

Proposing Criteria for Green Neighborhood in Vietnam

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Abstract—The issue of climate change is becoming more and more acute today, the trend of green architecture is an inevitable direction to mitigate the impacts of climate change. The green building evaluation criteria are positive factors to help architects orient the design towards sustainability, but the criteria for evaluating a green neighborhood have not been paid attention yet. The article introduces issues, principles of proposed criteria and specific evaluation criteria for a green neighborhood.

Index Terms— Green neighborhood, Criteria, Vietnam

I. INTRODUCTION

The term sustainability was first mentioned in 1980 in the Declaration of The International Union for the Conservation Strategy - UCN in Switzerland entitled World Conservation Strategy. In which, sustainability is considered as an inseparable link of development [1]. However, after that, there were many debates about economic progress and environmental protection, as well as the limited impact of the Strategy on national policies, so this concept has not been given due attention.

To unify operations on a global scale, the United Nations established the World commission on Environment and Development in 1987. The council produced the famous document under the name of the Brundtland Report Declaration. The document provides a principled definition: "Economic growth should be managed so that natural resources are used so that the life of future generations is secure. Sustainable development encompasses political and socioeconomic development paths that meet the needs of the present without compromising the needs of future generations" [2].

Green architecture is architecture that develops sustainably and ensures the most complete comfort conditions for people to live, live and work in it. But it consumes the least energy and resources, emits the least carbon dioxide, protects the environment and ensures a harmonious relationship between people and nature. After nearly 30 years of developing the green architecture movement, all participating countries have a system of criteria for evaluating green buildings [3]. However, the system of criteria for evaluating green neighborhood in Vietnam has not yet been proposed. This paper outlines principles and proposes green neighborhood criteria for Vietnam.

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II. SUGGESTING PRINCIPLES

The Criteria System "Green Neighborhood " is a further development of the "Green Housing" evaluation system to build a neighborhood in the direction of ecosystem conservation, environmental protection, improvement energy efficiency, utility and quality of life of the people.

The fields of the criteria system "Green Neighborhood " include:

- The location of the neighborhood is in relation to the urban area and the regional ecological system
- Utilities of the neighborhood related to essential service works and community living space in both material and spiritual terms
- The infrastructure of the neighborhood ensures the best life of the people.
- Managing the operation process in order to maintain and develop the neighborhood in a more and more "Green" position. Usually the "Green Neighborhood" certificate has to be reviewed after 5-7 years.

Determine the proportion of rating points of the areas based on the analysis of the importance level to the material and spiritual life of the people in the accommodation unit. The three most important contents are the convenience of residents, the ecological environment and the green quality of each building.

The criteria must have quantitative criteria for assessment and classification, suitable to the current economic, social, climate, construction and lifestyle conditions of Vietnam.

III. PROPOSING CRITERIA FOR GREEN NEIGHBORHOOD IN VIETNAM

No	Criteria
I	Construction site and ecosystem – 20 points
I.1	Residential neighborhood: Preserving the existing ecosystem, ensuring the future development of the region's ecosystem and biodiversity
I.2	Construction of neighborhood that do not affect or change the natural ecosystem of the site and adjacent areas: preserving rivers, streams, lakes, ponds, forests and orchards
I.3	Ensuring Biodiversity
I.4	Construction of neighborhood does not affect the surrounding landscape (temples, pagodas, shrines, mausoleums, relics, landscapes, ...)
I.5	Harmony with nature and surrounding works and landscapes
I.6	Protection of neighborhood against climate change: flooding, erosion, storms, ...
I.7	Reasonable land use: do not build on land with agricultural/forestry value, land with high ecological value. Renovate contaminated land for construction
II	Utilities Neighborhood – 40 points
II.1	Planning and architecture in the neighborhood are

	arranged in a reasonable manner: catching cool wind, avoiding cold and hot wind
II.2	Within 500m, there are enough essential utilities and services: Kindergarten; Primary School; Supermarket / Market; Post office; Bank; Ward government headquarters
II.3	There are walking paths, bicycles for people's daily exercise
II.4	There is more than one public bus station 500m away to places in the City
II.5	There is an elevated railway station or an urban metro station less than 1000m away
II.6	Energy-efficient lights for lighting outside residential areas (pathways, parks, playgrounds, etc).
II.7	Green landscape: Restore lost ecosystems, beautify the area's landscape: create more gardens, water surfaces, botanical gardens, etc.
II.8	There are solutions to combat urban heat island effect: Planting shade trees, creating gardens, green carpets, permeable surfaces...for at least 50% of the hard surface of the construction site
II.9	Reasonable service fees, no complaints from residents
II.10	More than 75% of occupants are satisfied with the planning of the residential unit and the organization of the apartment's architectural space
II.11	Not affected by harmful gas and noise from the surrounding area
II.12	There are walking paths, playgrounds, gymnasiums and sports fields for all ages.
II.13	There is a park, communication/meeting ground within 500m
II.14	Having a community house, meeting place, enjoying holidays, Tet
II.15	Enough parking space (motorcycles, cars) for residents and visitors
II.16	Waste is collected and removed from the living area daily, without causing odor or gas pollution
III	Green Apartment – 25 points
III.1	Energy Efficiency
III.2	Use of renewable energy, local energy (solar energy, wind energy, water energy, bioenergy)
III.3	Reducing water supply for buildings
III.4	Rainwater collection and use
III.5	Green roof, green veranda, green yard in the apartment building
III.6	Waste water treatment for reuse (watering plants, washing cars...), on-site wastewater treatment, reducing wastewater entering the urban drainage system
III.7	Use of local materials, quick recovery materials, recycled materials, unburnt materials
III.8	Indoor microclimate comfort
III.9	Sanitary air environment
IV	Green infrastructure – 10 points
IV.1	Sufficient clean water supply system, stable operation
IV.2	Sufficient power supply system, stable operation
IV.3	Information, television, and Internet systems operate stably
IV.4	Stable operation of wastewater drainage system
IV.5	Collecting rainwater in the land for use and preventing flooding
IV.6	Not being flooded after heavy rains

IV.7	Clean and sanitary roads, parks, and playgrounds
V	Management of Neighborhood – 5 points
V.1	Cultural, clean, orderly and hygienic residential area
V.2	Having a program to maintain and improve the “quality of green residents”
V.3	Cultural, solidarity, safe and secure residential area
VI	Creativity - (+10 points)
VI.1	Innovative planning and architectural design solutions to achieve the criteria
VI.2	Innovative management solutions to maintain the quality of green residential areas

IV. CONCLUSION

The proposed green neighborhood criteria from the point of view of sustainable development include the following areas: construction site and ecosystem, utilities of the neighborhood, green apartments, green infrastructure, neighborhood management, creativity in design and construction.

In which, considering the convenience of the neighborhood with the living characteristics of Vietnamese people as the most important, accounting for 40% of the total points. Green infrastructure accounts for 10% of the total score and green apartments are an important part of the Neighborhood accounting for 25% of the total score in the overall assessment and criteria for management of neighborhood accounted for 5% of the total score.

Criteria for green neighborhood is an important orientation to set out design principles, models and solutions for spatial organization when designing. These criteria ensure that the neighborhood achieves its goals of saving energy, increasing the ecological diversity of the area, reducing the phenomenon of urban heat islands, and helping residents have a healthy green lifestyle.

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REFERENCES

- [1] IUCN–UNEP–WWF, *World Conservation Strategy: Living Resource Conservation for Sustainable Development*, 1980
- [2] United Nations World Commission on Environment and Development *Report of the World Commission on Environment and Development: Our Common Future*. Oxford: Oxford University Press, 1987
- [3] Pham Duc Nguyen, *Sustainable and green architecture development in Vietnam*, Tri Thuc Publishing House, Hanoi, 2012

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