

Towards sustainable housing for Vietnam

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Abstract

- Economic development in Vietnam has led to a **spontaneous development** of new housing **without consideration of environmental protection, cultural suitability, or resource reduction**
- **Challenges:** satisfying growing **housing demand**, confronting **issues of climate change, extreme weather events, nature conservation and cultural heritage**
- Paper presents the result of a **survey and interviews** carried out in Vietnam in 2009 to design model green housing guidelines

Content

- Introduction
- Housing types in Vietnam and their features
- Results of the survey
- Interviews of housing professionals and the discussion for guidelines
- Conclusion



Introduction: issues of current housing design in Vietnam

- Recent economic development in Vietnam influencing housing design in both **quantity and quality**
 - Ho Chi Minh City alone (in 63 cities and provinces of Vietnam): a demand for 7-8 mil sq metres/ year (approx 40,000 new houses) (Ho Chi Minh City Department of Construction, 2010)
 - Limited and delayed innovations in construction methods: slow speed & bad quality of housing (Nguyen, 2005)
- **Lack of consideration** on environment, health, and safety in housing development (Nguyen, 2010)
- **Lack of appropriate codes** for environmental sustainability
- **Serious impacts** of climate change and extreme weather events on the country

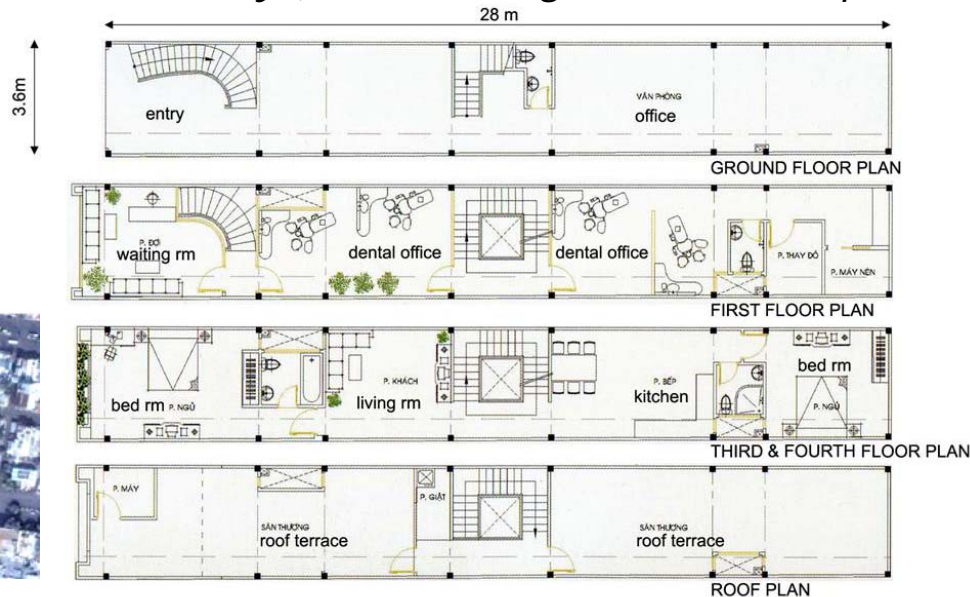
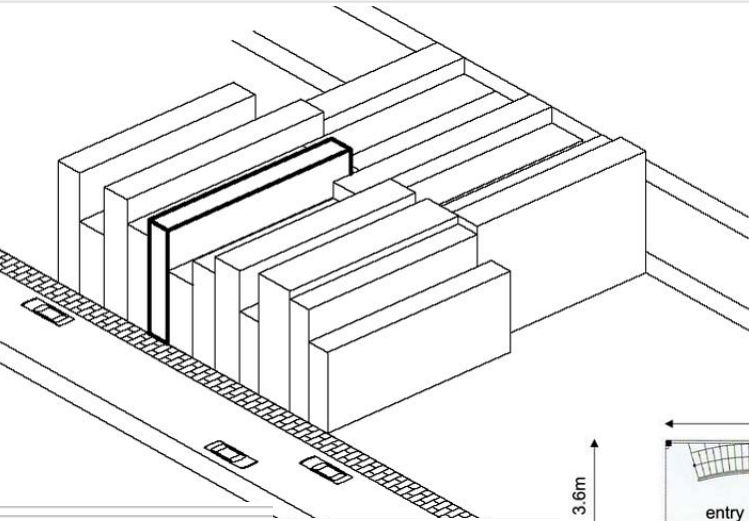
Introduction: necessity of transition towards sustainable housing design for Vietnam

- ❑ **Model green building guidelines** are essential for Vietnam.
- ❑ This research focuses on **current housing context** by using a quantitative methodology.
- ❑ Results of **a survey** with 350 householders' responses from Hanoi, Danang, Ho Chi Minh City and Can Tho and **14 interviews** with architects, builders, authorities, and researchers in Vietnam in 2008-2009.

Housing types in Vietnam and their features

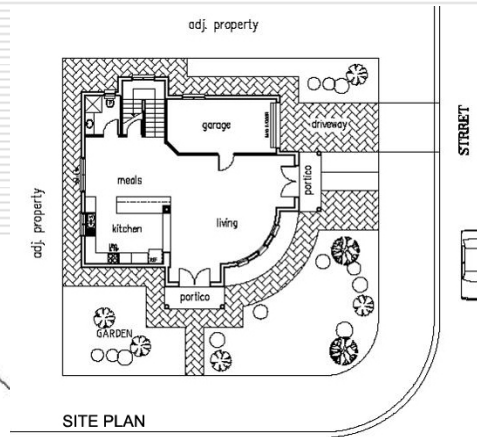
- Urban row house/ street house: a multi-storied structure located in a rectangular plot which has a width much shorter than its length, connecting to a street or alley on its one narrow side, with the dedication of a part or whole of the ground floor areas for retail shops or an office.

A row house designed by architect Tran T Khoa in Can Tho City (source: Trong Nhan, 2009, p.64-65).

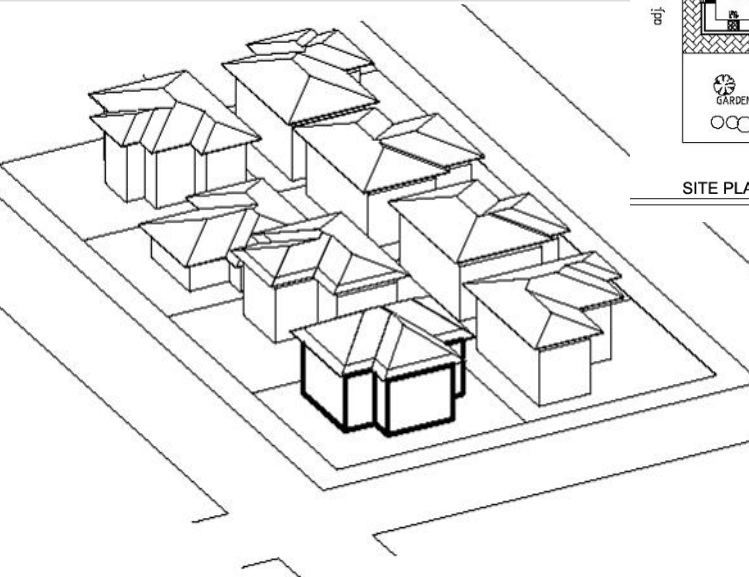


Housing types in Vietnam and their features *(cont.)*

- Urban detached house: a free-standing structure built in a plot with surrounding gardens, boundary fences and a private driveway.

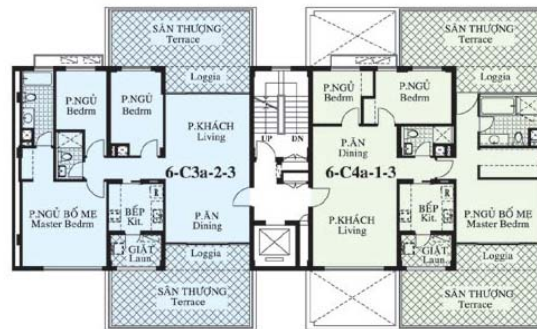


A typical urban detached houses located in An Phu, a new urban area of Ho Chi Minh City. Images from author's site visit in 2009.



Housing types in Vietnam and their features *(cont.)*

- **Apartment:** a type of housing that has more than two floor levels with pathways, staircases, and infrastructure systems used by many families and occupants.

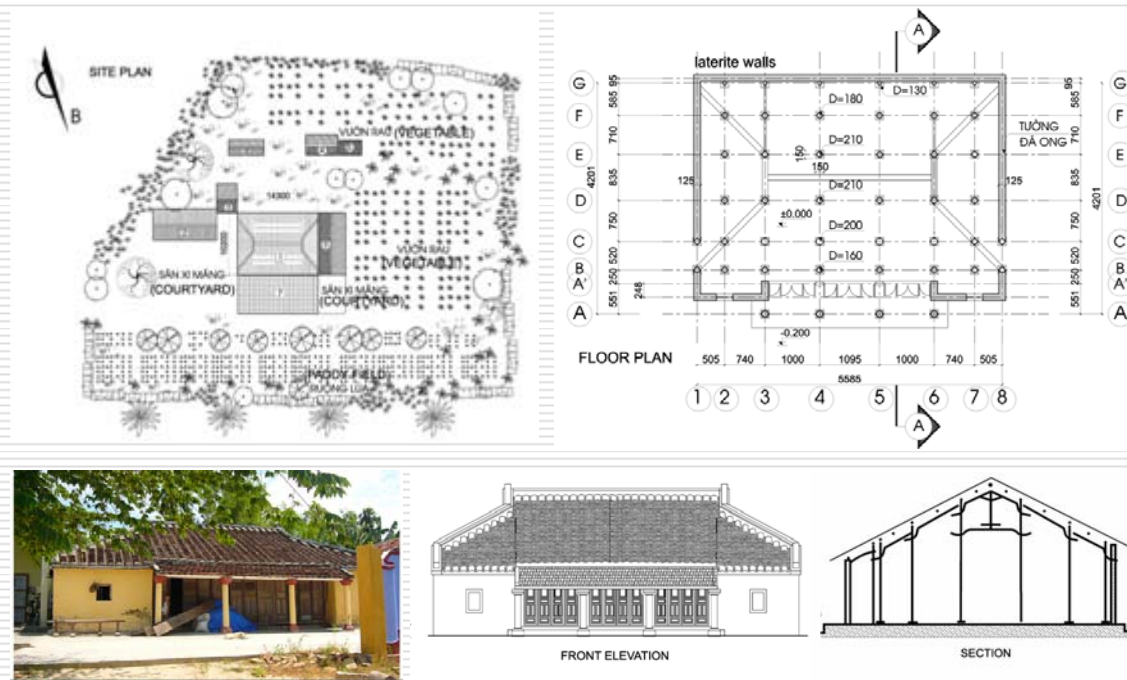


An apartment designed by SURV-Shanghai, China, completed in 2008, in Saigon South Urban Area, Ho Chi Minh City, including 327 units and shops, and 273 parking places. The plot coverage ratio is 30.65%. Source: Phu My Hung, 2005.



Housing types in Vietnam and their features *(cont.)*

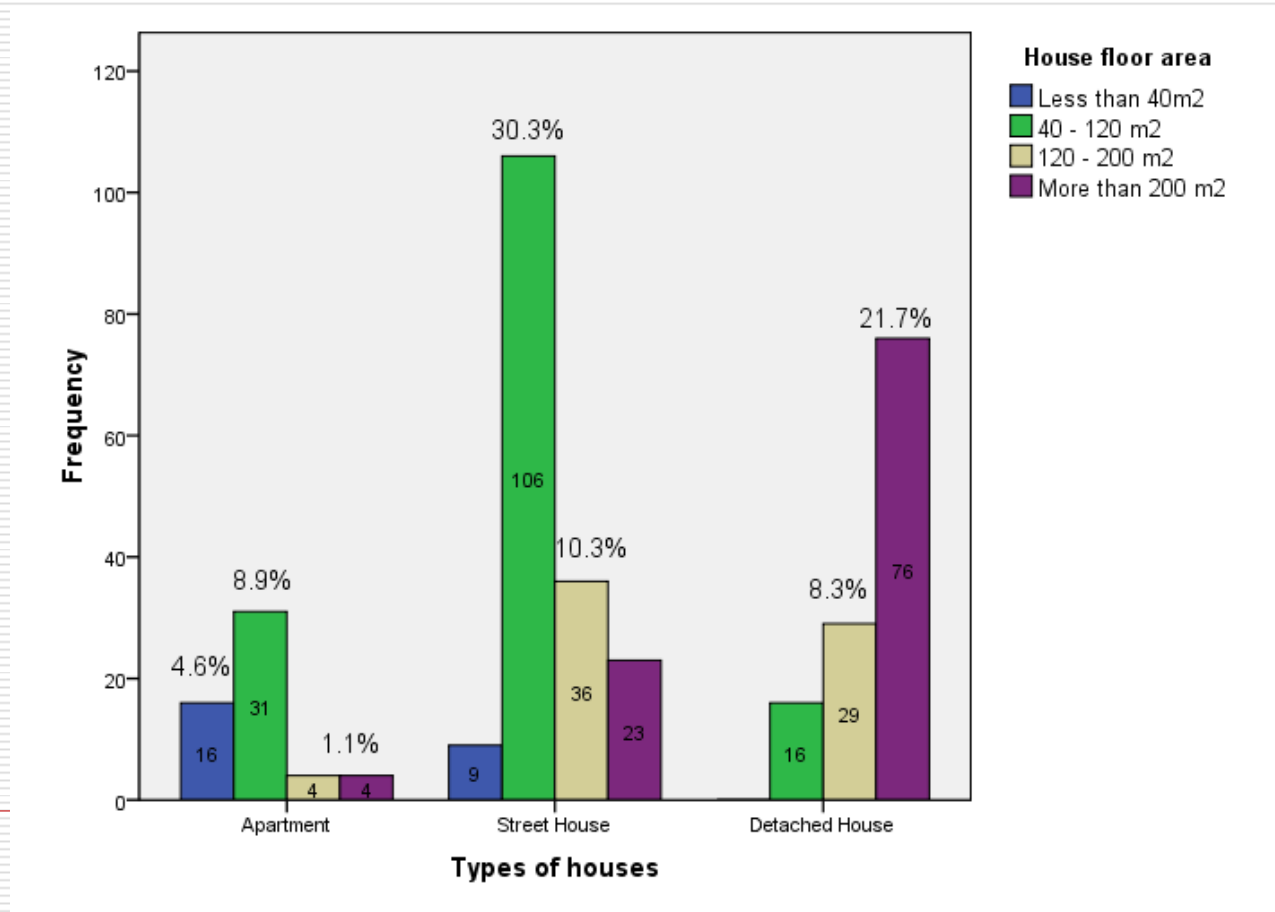
- Rural house: or vernacular house is a type of house, which has much land for a combination with other naturally integral elements such as ponds, yards, and gardens.



Through evolution, this type has been adapting to regional environmental conditions and culture by applying local materials and passive designs of the construction.

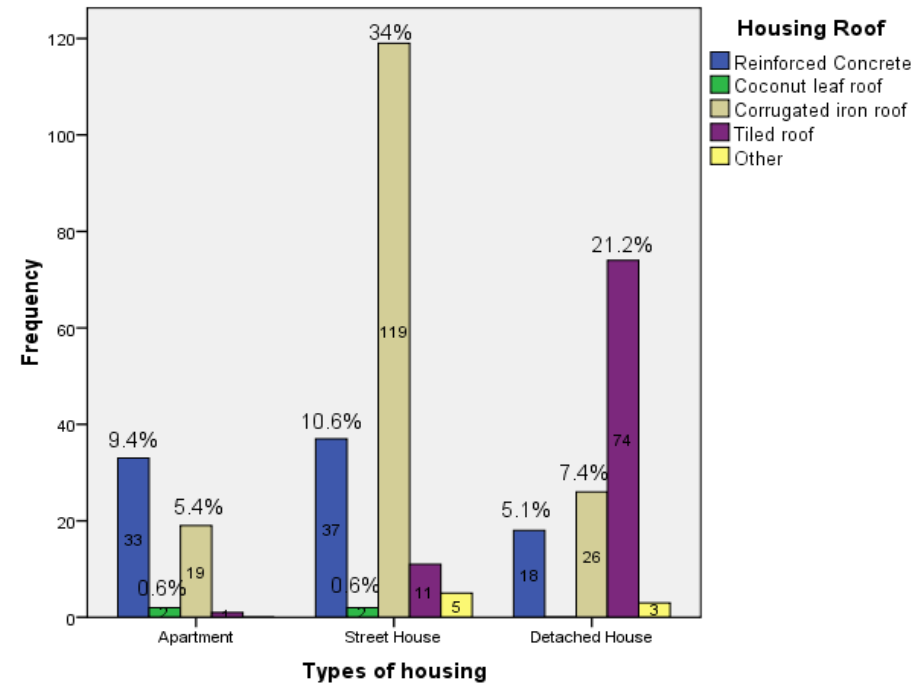
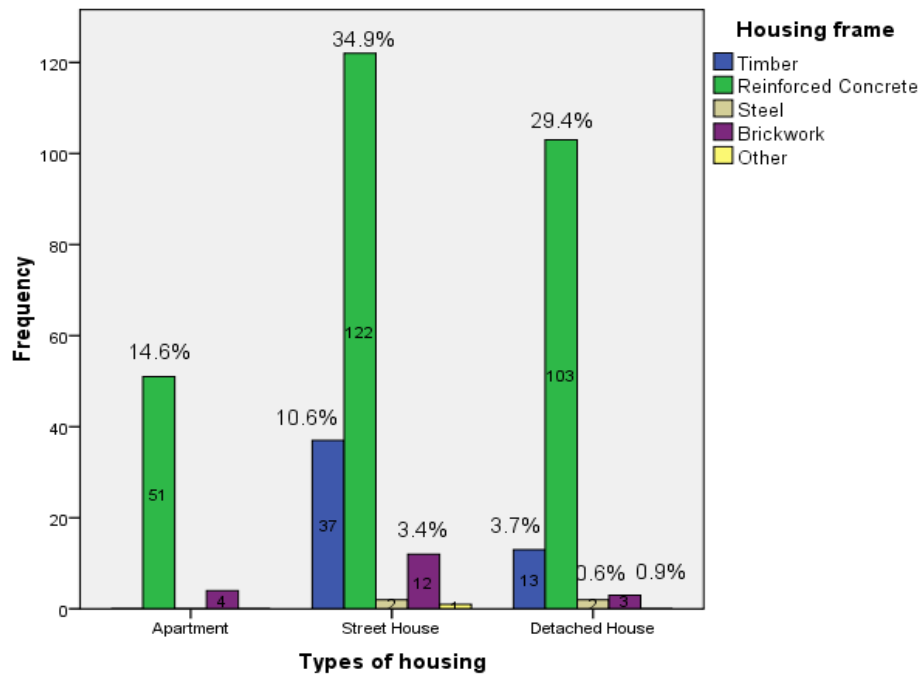
Results of survey

□ Gross floor areas of housing types



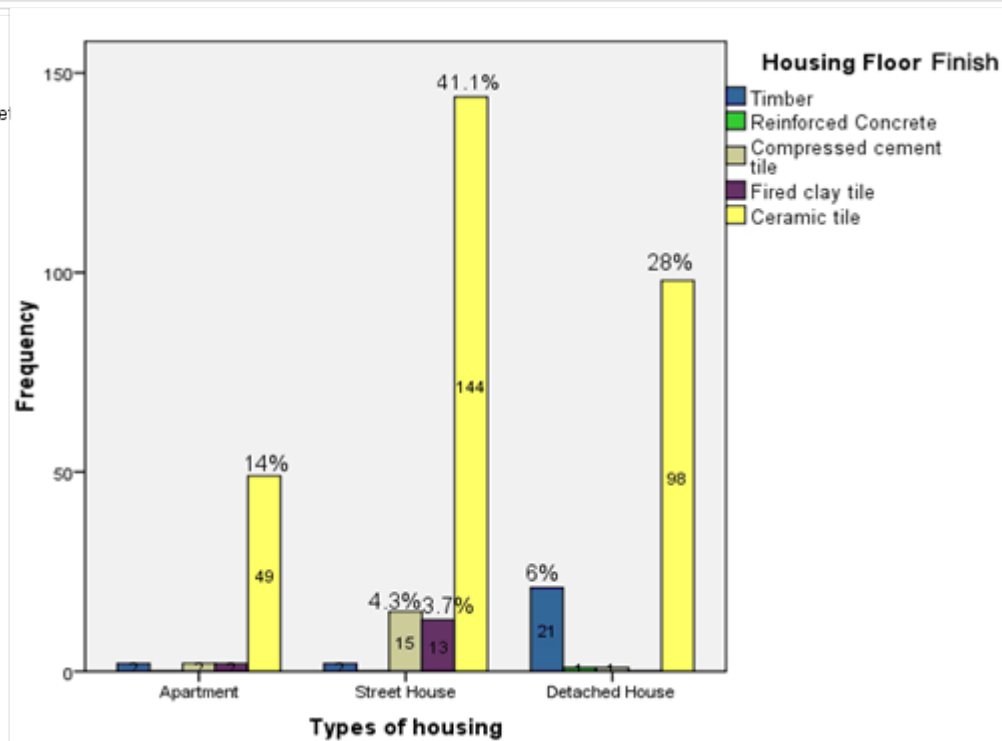
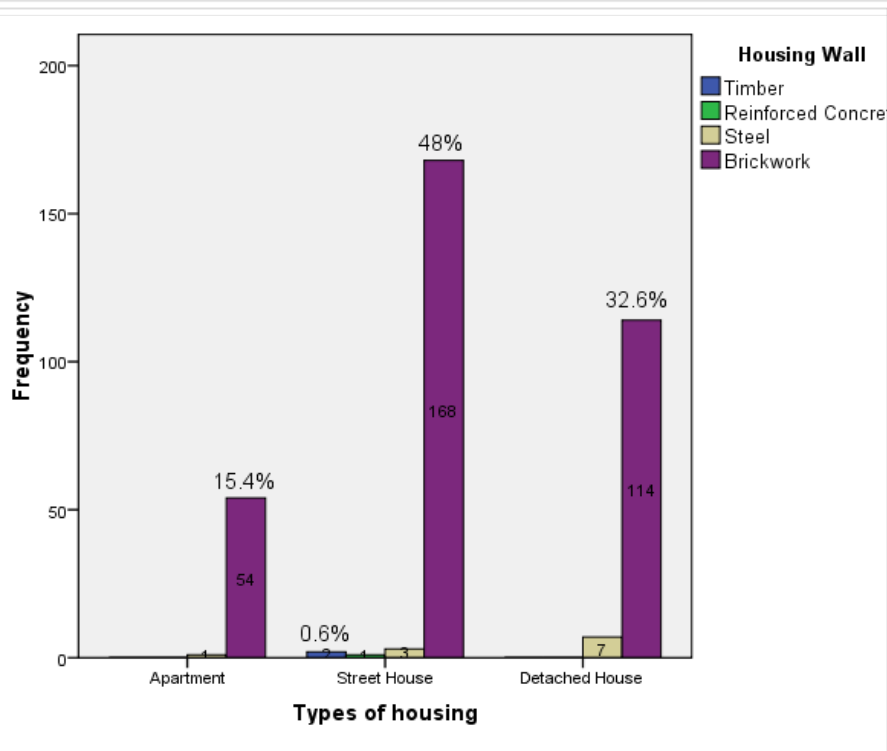
Results of survey (cont.)

□ Material use: embodied energy consumed materials/ products



Results of survey (cont.)

□ Material use: embodied energy consumed materials/ products



Results of survey *(cont.)*

□ Thermal comfort

Comfortable	Hot & stuffy	Cold & draughty	Very hot	Very cold
80.3%	11.7%	6.0%	0.3%	1.7%

Due to - Orientation 68.6%,
 - Operable windows/doors/apertures 60.9%

□ Natural ventilation

Naturally ventilated	Wind received	Not ventilated	No natural wind
54.95%	34.6%	9.1%	1.1%

□ Natural lighting and shading

Windows/doors	Atrium/skylight	Courtyard	No natural lighting
89.7%	49.4%	23.4%	6.6%

Shading means: canopy/ curtains/ blinds/ trees/

Results of survey *(cont.)*

- Water conservation:
 - 94% no rainwater harvesting
 - 93.4% use of network pipe
 - 4.9% use of underground sources
- Energy consideration:
 - 2.6% use of solar hot water
 - 1 house using solar electric panels
 - 97.1% don't know solar power
- Waste avoidance:
 - 85.7% did not sort out waste
- Sense of community:
 - 62% meet friends in living room
 - 16.9% using verandah to meet friends
 - 13.42% meet friends in garden/yard

 - 50% close to public transport (100-800m)
 - 20% close to market
 - 9.1% close to park

Interviews and discussion for guidelines

Evaluation on existing housing system

- Types of urban housing: row house (well-adapted, self-designed)
 - Mixed types of housing were seen as desirable, including low-rise and high rise buildings, to provide a diversity of spaces for changing needs
- Housing forms and characteristics
 - Multi-storied housing forms for high-density populations
 - Mixed-uses in these buildings, such as shops and services on lower floors and apartment units on upper floors
- Impacts of current housing development on the environment
 - Row houses should be maintained in urban areas to respect the existing built fabric as a traditional type of housing
 - The number of detached houses should be minimised to save open spaces in urban areas
 - Encouraging passive design strategies for rural house

Interviews and discussion for guidelines *(cont.)*

Evaluation on existing housing system

- Materials and resources
 - Abundant agricultural by-products in Vietnam manufactured into natural building products for modern construction
 - Robust materials and structures considered due to increasing extreme weather events
 - 'Design for flexibility' applied so that spaces can be varied according to changing occupant requirements and building functions
- Health, comfort and safety
 - Meeting all occupants' requirements, such as the number of floor areas, spatial organisation, ventilation, daylight, noise control, as well as personal habits of living and working
- Urban infrastructure and water services
 - Wetlands and natural drainage systems conserved
 - Tropical vegetation expanded and integrated with urban houses
 - Rainwater collected by integrating rainwater systems into houses

Interviews and discussion for guidelines *(cont.)*

Interviewees' views on existing legislative regulations

- Vietnam building codes and standards **borrowed and translated** from foreign countries
 - Too general** to apply and need to be more detailed
 - Major cities have their **own building regulations** to control and manage housing design and construction
 - There **is not yet enactment** of code and guideline for sustainable housing
 - The guidelines should address: cooling the house by using **passive systems**, using energy with **solar panels**, vegetation with **green roofs and walls**, **waste sorting and composting**, **water treatment** in group of houses
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Conclusion

- ❑ Transition to sustainable housing requiring design principles appropriate to the Vietnamese climate and culture
- ❑ This survey of current housing, and in-depth interviews providing the basis for green design guidelines that suit cultural and consumer preferences
- ❑ The guidelines devised to integrate construction and retrofitting with the climate and culture, health and safety issues, resource minimization, energy reduction, and waste avoidance

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Thank you
