban spread, and is a dynamic rural area of "growth - smart – sustainable"; (2) Preserve outstanding historical, cultural, and ecological values of rural areas so that they create new values of the natural landscape and culture of Doai; (3) Development based on conservation, through mixed spatial organization solutions that are symbiotically linked, ensuring that the green corridor west of Hanoi has the ability to self-recover in the context of urbanization, climate change, and digital technology.

- Principles: (1) The separating green corridor ensures: (i) prevents spontaneous expansion and negative developments of urban areas, villages, small industrial zones and other functions; (ii) control the construction space of merged villages; (iii) protect agricultural and rural cultural landscapes; (iv) preserve the landscape environment of historical settlements and valuable cultural heritage; (v) promote efficient land use,

reconstruction of construction areas and reuse of abandoned land. (2) Growth - smart - sustainable: developing green corridors with a multi-sectoral integration approach in the fields of economics, culture - society, environment, governance and spatial organization; symbiotic urban and rural relationships based on the pillars: green transformation, digital transformation, sustainable and smart growth, crisis resilience, social and territorial cohesion; and basic principles of territorial resilience: reducing risks, improving resilience, increasing adaptive capacity.

3.2. Model and overall solutions for organizing green corridor space in the west of Hanoi

3.2.1. General model

In the Western part of Hanoi, the organization of the Green corridor space is based on the establishment of a general model, with the main goal of maintaining a green rural area as an intermediary between urban and rural areas, harmonizing conservation and development of the peri-urban region of a megacity. The general model includes the following core issues as a boundary condition in development:

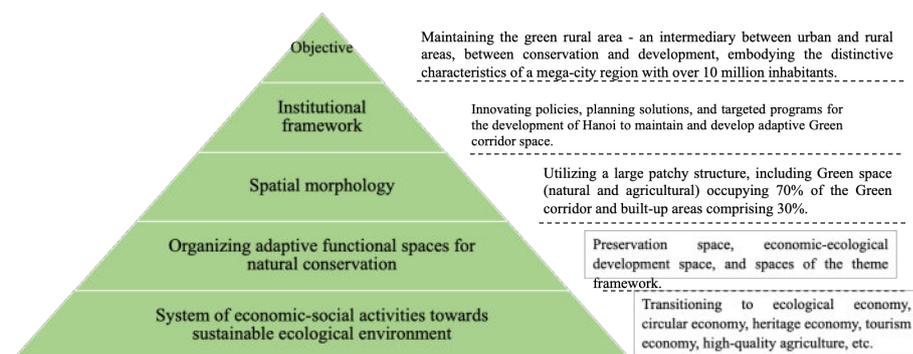


Figure 3.1: General model of organizing the Green corridor space in the Western part

a) Objective: In Hanoi's planning and urban development, The Green corridor serves as an important intermediary between urban and rural areas, between conservation and development, embodying the distinctive characteristics of the large peri-urban area of Southeast Asia. The Green corridor in the West of Hanoi is a continuation of the historical legacy from the cultural region of "Xứ Đoài," which embodies the pristine rural landscapes of "Hà Tây silk countryside," to the era of globalization where the community desires to preserve the Green Countryside within the heart of the Capital known as "Civilized-Cultural-Modern."

b) Institutional framework: Innovating policies, planning solutions, and targeted programs for the development of Hanoi to maintain and develop adaptive Green corridor space.

c) Spatial morphology: The Green corridor of Hanoi has a large patchy structure, establishing an economic-ecological zone surrounding satellite urban areas in the west and creating an ecological balance with the central urban area, which tends to lean towards the east. The Green corridor in Western Hanoi has a patchy spatial morphology; functional spaces including Green spaces (forests, water bodies, agriculture) account for 70% of the Green corridor, interspersed with heritage sites, villages, cottage industry, and urban areas creating mixed-use

spaces in which economic and social activities are vibrant and continuously developing, deeply rooted in indigenous culture.

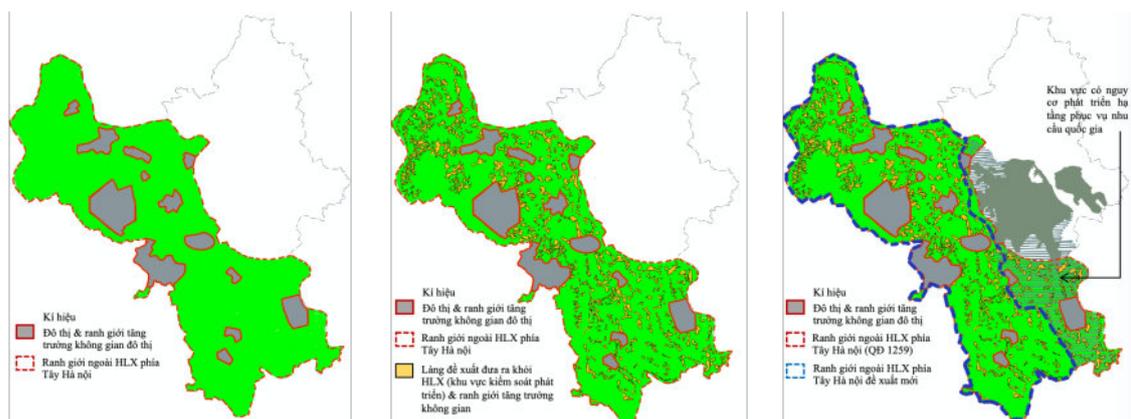
d) Organizing adaptive functional spaces for natural conservation: Not only does the Green corridor prevent urban sprawl and conserve the values of natural ecosystems, indigenous culture, and traditional rural landscapes; but it also helps improve people's access and recreational opportunities, enhance new economic functions in balance with the environment, improve the value and quality of landscapes for a healthy natural ecosystem.

e) System of economic-social activities towards sustainable ecological environment: These are models of urban-rural symbiosis, economic-social symbiosis with the environment, symbiosis of existing factors with new factors towards sustainable development, green transformation, digital transformation, smart growth, community integration, and maintaining the sustainability of the Green corridor; organized spatially according to the Five-Theme Framework.

3.2.2. Green corridor boundaries

Determine the green corridor boundaries according to the following principles: (i) permanent stability: control the unlimited expansion of satellite towns and eco-towns; prevent villages from merging into urban areas; (ii) relative stability: support and protect the countryside from encroachment; (iii) instability: preserving the setting and special nature of the built space; Support urban regeneration and promote the reuse of abandoned land in construction spaces. Construction areas expected to be outside the green corridor include: (i) large villages (or inter-villages) of over 3,000 people or more, (ii) medium-sized villages of 1,000 - 3,000 people (craft villages), (iii) small villages of less than 1,000 people located near rural growth centers, (iv) small industrial zones or functions serving national or city interests (infrastructure, airport...).

Proposed diagram to adjust the western green corridor boundary



Boundaries of the green corridor to the west of Hanoi (Decision 1259)

Proposed boundaries of the western green corridor of Hanoi (Thesis)

Areas that (potentially) won't be included in the corridor

3.2.3. Land size

Proposal for the scale of the green corridor west of Hanoi: forecasting development needs according to Chapter II, the construction space for rural residential areas and industrial

markets in the west of Hanoi will increase by 2%. Proposed threshold limit: (i) Green space (70%), including: nature reserves, water bodies, agriculture and parks; (ii) construction space (30%), including: housing, handicrafts, services, public works, infrastructure.

3.2.4. Primary functions

The Western Green Corridor of Hanoi is a space with mixed functions, distributed into two main functional groups according to land use, including green space (natural and agricultural) and built space. In which: (1) the functions of green spaces include: (i) natural green spaces (rivers, lakes, hills and mountains); (ii) Semi-natural green space (agriculture, flood drainage areas); (iii) Artificial green spaces (historical relics, public spaces, empty spaces in villages and functional areas). (2) the function of construction space includes villages planned to be "compact" and small-scale industrial clusters following the eco-industrial park model; Infrastructure lines link central urban areas, satellite urban areas, and ecological towns with urban areas into a functional network.

3.2.5. Mixed function zoning

Mixed-function zoning of the green corridor west of Hanoi is based on (i) research on the current situation in Chapter I on the elements that make up the green corridor, including: nature, agriculture, heritage, villages, and small-scale industry. and characteristics of main spatial forms; (ii) urban morphology theory in Chapter II about invariant elements to determine conservation elements and variable elements to determine development elements. Mixed functional zoning includes:

(1) Green mixed space (natural, agricultural, heritage); (2) Mixed agricultural - rural villages of Day River and Tich River space; (3) Mixed agricultural - craft village - urban space between Day and Tich rivers; (4) Mixed agricultural - Ba Vi and Son Tay craft villages space; (5) Mixed agricultural - craft villages of Thanh Oai, Ung Hoa, My Duc space; (6) Urban-industrial landscape space west of Ring Road 4 and along the corridor of National Highway 1 and National Highway 1.

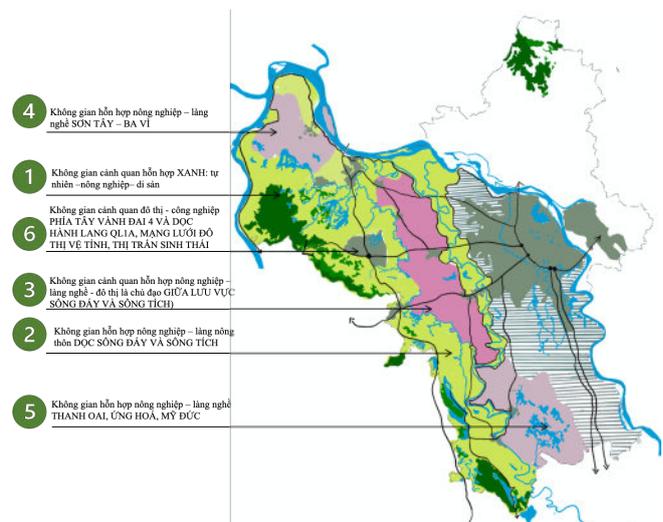


Figure 3. 1: Mixed spatial zoning of the green corridor in the west of Hanoi

3.2.6. Organizing infrastructure

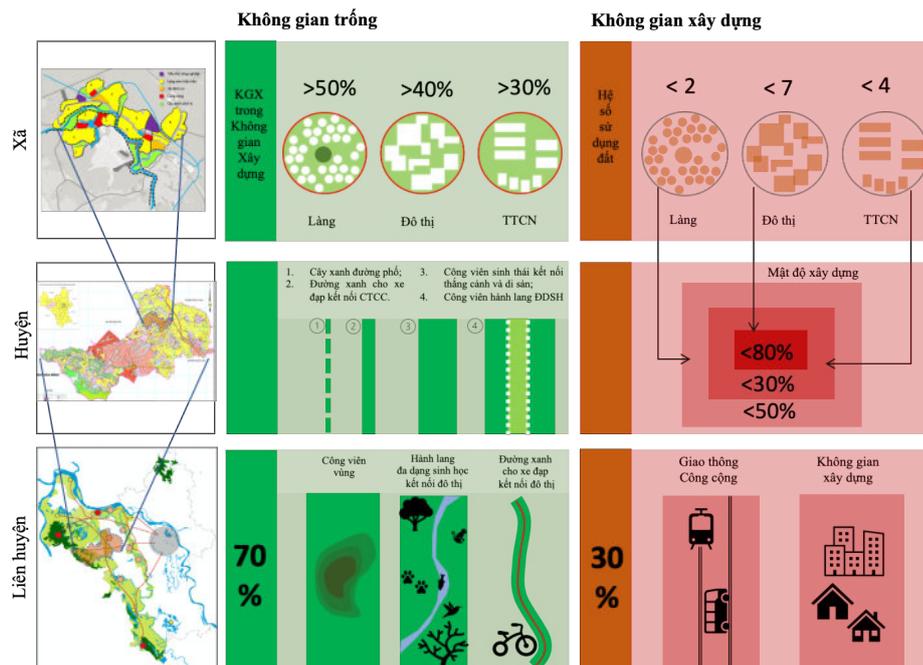
a) Green infrastructure: Natural green space (rivers, lakes, hills) plays the role of green infrastructure, managing open space to: (i) establish natural space to preserve ecological resources, (ii) protect water resources, (iii) optimize energy use, (iv) promote urbanization to adapt to climate change. Classification of ecological systems, including: special protection areas, active protection areas, normal protection areas, flexible protection areas. The approach to minimizing impacts and protecting the green corridor ecosystem in the west of Hanoi follows the principles of: prevention, compensation/compensation, mitigation.

b) Economic and social infrastructure: Agricultural green space is the soul that represents the characteristics of "place", and is the fundamental element that creates cultural identity in rural areas. Promote multi-target agricultural production initiatives in all suburban districts: (i) agricultural commodity production; (ii) urban agriculture combined with urban services and tourism; (iii) create an urban living environment that is meaningful for education, health, biodiversity and agricultural ecology.

The construction space contains a network of economic, social and technical infrastructure connecting urban symbiosis with villages of the green corridor, interacting in the fields of economy - employment, population - migration. , housing - community space, mobility - transportation, food - farming, ecological landscape - entertainment/tourism.

3.2.7. Land use

The green corridor covers a very large area including many suburban districts of Hanoi that are in the process of partially transitioning from rural areas to satellite urban areas and eco-towns, forming a mixed space area.



Establishing mixed spatial land use in the western green corridor of Hanoi

Therefore, the use of green corridor land in the west of Hanoi needs to be studied at 3 spatial scales: inter-district, district, and commune areas; following the principles of: (i) promoting "compressed" development in an ecological direction, (ii) developing open space to serve the community, (iii) reserving enough land to upgrade and modernize village and infrastructure green corridors, (iv) control abandoned land funds in green spaces (natural and agricultural) and built spaces to plan for the right use, (v) establish spatial growth boundaries (villages, urban areas and small industrial zones) ensure permanent stability.

3.3. Solutions for organizing space according to thematic frames of the green corridor in the west of Hanoi

3.3.1. Organized according to the Nature and Agriculture Theme Framework

a) Main objectives: (1) preserve ecological resources of the green corridor west of Hanoi; (2) conserve and restore water resources; (3) promote the development of biodiversity corridors; (4) develop ecological economic models with community participation; (5) develop urban-rural green links, creating meaningful spaces for health, education, science and technology for people to access nature.

b) Conditions: conservation is the key, which consists of: Preserving the existing natural area (70%), restricting urban and industrial development, promoting and applying service models high quality ecosystem and agriculture. Using green space and water surface for ecological purposes, public greenery, entertainment, and water surface regeneration.

c) Spatial organization is characterized

by (1) ecological landscape areas (urban agricultural landscape, ecological agricultural landscape, hilly landscape, mountains planted with perennial crops and forestry, nature reserve); (2) vertical connection – connection naturally following the river's flow routes to create biodiversity ecological corridors, (3) horizontal connections - artificial connections along green routes for bicycles and



Figure 3. 2: Organizational graph of nature and agriculture theme framework

friendly traffic, (4) Attraction centers Activities include cultural heritage works, local specialty tree areas, and newly developed regional parks, outdoor recreation and sports areas.

3.3.2. Organized according to the theme framework of traditional villages and heritage

a) Main objectives: (i) maintain the traditional rural village cultural identity associated with agricultural landscapes and landscapes of historical and cultural relics; (ii) maintain the agricultural ecological belt to prevent widespread urbanization; (iii) promote the "compression" model in village spatial structure.

b) Conditions: preserving agricultural landscapes and cultural heritage is an important priority. Control the rate of urbanization through urban planning and design, limit construction density; Combining high quality agriculture and heritage - culture - tourism economy. Minimize negative impacts from urbanization, promote villages to achieve advanced and model rural commune criteria.

c) Spatial organization is characterized by: agricultural and rural landscape ecological regions; series of residential spaces following the river; rural development key areas. (1) Agricultural-rural landscape ecological regions create typical village clusters, village chains and scattered village points. Network of villages in ecological landscapes follows a compressed, compact model; control of expansion that spreads beyond spatial growth boundaries; combined with the policy of distributing the village's increased population into urban development areas.

(2) Vertical connection: Villages along the river flow connect to biodiversity corridors, providing services to promote activities in cultural heritage areas; specialty tree areas; outdoor entertainment and sports areas. Horizontal connection: Villages are located on the corridor of green routes for buses and bicycles connecting from the central urban area to green corridors and tree-lined routes; Forming service



Figure 3.3: Organizational graph of Village - heritage theme framework

points to promote outdoor entertainment and sports activities. Radial connection within the district: connecting the district center (town) to the commune center, from the commune center to the village. Modernize infrastructure, control construction projects from widespread development.

(3) Key rural development areas: Developing ecological towns; Form rural growth centers based on village clusters linked to rural economic development; Build an innovation cluster that develops vocational training facilities and guides the transformation of product structure to increase value and meet "Green" product standards.

3.3.3. Organized according to the Small Scale Industry Theme Framework

a) Main goals: (1) preserve traditional craft village space; (2) linking craft villages with high-tech value chains.

b) Conditions: preserving traditional craft villages is a prerequisite; develop and transform the production model of craft villages to ensure a "growth, smart, sustainable" green corridor, so that craft villages of the SSI zone can participate in the knowledge economy, green economy, and circular economy, which focuses on improving infrastructure, protecting the environment and beautifying the residential and production landscape; Applying the strengths of existing towns and showrooms to develop services and commerce.

c) Handicraft village production area (formerly Ha Tay) with agricultural and tourism landscapes create an economic-ecological belt that plays an important role in promoting the rural economy, creating livelihoods and jobs, linked with the national economic corridors of Hanoi Capital. Pay attention to the landscape of handicraft zones and craft villages according to ecological models, circular economic models, and control of wastewater and industrial waste. Organizing the main small-scale industrial development space, Hoa Lac Hi-Tech Park is a center connecting and spreading knowledge economy, applying innovative technology and

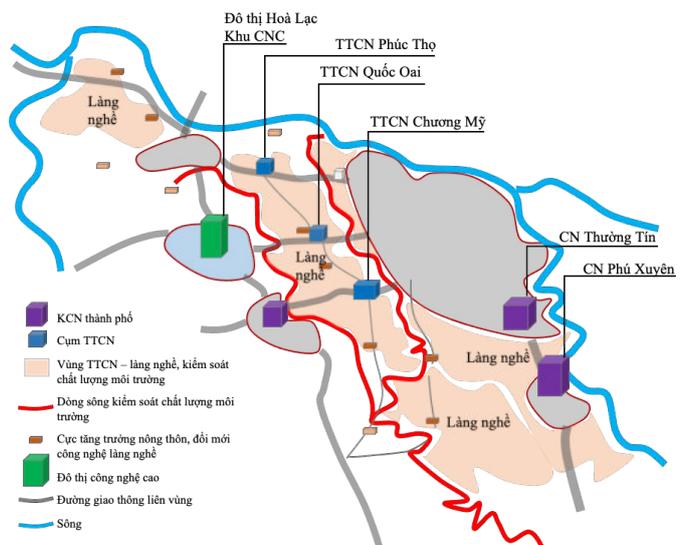


Figure 3. 4: Organizational graph for Thematic framework of small-scale handicraft villages

developing green economy in craft villages and handicraft zones. Develop craft village clusters to become rural growth centers, craft village service centers, science and technology innovation, vocational training, and marketing. Hoa Lac Urban is a gateway service center, connecting craft village products to the international market.

3.3.4. Organized according to Urban Development Theme Framework

a) Objectives: (1) develop "compression model", "eco-urban", "energy-saving urban", "climate change adaptive urban", urban areas are both poles of economic growth

- society, promoting the model of shifting activities in the green corridor towards sustainable development; (2) Urban-rural linkages increase opportunities for rural residents to approach development opportunities and reduce the urban-rural gap, socio-economic linkages and infrastructure linkages are emphasized.

b) Conditions: development based on conservation is a prerequisite. Although the urban areas are located outside the green corridor boundaries, the western urban clusters are all attached to large infrastructure lines radially toward the parent city, creating favorable conditions for widespread development in the green corridor. Therefore, satellite towns or eco-towns develop according to the compact urban model, ecological urban areas with the goal of balanced development between existing villages and new development areas.

c) Spatial organization: agricultural belt and natural belt biodiversity is an important green space that prevents satellite urban areas and eco-towns from spreading in the green corridor. Developing multi-view urban areas in green corridor areas in a new context, Hanoi promotes the TOD model to strengthen urban-rural links. On the other hand, Hanoi is the national growth pole and will be the place where the country's major economic corridors intersect.

Therefore, the space adjacent to the central urban area to the Day River dyke, to the North-South economic corridor passing through Phu Xuyen urban area is under a lot of pressure from urbanization. Urban chain of Son Tay, Hoa Lac, Xuan Mai in the natural belt and biodiversity. The urban chain of Phuc Tho, Quoc Oai, Chuc Son in the Agricultural Belt between Day and Tich River is controlled urban spatial growth boundary; linking social security and employment activities between urban - rural areas.

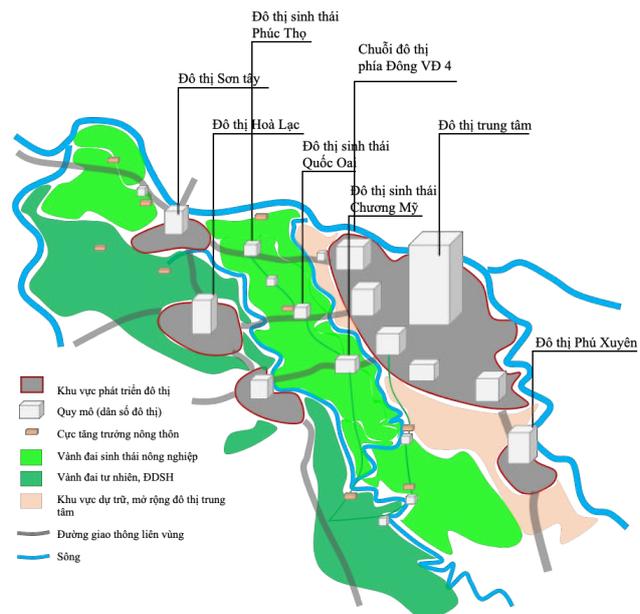


Figure 3.5: Organizational graph of Urban Development theme framework

3.3.5. Organized according to the Mixed Spatial Theme Framework

a) Main goals: (1) optimize mixed spaces according to the green, smart and sustainable transformation model; (2) linking mixed spaces to create a spillover effect to maintain a sustainable green corridor in the west of Hanoi.

b) Conditions: Multi-industry and multi-functional linkage to complete and unify across sectors and fields; overcome overlaps and conflicts between plans when prepared separately at district or commune level.

c) Spatial organization: (1) GREEN mixed space (natural, agricultural, heritage): Ba Vi and Huong Tich mountain areas integrating biodiversity conservation and spiritual tourism; (2) Mixed agricultural - rural village space: along the basin of the Day River, Tich River, large lakes Dong Mo, Suoi Hai, Xuan Khanh, Quang Son, integrating the establishment of biodiversity conservation corridors and management synthetic water, ecological agriculture, urban agriculture, agricultural village, eco-tourism, regional amusement park, outdoor sports area with spaces...; (3) Mixed agricultural - craft village - urban space between Day River and Tich River: clusters of points around National Highway 32, Thang Long Avenue, National Highway 6 integrating craft villages, innovation clusters, craft streets, commercial streets, relic landscapes (Thay Pagoda, Tay Phuong Pagoda, Hundred Gian Pagoda...), agricultural landscapes form the center of rural growth; (4) Mixed agricultural space - craft villages of Ba Vi and Son Tay: on National Highway 32, integrating craft villages, innovation clusters, hilly agricultural landscapes, cattle raising and perennial crops; (5) Mixed agricultural space - craft villages of Thanh Oai, Ung Hoa, My Duc: on Highway 21B integrating craft villages, innovation clusters, and regions low-lying agricultural

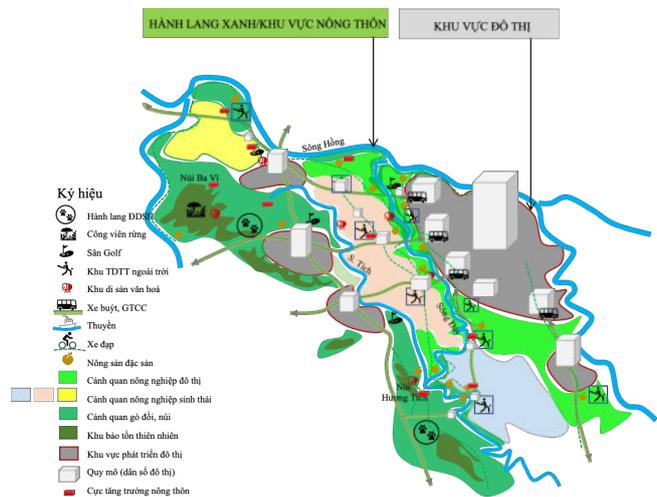


Figure 3. 6: Organizational graph of mixed space theme framework of the western green corridor of Hanoi

landscape, aquaculture; (6) Urban-industrial landscape space west of Ring Road 4 and along the National Highway 1 and National Highway 1 corridors: integrating craft villages, industrial markets, urban areas, urban agricultural landscapes, and other outdoor sports entertainment area (Golf, tennis, football...), national or city infrastructure.

3.4. Management solution for green corridor development in the west of Hanoi

- The set of control criteria includes 4 groups of criteria with component criteria: (1) group of criteria to determine conservation components (nature, heritage, lifestyle); (2) group of criteria to determine development components (rural villages, small-scale industrial farms, urban areas and new construction areas); (3) group of development control criteria (human and nature, attractive landscape value, natural ecological diversity, sustainable agricultural development); (4) group of criteria on transforming green corridor development models (level of urban planning and development, transforming development models).

- Develop management tools to develop the green corridor west of Hanoi: (1) strategy to develop the green corridor west of Hanoi to overall manage the green corridor west of Hanoi according to a multi-sectoral approach (environmental space, economic space, social space, green corridor management and control of green corridor space); (2) urban and rural planning at all levels: inter-district, district, commune level; (3) development regulations with two objectives: (i) green corridor to separate and prevent urban expansion; (ii) green corridor for growth, smart, and sustainability.

3.5. Discussions about the achieved results

(1) Discussing the application of research results in urban and rural planning: Research results provide scientific arguments to answer the issues raised in the Adjustment of planning for the 2021-2030 period with a vision 2050. Provides methodology applied to research content in urban and rural planning in Hanoi.

(2) Discussion on applying research results to manage the development of the green corridor west of Hanoi: Model for developing the green corridor west of Hanoi towards economic, ecological and social transformation (continued) new approaches to sustainable development); Solutions to organize space according to main space themes; The effectiveness of models, solutions, and practical applications.

(3) Supplementing scientific research theories on types of urban green spaces and controlling spontaneous urbanization spread: Adding theories related to the green corridor west of Hanoi on the current situation and The process of transforming mixed spaces in green corridors has unique characteristics of Asian urban areas; Supplementing theory on green corridors. From green corridors to prevent diffuse development between urban areas to green corridors that combine separation to prevent diffuse development between urban areas and sustainable, smart growth; Adding a multi-sectoral integrated planning approach, establishing a Thematic Framework to synthesize and analyze main influencing factors; Deeply linking the chain of information, data, and influencing factors as an important foundation for deciding to organize the green corridor space in the west of Hanoi.

CONCLUSION AND RECOMMENDATIONS

1. Conclusion

Research on the organization of urban green corridor space is a new issue in scientific research in Vietnam. Urban green corridors are essential for urban planning and development in Vietnam. In the current trend, urban areas are tending to stick together into large solid patches, encroaching on natural and cultural spaces. need to be protected during the urbanization process. The results of the thesis have met the research purposes as follows:

- Research on the overall organization of green corridor space, green belts in the world and Vietnam, characteristics of the West of Hanoi where the green corridor model

is applied: a mixed urban and rural space in development. The process of rural urbanization transition, many differences with the world, but similar to Asia.

- Research to identify the current status and characteristics of the main types of organizations today: không gian xanh (Natural and agricultural); Traditional and heritage villages; Small-scale handicrafts and craft villages; on-site urbanization with low density; Other types of mixed space (Mixed space).

- Research the values of using the "symbiotic space" model to scientifically organize activities of mixed functions in the green corridor space of Hanoi West. From there, a theoretical and practical basis is formed for spatial organization according to thematic frameworks of green corridors at small and medium scales. This is also a new result contributing to the transformation of traditional village and production space in the Western green corridor to a new model, adapting to urbanization-industry, digital transformation and climate change.

- Finally, research perspectives, principles, models, and solutions for spatial organization and management of green corridor development in the west of Hanoi (in terms of function and structure) according to thematic frameworks and indicators. basic planning objectives (land use, infrastructure, landscape space) and organize implementation according to the planning.

The thesis Organization of green corridor space in the west of Hanoi has comprehensively researched the origins, present and future of the green corridor in the west of Hanoi, achieving the requirements of perspective, content and results from From a scientific perspective on spatial organization, it is possible to comprehensively answer the existence and adaptive development of the Western green corridor in the next planning stages of Hanoi.

2. Recommendations

(1) To conform to the common world terminology, it is proposed to change the names of Hanoi green corridor and Hanoi green belt; and Hanoi Planning has 2 green belts: the small green belt inside is the Nhue River green belt and the large green belt outside is in the suburban rural areas; (2) Adding to the system of documents promoting the development of green corridor and green belt models to prevent diffuse development and merger of urban areas; (3) Recommendations on issues that need further research: (i) The green corridor and green belt model needs to be researched at the national level, learning from experiences from England, Barcelona and Korea; (ii) The thesis focuses on researching the organization of green corridor space in the West of Hanoi at the inter-district level, which is not yet complete for the district and commune levels; It is recommended to continue research at district and commune levels; (iii) Continue to research in quantifying way about the size of population threshold and environmental ecological threshold./.

REFERENCES

1. **“Green corridors in sustainable urban development structures”**, Construction Planning Magazine; ISSN 1859 – 3054.
2. **“Characteristics and values of rural settlements west of Hanoi”**, Construction Planning Magazine; ISSN 1859 – 3054.
3. **“The difference between peri-urban development models in the US and Europe”**, Construction Planning Magazine; ISSN 1859b- 3054.
4. **“Urban agriculture development model - experience in some Vietnamese urban areas”**, Construction Planning Magazine; ISSN 1859 – 3054.
5. **“Overview of peri-urban areas of large cities in the process of rapid urbanization”**, Construction Planning Magazine; ISSN 1859 – 3054.
6. **“Thinking about innovating planning work in suburban areas of large cities in Vietnam”**, Construction Planning Magazine; ISSN 1859 – 3054.
7. **“Concepts and issues of peri-urban areas of major cities in the world and Vietnam”**, Construction Planning Magazine; ISSN 1859 – 3054.
8. **“Proposing orientations for the development of Vietnam's urban system in the period to 2035 towards multi-sectoral integration”**, Construction Planning Magazine; ISSN 1859 -3054.
9. **“Sustainable development planning for new construction areas in Hanoi's suburban areas during the integration process”**, Construction Planning Magazine; ISSN 1859 – 3054.
10. **“The process of building new rural areas in Japan and lessons for Vietnam in management and development planning”**, Construction Planning Magazine. ISSN 1859 – 3054.

