

MINISTRY OF EDUCATION AND TRAINING

MINISTRY OF CONSTRUCTION

HANOI ARCHITECTURAL UNIVERSITY

DAO PHUONG ANH

**LIVING SPACE COMPOSITION OF RURAL
SETTLEMENT IN HANOI'S GREEN CORRIDOR**

Specialization: Architecture

Code: 62.58.01.02

SUMMARY OF DOCTORAL THESIS

Hanoi - 2019

The dissertation is completed at Hanoi Architectural University

Academic supervisors:

- 1. Assoc Prof. Dr. Trinh Hong Doan**
- 2. Assoc Prof. Dr. Luong Tu Quyen**

Reviewer 1:

Reviewer 2:

Reviewer 3:

The dissertation is defended at Hanoi Architectural University.

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INTRODUCTION

1. Rationale

Rural construction is a key task with economic - political - social significance, bringing about essential benefits for rural people (accounting for about 70% of the nation's population). Therefore, the topic of rural areas has been chosen for many thesis and scientific studies. However, the topics mainly focus on two levels: rural settlement planning and rural housing design. Thus, there exists an intermediary gap between rural settlement and rural houses (living space) that has not been studied or organized.

Moreover, the planning of rural settlement currently only focuses on solving technical and infrastructure factors without paying full attention to the quality and identity of living space. This creates the opposition in structure, image and identity in rural settlement; causing a lack of linkage in the rural community itself and between rural and urban.

In addition, the specific feature of Hanoi planning is that the green corridor; with the functions of separating, limiting the threshold of urban development; creating landscape, living environment; thereby forming the identity value for Hanoi. Therefore, the green corridor is the factor that forms the identity for the rural settlement in Hanoi. Thus, the living space composition of rural settlement in Hanoi's green corridor is extremely necessary.

2. Subject and scope of research

Subject of research: Subject of the study is living space and rural houses of the rural settlement in Hanoi's green corridor.

Scope of research

Scope of space: Hanoi's green corridor under the Hanoi Capital Construction Master Plan (Decision No. 1259 / QĐ-TTg dated July 26, 2011).

Scope of time: The thesis carries out the research in the period to 2030, with a vision of 2050 according to the general planning of Hanoi Capital Construction Master.

3. Purposes of research

The research proposes solutions for organizing living space of rural settlement in Hanoi's green corridor, to promote the role of the green corridor;

improve living conditions and livelihoods; develop the rural settlement harmoniously and friendly; maintain traditional rural values.

4. Research methodology

The thesis uses the methodology of systematic analyzing and approaching; map overlaying; expert method; site survey; statistics and comparison; forecasting.

5. The scientific and practical significance of the topic

Scientific significance

Give scientific arguments about the organizing living space of rural settlement and rural housing design in Hanoi's green corridor. At the same time, propose new solutions suitable to the nature of the green corridor and sustainable development trends.

Practical significance

Research results will add the reasoning in the implementation of green corridor policy; impact on planning, organizing living space and housing design of rural settlement in Hanoi's green corridor.

6. New contributions of the thesis

- Identify the nature and value of Hanoi's green corridor; role of rural settlement for sustainable development and urban identity of Hanoi.
- Proposing the six-step principle and procedure for organizing living space of rural settlement in Hanoi's green corridor.
- Proposing solutions to organizing living space and designing rural houses of rural settlement in Hanoi's green corridor.

7. Concepts used in the thesis

Rural settlement; living space of rural settlement; Green corridor; Green belt.

8. Structure of the thesis

The thesis consists of 3 parts: Introduction; Content; Conclusions and Recommendations. In particular, the content of the thesis consists of 3 chapters: chapter I (38 pages); Chapter II (41 pages); Chapter III (62 pages).

CONTENT

CHAPTER I: OVERVIEW OF LIVING SPACE COMPOSITION OF RURAL SETTLEMENT IN HANOI'S GREEN CORRIDOR

1.1. Comparing Hanoi's green corridor, green corridor and green belt

During the research process, the thesis found the difference between Hanoi's green corridor and green corridor. Moreover, some Vietnamese authors have applied the experience of green belt for Hanoi's green corridor. Therefore, it is necessary to compare three green space to find out the nature of Hanoi's green corridor. Comparison based on definition; shape; location; size; function; development control; meaning of that green space.

Conclusions: Based on the idea of green belt, Hanoi Master Plan to 2030 proposed a typical green space suitable to Hanoi conditions. However, "conservation-based balanced development" and "developing Hanoi's green corridor more flexible than green belt" is the idea and orientation of Hanoi planning. In order to maintain the Hanoi's Green Corridor, it is necessary to set up specific development solutions and targets. Research of spatial organization experience in rural residential areas in the world green belt is necessary.

1.2. Living space composition of rural settlement in world green corridor

Tokyo, Beijing, Seoul, London are chosen because: London has the most successful green belt in the world. Tokyo green belt suffered heavy defeat. Beijing and Seoul have conditions similar to Hanoi. Lessons include:

Development control policies: Rural settlement in the green belt need to establish boundaries and regulations for development management

Increasing the accessibility: Because, green belt also provides fresh green space, beautiful landscape, entertainment place.

Living space composition: World green belts do not allow the construction of new rural settlement. Living space organization is essentially a renovation to the existing settlement.

Rural housing design: In the world green belt, new construction and renovation of existing houses must comply with specific regulations and norms.

1.3. Existing situation of living space composition in rural settlement in Hanoi's green corridor

Existing situation of living space organization in Table 1.1.

Table 1.1: Exiting situation of living space organization of rural settlement in Hanoi's green corridor

GREEN CORRIDOR	Construction area is large
	Development is not consistent with the goals of the green corridor
	Rate of agricultural land is low
	There are many projects
LIVING SPACE	Distributed spread and densely
	Area scale is diverse
	The trend of connecting with each other is increasing
	The traditional structure is broken
	Population density is high, construction density is high
	Landscape is messy, environment is polluted, infrastructure is not guaranteed
RURAL HOUSING	Houses vary in type and form, but lacks identity
	Traditional houses are few with degraded quality
	The area of the campus is decreased, the construction density is increased
	Functional layout in the campus is not appropriate
	The community linkage declines

1.4. Relevant research works

Researches have focused on the nature of green corridor. However, the new solution is only at the orientation level. Rural settlement continue to be urbanized, agricultural land is still used for development; seriously affecting the quantity and quality of green space of Hanoi's green corridor.

1.5. Remaining problems need to be studied

Development control policy: The complex situation threatens the feasibility of the green corridor. Related researches still allow new construction; extension; urbanization of rural residential areas. Therefore, to maintain the green corridor, there should be a development control policy.

Increasing the accessibility: To increasing the accessibility, the green corridor must have many interesting and attractive destinations; diverse transport connections, especially public transport system, walkways.

Living space organization: Rural settlement are causing disruptions and breaks for the green corridor. Development control helps to prevent the negative developments, however, it is necessary to renovate the space in rural settlement.

Rural housing design: With spontaneous changes, in the negative direction, at present, rural houses need development-oriented research suitable to the green corridor area as well as new development trends.

CHAPTER 2: SCIENTIFIC BASIS ON LIVING SPACE COMPOSITION OF RURAL SETTLEMENT IN HANOI'S GREEN CORRIDOR

2.1. Theoretical foundations

The thesis studies the theories of urban and rural planning; organizing living space and rural housing design. The theoretical foundations provide reasoning for the nature of space in rural settlement. That is: small scale; high independence; harmony with nature; promoting relations between people and natural environment; integrating economic, environmental and social development objectives; developing rural economy; developing rural house types. However, these are the theoretical foundations of the world and it is necessary to have further research to apply in Hanoi's green corridor.

2.2. Legal foundations

Through studying the legal foundations, it can be seen, although the green corridor is shaped since 2011, but, there is still a lack of legal documents; on green corridor; causing difficulties in management, planning (Table 2.1). There is no distinction between normal rural living space and rural living space in green corridor. Therefore, it is necessary to clarify and emphasize the typical features of rural settlement in the green corridor.

Table 2.1: Living space organization of rural settlement according to legal documents, codes and standards

LIVING SPACE ORGANIZATION OF RURAL SETTLEMENT IN HANOI'S GREEN CORRIDOR	GREEN CORRIDOR	
	EXISTING RURAL SETTLEMENT	Modern and rich infrastructure
		Environmental protection
		Building density up to 60%
	NEW RURAL SETTLEMENT	Modern infrastructure with rich identity
	RURAL HOUSES	House ensures 3 hard factors
		90% houses meet construction standard
		At least 40-50m ² per person
		Maximum height 3 floors
		Ensuring standard, comfort
Suitable for customs, habits and lifestyle		
	Layout of land lot ensures living and sanitation standards	

Orientation of spatial organization of rural settlement in the green corridor according to Hanoi construction master plan up to 2030 is presented in Table 2.2.

Table 2.2: Orientation of spatial organization of rural settlement in the green corridor according to Hanoi Construction Master Plan up to 2030

LIVING SPACE OF RURAL SETTLEMENT IN THE GREEN CORRIDOR	GREEN CORRIDOR	Zoning to manage the conservation and development
		Encouraging the development of tourism types
		Encouraging agricultural development
		Prohibiting activities of urban development and environmental pollution
	EXISTING RURAL SETTLEMENT	Do not expand and restrict the increase of density, height of the developments
		Enhancing the infrastructure
		Limiting the large-scale construction works
		Prohibiting urbanization and environmental pollution
		Maintaining green space, culture, monuments
		Promoting the traditional structure
	NEW RURAL SETTLEMENT	Giving priorities to the residents of handicraft production, services and labor in urban area
	RURAL HOUSES	Encouraging the conservation of traditional architecture
		Low construction density
		Meeting modern living facilities
		Being unified in architecture language
		Overcoming the spontaneous construction situation

Although shaped in the Hanoi Capital Construction Master Plan to 2030, however, the orientation of space organization of rural settlement in the green corridor has many problems:

- The conservation-based development criteria have not been determined
- The control the area of green corridor is not strict
- The projected population for the green corridor is not reasonable
- The development is not consistent with the goal of the green corridor
- The permitted scale of rural residential areas is too large

2.3. Factors affecting living space organization of rural settlement in Hanoi's green corridor

Factors affecting living space organization of rural settlement in Hanoi's green corridor are presented in Table 2.3.

Table 2.3: Factors affecting living space organization

AFFECTING FACTORS	Natural factors	Topography
		Climate
		Hydrology
		Forest ecosystem
	Socio-economic factors	Income levels increase high
		Economic structure shifted towards increasing the proportion of industry and services
		Trades become more diverse
		The number of family members decreased
	Characteristic of living space	Spatial structure is consistent, introvert
		Residential unit is of ecological balance
		Symbol value of landscape architecture space
	House characteristics	Residential unit is ecologically-balanced
		Suitable with tropical climate with monsoon
		Structure of rural house with rooms-lean-tos
		Portable and removable architecture
	Impacts of urbanization	Tendency of concretization becomes popular
		Green and open spaces are narrowed
		Overload of infrastructure system
		Houses are diversified with the tendency to divide land lots following the roads
		House area is decreased, height is increased
		Architecture is changed in a modern way but is still messy, lack of uniformity and identity
		Trend of replacing new materials
	Impacts of the green corridor	Create a type of rural areas in the green corridor, different from the common rural residential area
	Some applicable indicators	Building density
		Proportion of public green space
		Criteria of residential land area
		Building density in the campus
Classification of rural residential areas	According to the distance from the city	
	According to production function	
	According to cultural values	
	According to the suitability with the green corridor	
Classification of rural houses	Classify houses by time	
	Classify houses by occupation	
	According to the suitability of the green corridor	

2.4. Practical experience

Practical experience on development control, increasing the accessibility, organization of living space, and housing design of rural settlement in the green belts of London, Surrey, Birmingham; Aberdeen, Scotland; Seoul, Korea; Beijing, China.

CHAPTER 3: SOLUTIONS FOR LIVING SPACE COMPOSITION OF RURAL SETTLEMENT IN HANOI'S GREEN CORRIDOR

3.1. Opinions and objectives

3.1.1. Opinions

The Hanoi's green corridor is interrupted, broken by rural settlement, due to differences in the nature of the two areas. Therefore, it is necessary to organize rural living space to connect broken sections, improve the quality of green corridor; reinforce the image and identity for Hanoi. The opinion of rural living space composition includes:

- Complying with legal regulations, development orientation, standards
- Contributing to concretize rural development orientation according to the Hanoi capital construction master plan to 2030
- Being consistent with the nature of the Hanoi's green corridor.
- Basing on local practices for effective and feasible solutions
- The rural settlement is developed in a green and sustainable direction.

3.1.2. Objectives

Objective 1: Prevent the expansion and negative development of existing rural settlement, not build new rural settlement.

Objective 2: Typical living space of rural settlement; At the same time, improving living standards and livelihoods for people in the region.

- *Objective 2.1:* Create a low-density, green, environmentally friendly rural living space which is distinguished from urban space.

- *Objective 2.2:* Be consistent with the direction of increasing the accessibility

- *Objective 2.3:* Improve the quality of infrastructure but still ensure to promote the space structure and traditional rural values.

- *Objective 2.4:* Balance economic, social and environmental values.

3.2. Principles and procedures

3.2.1. Principles

- Following the nature and function of the green corridor
- Using rationally natural conditions, limiting environmental impacts.
- Preserving, inheriting, promoting the values of history, culture, identity
- Controlling and limiting inappropriate development
- Following the route, applying multiple solutions synchronously

3.2.2. Procedures

The procedure of living space composition of rural settlement in the green corridor is shown in figure 3.1.

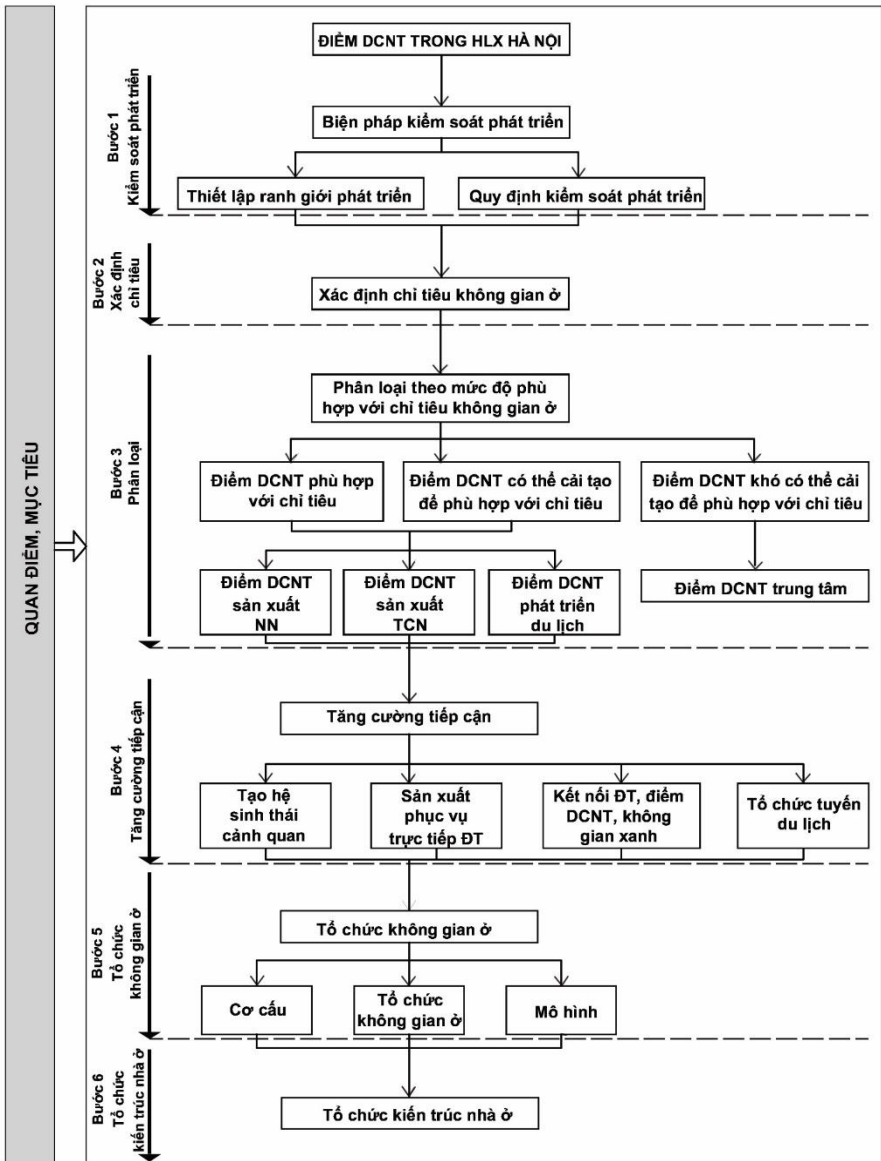


Figure 3.1: Procedure of living space composition of rural settlement in Hanoi's green corridor

3.3. Proposing solutions to composting living space

3.3.1. Proposing development control measures

The thesis proposes development control measures to address objective 1, section 3.1.2. The solutions include:

- Set up development boundaries for rural settlement
- Establish development control regulations.

3.3.2. Determining the criteria for composting living space

Rural settlement after applying control measures will not continue to expand and develop in a negative direction for the green corridor. Next, it is necessary to improve the space in accordance with objective 2, section 3.1.2.

Based on world experience and scientific basis in chapter 2, the current criteria in section 1.3, the thesis proposes some criteria as in figure 3.2. However, due to the complicated situation, the immediate application of criteria will be extremely difficult. Therefore, the application should be made according to a specific time route and for particular regions to ensure the feasibility and effectiveness of the model.



Figure 3.2: Criteria for organizing rural living space

3.3.3. Classifying rural settlement in the green corridor

a. Classify according to the criteria of composting living space

The classification is based on 5 contents (Table 3.1). Rural settlement achieving less than 10 points are difficult to renovate to fit the criteria. From 10-15 points, it is possible to improve the criteria accordingly. Over 15 points, it is easy to renovate in accordance with the criteria.

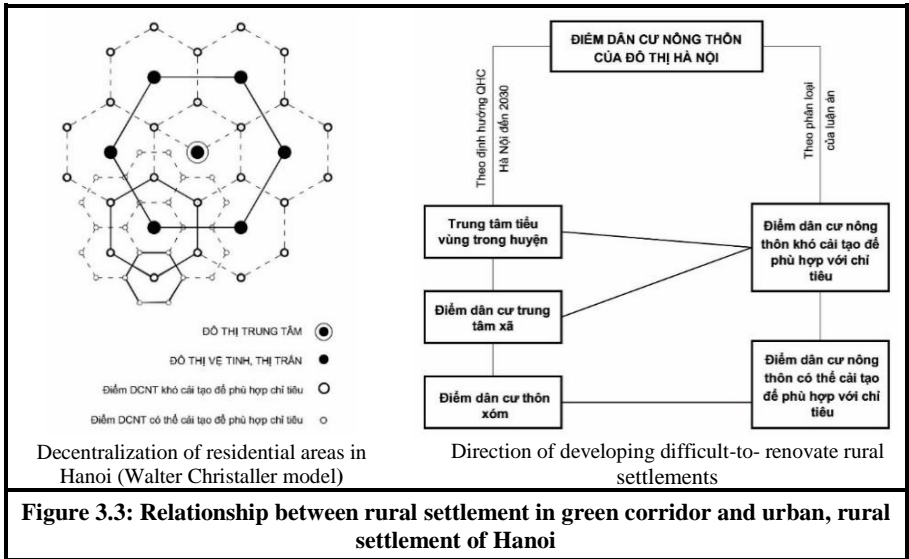
Table 3.1: Classification of rural settlement

Contents	Characteristics, features	Points
Role and significance	Rural settlement with considerable role and significance in the district	1
	Rural settlement with considerable role and significance in a group of communes	2
	Rural settlement with considerable role and significance in the commune	3
	Rural settlement depending on the central rural settlement	4
Area scale	Rural settlement with the area of over 50 ha	1
	Rural settlement with the area of 25-50 ha	2
	Rural settlement with the area of over 10-25 ha	3
	Rural settlement with the area of less than 10 ha	4
Average construction density	Average construction density is more than 30 houses/ha	1
	Average construction density is from 20-30 houses/ha	2
	Average construction density is from 10-20 houses/ha	3
	Average construction density is less than 10 houses/ha	4
Number of storeys	More than 2 storeys reaches from 30- 40%	1
	More than 2 storeys reaches from 20-30%	2
	More than 2 storeys reaches from 10-20%	3
	More than 2 storeys reaches less than 10%	4
Public green space	The ratio of public green space is less than 5%	1
	The ratio of public green space is from 5-7%	2
	The ratio of public green space is from 7-10%	3
	The ratio of public green space is more than 10%	4

Direction of developing difficult- to- renovate rural settlement to fit the criteria of living space organization

According to the Hanoi capital construction master plan to 2030; nuclear units in the green corridor include: district center, sub-regional center in the district, settlement at commune center. Therefore, it is possible to select rural settlement that are difficult to renovate in accordance with the criteria for organizing living space as a sub-regional center and commune center settlement; developing according to the semi-urban model. Although these semi-urban settlements are not expanded, it is possible to increase the construction density, the height of the building and the land use coefficient. This is the place to build public, educational, service and commercial centers for sub-regions or communes.

Thus, in Hanoi's green corridor, there will be rural settlement and semi-urban settlement. In particular, the rural settlement is the object to study of the thesis.



b. Classification by production characteristics

According to the classification in chapter 2, rural settlements classified by the production characteristics include three types: with industrial production; with agricultural production; with tourism development.

Tourism brings many benefits to the rural areas, so more and more rural settlements participate in tourism development. However, for a rural settlements with tourism development, it is necessary to converge many factors (Table 3.2). Rural settlement below 60 points are not eligible for tourism development, from 60-80 points are eligible for tourism development, over 80 points have good conditions for tourism development.

Table 3.2: Evaluation of tourism development potential of rural settlement

No.	Contents	Points	Details	Component point
1	Tourism resources	80	Ancient village with ranking	30
			Traditional handicrafts	20
			Natural resources	10
			Rated historical and cultural relics	10
			Within 3 km of main tourist complex	10
2	Competitiveness	20	Competitiveness with nearby rural residential areas	20
3	Infrastructure	20	Infrastructure for tourism	10
			Rural residential area's infrastructure	10

No.	Contents	Points	Details	Component point
4	Labor Resources	20	Source and qualification of labor	10
			Local economic ability	10
5	Development policy	20	Local policy	10
			Policy of rural residential areas	10
6	Obstacles for of tourism development	-60	Environmental issues	-20
			Issue of land fund for tourism development	-20
			Problem of identity fading	-20

3.3.4. Proposing solutions to increase the accessibility

The green corridor not only has the function of controlling development but also brings aesthetic, recreational and economic value to the city. To maximize that value, it is necessary to increase the accessibility of people (urban and rural) to the green corridor. Solutions include:

- Strengthening landscape and ecological links for the green corridor
- Increasing production for directly serving the urban area
- Increasing the accessibility between urban areas, rural settlement and green spaces in the green corridor
- Increasing the accessibility to tourist destinations

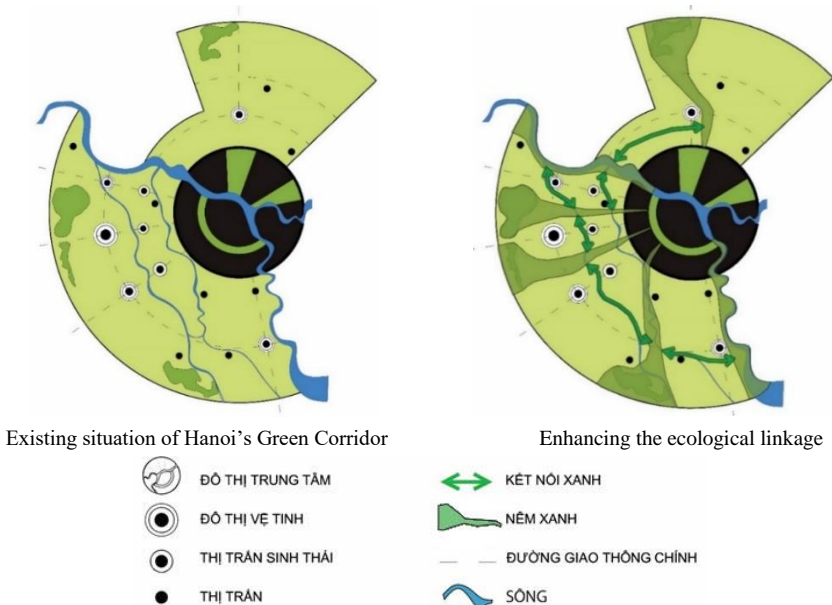


Figure 3.4: Enhancing landscape and ecological linkage for Hanoi's green corridor

3.3.5. Living space organization

a. Organizational structure

The space structure of rural settlements in the green corridor consists of: traditional village space and spontaneous expansion space. Under the impact of development, traditional villages expand, leading to interconnection to create rural settlements with a large area scale. Therefore, rural settlements in the Hanoi's green corridor may include one or more traditional villages.

b. Organization of living space

The solutions of living space organization of rural settlements include:

Improving in the direction of preserving structure and landscape of the alleys and lanes: (1) Arranging roads surrounding rural settlements to reduce the density of the main road without changing the landscape of alleys and lanes. (2) Connect the primary lane with the surrounding road, have an opening to stop the cars from avoiding each other. (3) Organizing a semi-public green lane for secondary and territory lanes without expanding, because cars are not allowed to enter. (4) Organize parking lots. (4) Restoring village gates, hamlets and bamboos, preserve cultural and historical relics. (5) Pave concrete for road foundation and pavements are treated with traditional tiles.

Control landscape architecture

Along the main road and primary lane: each side of road has 15m (main road) and 10m (primary lane) used for landscape control. Existing houses are temporarily conserved but it needs to be adjusted according to regulations. Houses are only allowed to be built if the area is larger than 360 m².

Along existing secondary, tertiary lanes: Organize semi-public green lane, renovate common lane into a semi-public space. The renovation includes: building a gate for the lane; renovate fences; set up lane as a green space.

Along the contour: Do not allow the houses to open the entrance directly into the contour. Encourage planting trees near the fence to create shade and cover the image of construction works in rural residential areas.

Adjusting residential land: The application in Hanoi's green corridor will face many difficulties due to the large construction density; rural land is the land passed from the ancestors for their children, therefore it is more different to converse. Therefore, land adjustment needs separate research; participation and support from stakeholders; and to be implemented according to specific roadmap.

Establishment of a green space system (figure 3.5)

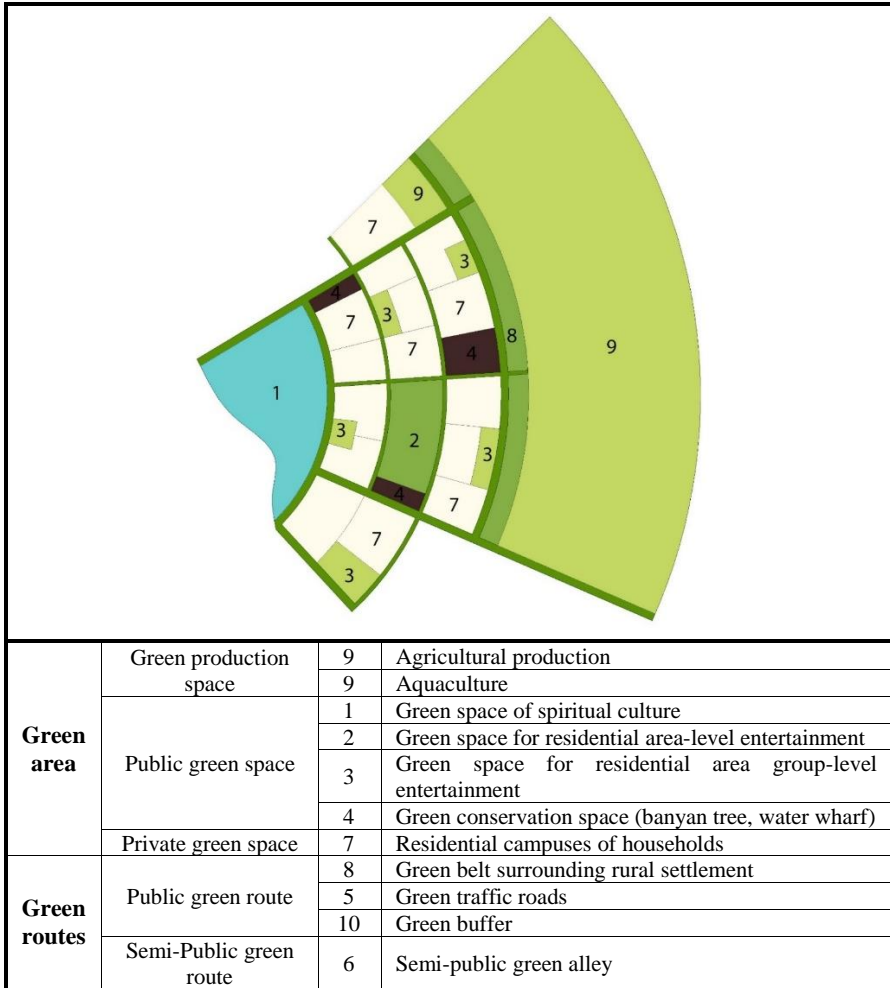


Figure 3.5: Green space system of rural settlement in Hanoi's green corridor

c. Model of living space

The living space model in rural settlement with agricultural production is shown in figure 3.6. The living space in the rural settlement with handicraft production and tourism development has a pattern similar to the model of rural settlement with agricultural production. The difference is mainly due to the criteria of living space, green space and the difference of some public works shown in table 3.3.

Functional space		Rural settlement in the green corridor	Rural settlement with agricultural production
Living space	Maximum density	15 houses/ha	12 houses/ha
	N. of households/semi-public green alley	4 -10 households	4-8 households
Green space		20%	20%
Public space, serving production		10%	10%

Figure 3.6: Living Space in rural settlement with agricultural production

Table 3.3: Criteria for rural settlement with handicraft production, tourism development

Functional space		Rural settlement in green corridor	Rural settlement with handicraft production	Rural settlement with tourism development	
				With agricultural production	With handicraft production
Living space	Maximum density	15 houses/ha	15 houses/ha	12 houses/ha	15 houses/ha
	N. of semi-public green valleys	4 -10 houses	4-10 houses	4-8 houses	4-10 houses
Green space		20%	25%	25%	30%
Ratio		10%	12%	12%	15%
Public space, serving for production	Functional works		Space for display, exhibition, sale of craft products, for trading raw material and material.	Space serving for tourism (hotel, festival space, museum pedestrian street...)	Space for display, exhibition, sale of products, purchasing raw materials, ,serving for tourism

3.4. Rural housing design

3.4.1. Proposing criteria for rural housing design

- Criteria of residential land area: 360m² / household
- Maximum height: 10m. Two - storey house must be built with tile roof
- Building density: maximum 45%.
- Coverage (water surface, green tree): at least 55%.
- Minimum distance from home to field: 50m or 20m thick layer of tree
- Minimum distance from home to main road is 7m, branch road is 5m
- Roof: Tile roof, combined with solar panels;
- Energy efficiency: reducing 30% of annual energy consumption in 2030 and 50% in 2050.

3.4.2. Rural housing classification

Houses in rural settlement in Hanoi’s green corridor are classified as figure 3.7

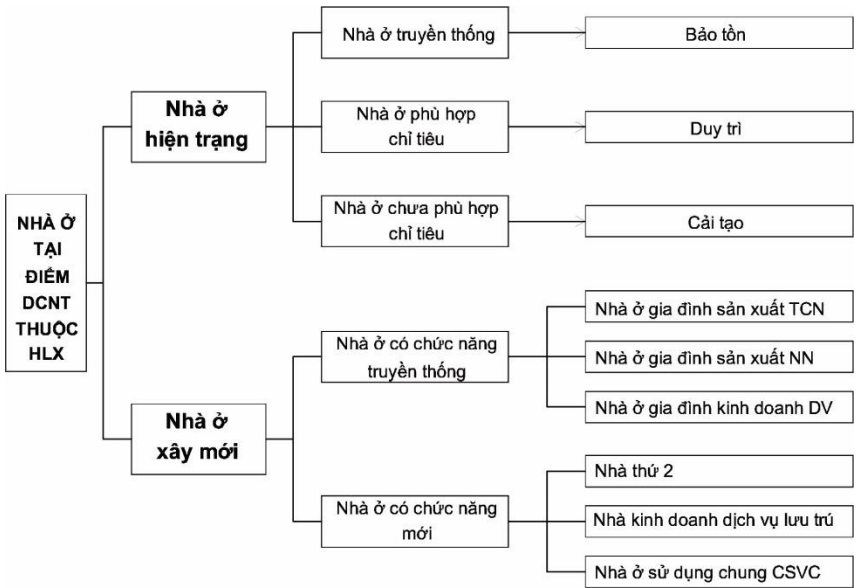
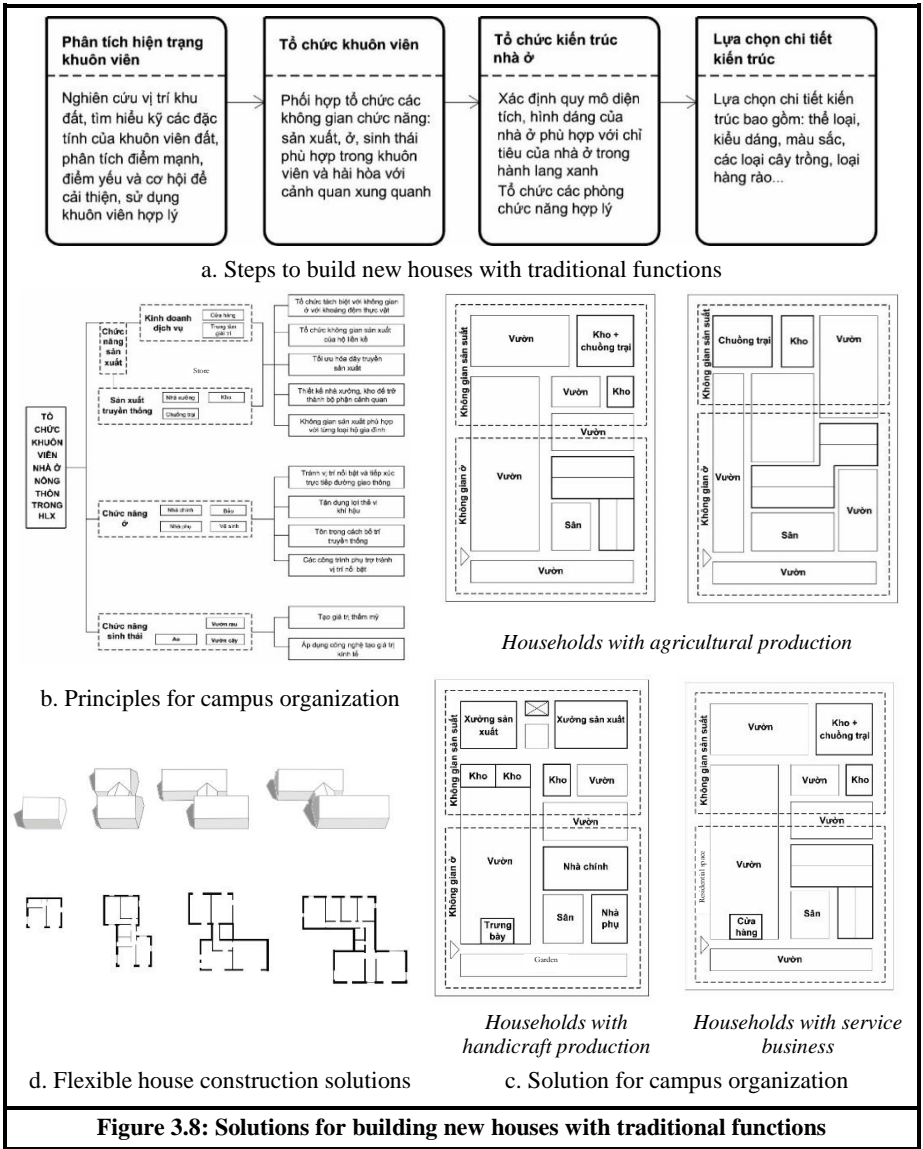


Figure 3.7: Classification of houses in rural settlement in Hanoi’s green corridor

3.4.3. Solutions for building new houses with traditional functions

Although rural settlement in the green corridor are not expanded, it is still possible to build houses in unoccupied land or households divide their land into smaller land plots to build houses. Steps to build new houses are shown in figure 3.8.



3.4.4. Solutions for building new houses with new functions

a. Second houses

Being a rural house which is owned by people living and working in urban areas. Due to the length of stay, the number of second houses does not exceed 30% of the total number of houses in rural settlement.

b. Cohousing

Cohousing are a cluster of houses, each family has its own life but shares some common spaces. This is a reasonable choice for single people, small families, retired elderly people. The thesis proposes that each rural settlement has a maximum of 2 cohousing, include 12-18 families; minimum area of 2400m². Maximum construction density of 35%.

c. Homestay

Homestay is a form of stay that tourists stay and experience life with the landlord. Houses for homestay business includes: categories that allow tourists to stay with the landlord; the type bedrooms provided in a separate location from the landlord.

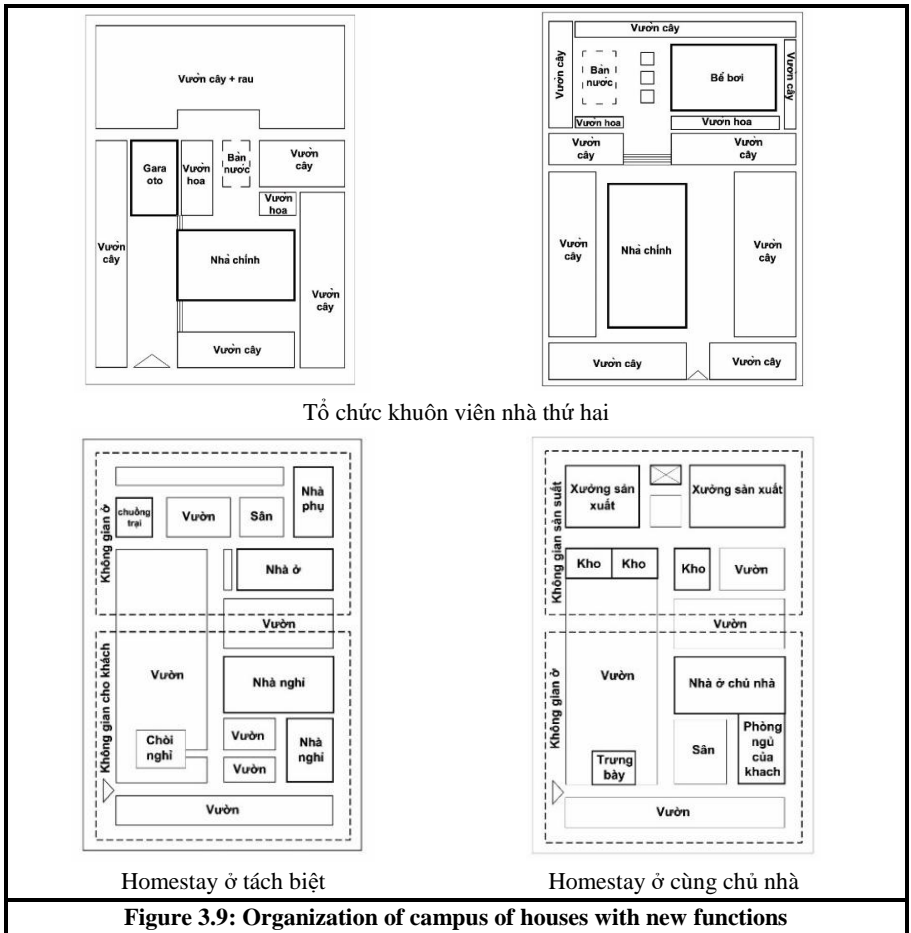


Figure 3.9: Organization of campus of houses with new functions

3.4.5. Solutions to renovate houses which fail to meet the criteria

- Houses which fail to meet the criteria of campus area: applying solutions to adjust land according to specific roadmaps and localities
- Houses which meet campus criteria: organizing the campus and house
- Traditional houses: applying conservation measures

3.4.6. Technical solutions, environment, energy

- a. Environmentally friendly construction methods and materials
- b. Behave with the natural environment

3.5. Research for application

Living space organization of rural settlement of Phu Vinh, Phu Nghia communes, Chuong My district, Hanoi.

a. General introduction

Phu Vinh is located in Chuong My district where is famous for its bamboo and rattan industry. In 2009, Phu Vinh's population was 2585 people, natural area was 79.7 ha, agricultural land was 53.9 ha, accounting for 68%; construction land is 25.8 ha, accounting for 32%.

b. Existing situation of Phu Vinh

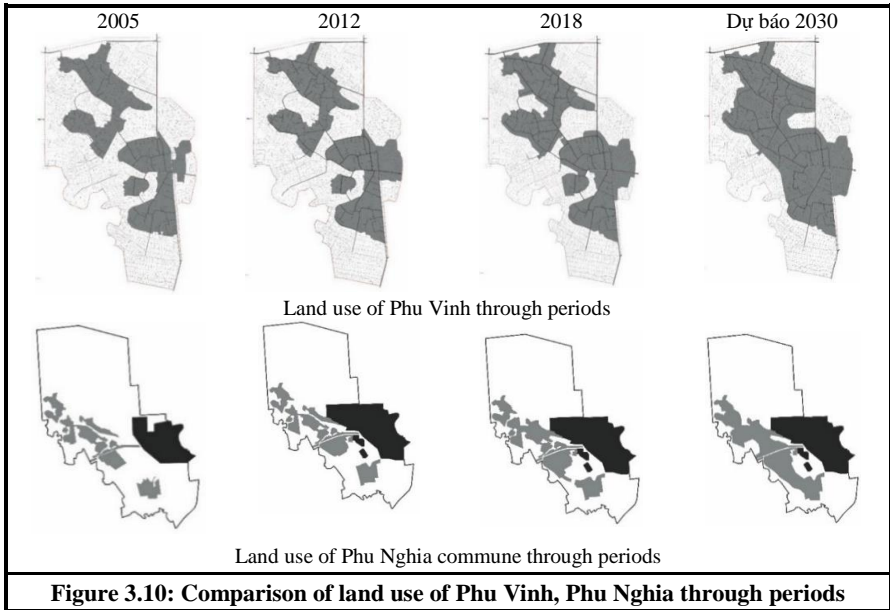
- Continuously expanding spontaneously (figure 3.10)
- Construction density is high (figure 3.10)
- The area of green and water space is reduced, lack of connection
- Rural houses have many problems
- Have messy landscape, patchwork traffic, degraded infrastructure
- Not attractive to tourists yet

c. Values with potential for exploitation of Phu Vinh

- Value of traditional trade villages
- Value of traditional rural space
- Value of traditional architecture
- Value of ecology

d. Problems to be solved

- Prevent the spontaneous expansion
- Maintain the existing construction density, reduce density in the future
- Renovate, open more, connect with green space, water surface;
- Renovate, link cultural and historical works and valuable destinations.
- Improve traffic, but still maintain the traditional structure
- Connect with green space, public, tourist routes of the city.



e. Solution of spatial residential organization of Phu Vinh

Development control: Establish development boundaries for Phu Vinh (Figure 3.11); Establish regulations for development control (section 3.3.1)

Determining criteria for organizing living space (table 3.4)

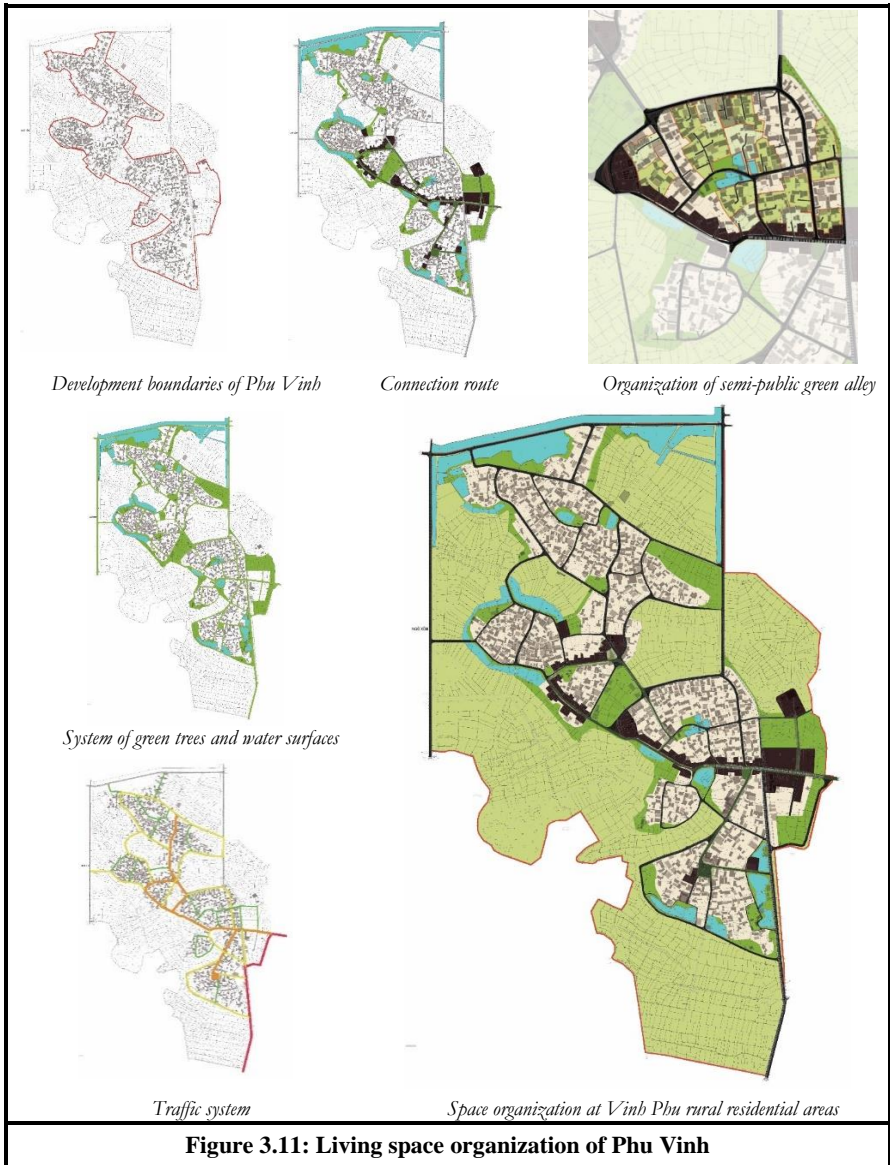
Table 3.4: Space criteria in Phu Vinh rural settlement

Living space		Minimum green space	Public space	
Maximum density	Number of houses/groups		Ratio	Functional works
15 houses/ha	4-10 houses	30%	15%	Displaying, exhibiting, selling products, trading tourism materials, services...

Classification: According to the conformity level with the criteria, Phu Vinh achieved 12 points. According to the potential of tourism development, it achieved 65 points. Therefore, Phu Vinh is a rural settlement that can be renovated to fit the criteria and has enough potential for tourism development.

Enhance the accessibility: increase ecological linkages, production to serve for urban areas, increase the accessibility to tourist destinations.

Organization of living space: Improve towards preserving structure, controlling landscape, adjusting land, establishing green space, public space.



3.6. Discussing about research results

Discuss about the nature of Hanoi's green corridor: Hanoi's green space system includes: green corridor, green belt, green wedge and urban parks. In particular, green corridor and green belt have the similar function. Moreover, in some researches, the authors have applied the experience of green belt to

Hanoi's green corridor. In addition, the development part of green corridor is 43% consisting of many complex components. Therefore, identifying the nature of Hanoi's green corridor is necessary.

Discuss about the process of living space organization: Hanoi's green corridor has a large area (2056 km², more than 2 times the central urban area), so the solutions need to be highly generalized. Some urban areas have brought green corridors and green belts into planning structures such as Hai Phong, Vinh Phuc and Bac Ninh. Due to the similar location and conditions, the residential space organization steps can be applied in the above cities.

Discuss about the quality and management of green space: The thesis proposes a large proportion of green space connected to create a complete ecosystem. However, this proportion does not reflect the true quality of green space, the diversity of ecosystems. Besides, managing the existence of this system is very difficult. Researches on compensation, clearance of residential land and agricultural land to establish green space should reflect the real value of land so that it can receive support from the community.

Discuss about the application of living space criteria: Based on the overview research, legal foundations, theoretical foundations, practical experience, the thesis proposes a system of criteria for living space and rural houses in green corridor. However, the complexity of rural settlement makes it very difficult to immediately apply. Therefore, it is necessary to have a process for implementing according to short-term and long-term plans in each specific area to ensure the feasibility and effectiveness of the model.

CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

Rural areas of Hanoi are located entirely in green corridor. Although the rural settlement system is only one of eight functional areas and only accounts for about 10% of the total area, it plays an important role, deciding the success or failure of the model. However, rural settlements are an unsustainable functional component; causing breakages and disruptions to green corridor due to the fundamental differences in the nature of the two areas. Therefore, rural settlement need to be developed in the way to ensure that it at the same time meets the following objectives: (1) to develop in the direction of connecting the broken sections to ensure the existence and development of the green corridor; (2) develop the economy; (3) maintain traditional rural values.

Based on world experience; research on the existing situation, the thesis identifies the nature of Hanoi's green corridor. Thereby, it proposes the direction for living space organization of rural settlement including 6 steps: development control; defining criteria; classifying; increasing the accessibility; organizing living space; rural housing design.

After following the above-mentioned procedures, the rural settlement will achieve the typical feature of the green corridor, different from the normal rural settlement. Accordingly, rural settlement are of moderate size, suitable to traditional structure; low construction density; no extension development; not allowing urbanization; managing the green space system with layers and levels which are closely connected. Originating from the characteristics in the residential space, the rural housing design also needs to comply with strict requirements to contribute to achieving the common goals.

2. Recommendations

Hanoi's green corridor is a complex area with many functional components. The research of living space organization of rural settlement only solves one of eight functional areas. If other functional areas are not well organized, Hanoi's green corridor cannot be maintained. On that basis, the thesis proposes some research directions as follows:

- Organizing a green space system in Hanoi's green corridor
- Organizing parks and entertainment spaces in Hanoi's green corridor
- Planning the network of tourist resorts in Hanoi's green corridor

In Hanoi's green corridor, there are many development projects, industrial complexes and new urban areas. This is a functional area which is not suitable for green corridor, it is necessary to have a zoning plan to limit development, relocation of such works to leave the room for the development of green space. Therefore, the second research direction may be:

- Developing the management policies for functional areas which are not in line with the green nature of Hanoi's green corridor.

The thesis only focuses on the organization of residential space, the other spaces have been mentioned but very limited and general. Therefore, the next research direction is:

- Organizing public space of rural settlement in Hanoi's green corridor
- Organizing the production space for rural settlement in Hanoi's green corridor.

PUBLICATIONS

1. Dao Phuong Anh, *Several Issues Related to Development of Hanoi Green Corridor in the Urbanization Context*, Science Journal Architecture and Construction, No. 22, 2016.
2. Dao Phuong Anh, *Hanoi Green Corridor planning: the problem of development control*, Journal Construction planning, Vietnam Institute for Urban and Rural planning, Ministry of Construction, No 81, 2016.
3. Dao Phuong Anh, *Organizing living space of rural settlement in Hanoi Green Corridor*, Journal Construction planning, Vietnam Institute for Urban and Rural planning, Ministry of Construction, No 87, 2017.
4. Dao Phuong Anh, *Organizing green space of rural settlement in Hanoi Green Corridor*, Scientific conference “Integration in planning training, Urban and Rural planning Faculty, Hanoi Architecture University”, 2017. ISBN: 978-604-82-2298-7.