



Possibilities and challenges of sustainable condominium development in Thailand: an analysis through the circle of blame concept

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ABSTRACT

The main objective of this research is to survey the attitudes of project developers, investors, consumers (residents and prospective buyers), and architects involved in the sustainable development of condominium projects. Using the circle of blame concept, qualitative research was conducted by collecting data through structured interviews on sustainability in four areas: environmental, economic, social and community, and aesthetics and functional. Based on the findings, most of the respondents did not renounce the concept of sustainable development if economic sustainability was as expected (such as the project value, rent, return, and cost saving). Thus, it can be concluded economic sustainability is a prerequisite for developing sustainable condominiums. Environmental, social and community, and aesthetics and functional sustainability are the next steps to approach for the project stakeholders. The findings of the research indicate that increased development costs and risks are the key barriers to the success of sustainable development in the Thai condominium market.

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Introduction

Real estate development typically means to construct a building that can last for a long period of time, after considering the society and the environment, as it is attached to an area and cannot be relocated (Appraisal Institute, 2013). Therefore, a long-term analysis of real estate investments in combination with various contexts is important for appropriate sustainable development plans. During the last two decades, the number of condominium developments in Thailand has increased rapidly (AREA, 2018), similar to other big cities such as Addis Ababa, Kyoto, and Toronto (Lehrer, Keil, & Kipfer, 2010; Larsen, 2019; Tang, 2010), which has affected the lifestyles of the Thai population. While developers continue to enjoy profitable growth each year from their businesses, such development has led to numerous problems such as traffic jam, overcrowdedness, air and visual pollution, and climate change. Therefore, a rethinking of sustainability concept in condominium development is important not only for developers but also for all other stakeholders. For this reason, sustainable real estate development is relevant to all parties involved in real estate projects – from investors and developers to architects and users. However, it is notable that

sustainability in real estate development is frequently assumed as only focusing on green buildings for energy or environmental conservation (Ellison & Brown, 2011; Smith & Pitt, 2011; Warren-Myers, 2012; Yiu, 2007). However, the principle of sustainability entails a balance of three key elements: environment, economy, and society.

To deal with all the related problems and to promote sustainable condominium development, this study uses the circle of blame concept defined by Cadman (2000). It refers to a situation wherein all stakeholders blame each other for not achieving the desired level of sustainable buildings. Although this concept of sustainable development is very interesting and evocative, it has not been academically and empirically studied enough in the real situation as well as in relation to Thailand's different attitudes and lifestyles (Andelin, Sarasoja, Ventovuori, & Junnila, 2015). Therefore, this study focuses on the significance and implication of applying the circle of blame concept with the purpose of finding developmental constraints, and study the environmental, economic, aesthetic and functional, and societal aspects of sustainability. In addition, the study aims to suggest sustainable development guidelines that can be beneficial for all the parties as well as for similar countries that have witnessed rapid growth in urbanization.

Sustainable development

The concept of sustainable development has been studied over a long period. In 1987, the World Commission on Environment and Development (WCED) defined sustainable development as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland, 1987). In 2015, all the United Nations (UN) members set the 17 Sustainable Development Goals to build a better world for the people and the planet by 2030 with the aim of promoting prosperity, protecting the environment, and ending poverty with strategies that build economic growth and address a range of social needs including education, health, equality, and job opportunities, while tackling climate change (United Nations, 2015). The UN-Habitat established connections to the 2030 Agenda in the area of urbanization and city development. Thus, it is apparent that sustainable development has been studied across various venues and has covered a variety of aspects, from macro to micro views, such as humanities, culture, tourism, service, and construction sectors (UN-Habitat, 2016). However, this research focuses on the micro level of sustainable development in real estate projects.

Most studies on sustainable development focus either on the importance of being environment-friendly or green building (Ellison & Brown, 2011; Smith & Pitt, 2011; Warren-Myers, 2012; Yiu, 2007). In fact, real estate development is not completely sustainable only due to environmental awareness – it needs to be in equilibrium with the economy and society. Therefore, it is important to consider all aspects of sustainable development related to economy, environment, ethics, and society (Elkington, 1998; Isaksson & Garvare, 2003). For example, before creating a hotel in a natural forest, a developer was shown a sustainable development company's mission to simulate the living in the surrounding area, making the developer fully understand the context before commencing the hotel development (Brandon, 2012). Furthermore, Akadiri and Olomolaiye (2012) derived a project's sustainability drivers by receiving information from architects and designers that comprised aesthetics, maintainability, energy saving,

resource efficiency, waste minimization, life-cycle cost, social benefit, and performance capability. In addition, there are various studies that use secondary-data for measuring the value and financial returns of sustainable real estate. These studies prove that the developers of sustainable real estate made surplus benefit (Kafafi & Liddle, 2010). Some studies have also covered attitudes among users, consumers, and developers or owners to survey perspectives and concerns about sustainable development (Warren, 2010; Watering & Wyatt, 2011). From the above reviews, it can be concluded that the common concept underlying sustainable development is the triple bottom line or the Triple P model – people, planet, and profit – which conforms to the larger concept of sustainable development defined by the WCED and UN. Further, following Falkenbach, Lindholm, and Schleich (2010), different drivers of sustainability can be illustrated, composed of property, corporate, and external drivers.

In fact, real estate development is not only a physical concern but also a psychological one as it affects the quality and joy of users and the nearby community (Lai, Chau, Ho, Wing, & Lorne, 2005). Thus, it is imperative that the core concept of sustainable development includes economic, social, and environmental elements in the context of real estate. In addition, it should also include aesthetics and functional elements (Akadiri & Olomolaiye, 2012), as a construction project is long-lasting and can inspire the surrounding community or discourage it if the design is inconsistent with the community's desires.

Economic profitability

Sustainable development is greatly affected by economic conditions. Sustainably developed real estate projects contribute revenues to the local community and tax authorities, and thus, are critical to the public and surrounding communities as well as the larger economy and society (Jones, Comfort, Hillier, & Eastwood, 2005). Unlike land, building is considered as a depreciating asset in accounting. Thus, the construction based on the concept of sustainability would present less physical deterioration than ordinary buildings, and would also preserve the environmental conditions (Yiu, 2007). Even though the initial costs and activity of sustainable project investments are usually higher and more complicated than those of buildings in general, the cost of long-term maintenance is lower and is recognized by the society and the surrounding community. Therefore, sustainable development not only reduces business risk but also increases social, marketing, and legal opportunities (Lorenz & Lutzkendorf, 2008; Pitt, Tucker, Riley, & Longden, 2008; UNEP, 2009). In conclusion, sustainable real estate development must be able to maintain financial returns for project developers (Cajias & Piazzolo, 2013; Fuerst, Mcallister, Wetering, & Wyatt, 2011; Kimmet, 2009; Low, Gao, & Teo, 2016), either through higher value or lower cost.

Environmental responsibility

Real estate development has resulted in a significant global environmental impact, reportedly accounting for 40 percent of greenhouse gas emission, 16 percent of water usage, 30 percent of trash, 40 percent of natural resource consumption, and 71 percent of power consumption. In the next 15 years, real estate development in Asia is

estimated to create an environmental impact on 50 percent of the new buildings in the world (Newell, 2009). Therefore, being environmentally conscious plays an important role in a variety of ways. For instance, Akadiri and Olomolaiye (2012), Jones et al. (2005), and Pitt et al. (2008) have shown that many sustainable development projects acknowledge the importance of the environment based on their energy, water, and raw material conservation, waste reduction, and recycling. Many studies on sustainability are similar; however, the methods of assessing sustainability vary, such as policy, attitudes, or waste measurement from each building. Additionally, sustainable environmental development also means emphasizing the internal building environment pertaining to noise and air quality, workplace quality, and healthy employees (Pitt et al., 2008; Smith & Pitt, 2011).

Social awareness

The concept of sustainable development goes beyond environmental significance and includes social concerns, such as the development of continuing education, crime rate reduction, supporting charity, and fostering self-confidence (Akadiri & Olomolaiye, 2012; Jones et al., 2005), as well as building design, which can positively contribute to the health of the building's inhabitants (Pitt et al., 2008). In addition, any new development must not cause an adverse impact on the circumstances of the existing inhabitants such as change in the original access pattern, and must be accepted by them (Lorenz & Lutzkendorf, 2008; Pitt et al., 2008; Ugwu & Haupt, 2007). On the other hand, a new building project might encourage engagement with both the building and the surrounding communities (Ellison & Brown, 2011).

Aesthetic and functional design

Most sustainable development projects place significant emphasis on physical issues concerning health, economy, and community. Another key facet that is related to emotions and feelings is the aesthetics and functions of building design, which can affect the community either favorably or adversely. A world-famous architecture, such as the Sydney Opera House in Australia, Petronas Twin Towers in Malaysia, or Bilbao Guggenheim Museum in Spain, can change the expression of a city and create massive revenues for the community. Therefore, a proper design must consider the surroundings, history, and culture of the country, which is one of the city development requirements of the Western Australian Neighborhoods Design Code (Curtis & Punter, 2004). A sustainable design generates direct and indirect long-term returns to the owner of the project and enhances the reputation of the designers. Furthermore, easy maintenance of an income-generating property must be ensured as it needs a long time to recoup return (Akadiri & Olomolaiye, 2012). The importance of design sustainability does not solely rely on the building's exterior; it must also concentrate on quality interior design, such as the availability of green area, sufficiency of natural light, and proper private work area, all of which affect employees' work quality (Smith & Pitt, 2011). In addition, the idea of universal design has emerged as an important facet (Talukhaba, Ngowi, & Leulaep, 2005) as it reflects the customer-centric view of the developer.

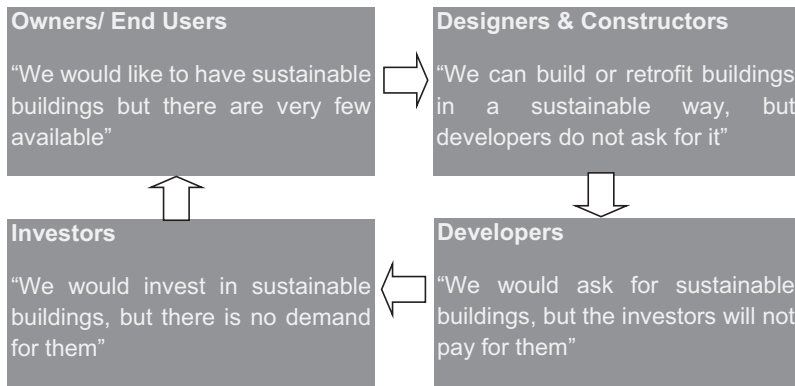


Figure 1. Circle of blame (Cadman, 2000).

While project developers and users are the key players in sustainable real estate development (Warren-Myers, 2009), architects are particularly important because they are responsible for the layout and selection of the construction materials or techniques (Pitt et al., 2008) affecting the economy, environment, and aesthetic function.

Cadman (2000) describes the obstacles that hinder sustainable property development as the circle of blame, that is, the rejection of responsibilities by each party involved in sustainable development. Figure 1 depicts the circle of blame concept wherein the users want a sustainable development building, but blame that there are not many such buildings available. The architects and contractors contend that they would want to create a sustainable development project; however, the developers do not commission them. The developers claim that they want to build sustainable development projects but investors refuse to support. Lastly, investors maintain that they want to invest, but there is not enough demand from customers. It is interesting to consider the circle of blame concept, and its mechanism in the development of condominiums in Thailand.

In summary, this study focuses on four elements of sustainable development adapted from the literature review (Figure 1 and Table 1). In general, a sustainable real estate development approach is usually an overview of the environment or nature conservation. However, the main principle of the sustainable development concept is to strike a balance between the economy, environment, and society (Warren-Myers, 2012), although aesthetic and functional design is also important. Therefore, the conceptual framework of this research applies all related principles of sustainability to the sustainable condominium project.

Research methodology

This is a qualitative study of information collected through meetings and in-depth structural telephonic interviews. The questionnaires are adapted from the literature review shown in Tables 1 and A1 (see appendix). Two experts from residential development companies were asked to review the questionnaire's validity. The interview was applied through a pre-test with a sample group of five participants, similar to the target group. Sample attitudes were gathered similar to Cadman (2000) on the concept of the circle of blame by well-trained



Table 1. Sustainability metrics in real estate development.

Sustainable Development	Sustainability		
	Economy	Environment	Social
Economic, environmental, social, and aesthetic and functional development that meets the current requirements without interfering and maintaining the future development capability. (adapted from WCED, Brundtland, 1987)	<ul style="list-style-type: none"> - Consumer force - Financial force - Unwanted and unaware of consumers (Zainul Abidin, Yusof & Othman, 2013; Falkenbach et al., 2010; Gandhi, Selladurai, & Santhi, 2006; Pitt et al., 2008) - Cost of Maintenance - Long- term energy savings - Image (Lutzkendorf, 2011) - Customer/ user satisfaction (Lutzkendorf, 2011) - High occupancy rate (Lutzkendorf, 2011) 	<ul style="list-style-type: none"> - Energy consumption - Use of water resources - Reuse - Recycle - Noise and air disturbance (Pitt et al., 2008) (Akadiri & Olomolaiye, 2012; Jones et al., 2005) -The quality of interior design, such as having a green area inside, adequate and appropriate artificial and natural light, and appropriate ambience – which affects the quality of employees' work – of private working area (Smith & Pitt, 2011) - A standard in environmental conservation. 	<ul style="list-style-type: none"> - Community force - Regulatory force (Gandhi et al., 2006) - Cooperation with the community to minimize crime rates, and support activities of various charitable community projects to win the trust and confidence of the community (Akadiri & Olomolaiye, 2012; Jones et al., 2005) & Brown, 2011) - Community engagement (Ellison & Brown, 2011) - Helping the existing community understand about the change of area and environment (Lorenz & Lutzkendorf, 2008; Pitt et al., 2008) - Accessibility without causing adverse impacts (Ugwu & Haupt, 2007) - The acceptance of the society (Lorenz & Lutzkendorf, 2008; Pitt et al., 2008)
			<ul style="list-style-type: none"> - Aesthetics and maintainability (Akadiri & Olomolaiye, 2012) - Universal Design (Talukhaba et al., 2005) - For city development, good design considers the environment, community surrounding, history, and culture of the area (The Western Australian Neighborhoods Design Code; Curtis & Punter, 2004)

research assistants with real estate business and architectural backgrounds. Judgmental sampling was applied with the relevant samples, composed of five real estate developers, five architects, and five investors; the sample groups were either at the management level or were the owners of a business for at least five years. Five residents and five prospective condominium buyers were also a part of the sample; residents were condominium co-owners for a minimum of three years, and buyers were those who were considering a condominium purchase within a period of one year. The sample group was selected from different organizations and residence projects. Although 25 samples are sufficient for qualitative research, five samples of each group might be considered as a limitation of the study.

Research results

This research summarizes the information received from the interview with each group, as well as comparative results of the groups according to the described circle of blame as shown in [Table A1](#) in Appendix.

Architects' interview: general information

This sample group had a total of five male architects from various Thai companies. This sample group partially agreed that: "We can build or retrofit buildings in a sustainable way, but developers do not ask for it," as project developers do not specify the sustainable building concept as part of the design; this does not mean that developers do not need to create sustainable condominiums, but it is actually a matter of cost and risk concern.

Architects' perspective: economic profitability

The architect group had a common attitude toward the importance of sustainable development. Each architect was eager to make sustainable-concept designs, even if they entailed greater difficulty and complexity, as they sought long-term benefits.

Architects had contrasting perspectives on the short-term benefits of sustainable development, deduced from their response to whether or not sustainable development can create a good image for customers. Some architects had a negative attitude toward the short-term benefit due to the lack of real social responsibility, although some architects agreed that their sustainable condominium design was satisfying for the residents and worth a long-term investment. On the other hand, it was surprising that half of the architects did not agree that the sustainable condominium design provided better value or sales capability compared to the general building. It was shown that the architects' long-term view was focused on the importance of value-for-money management within the aspect of building maintenance rather than a higher resale price.

Architects' perspective: environmental responsibility

The architect group's perspective toward environmental responsibility showed an elevated level of awareness on the design of energy-saving buildings and the concept of renewable energy.

Architects were in agreement that they could not suitably address the environmental concerns in their designs because project developers guided the direction of the development toward the most useful in terms of marketing or legal perspective. There was some agreement on the importance of choosing environment-friendly materials; however, this selection was also made by the project developer.

To focus on the sustainability concept is dependent on the price and developers.

(Architect 2, Male)

No matter how much attention we pay to green building design, it will be finally discarded if the developers cannot make satisfactory returns.

(Architect 5, Male)

Architects had different opinions about the standard code of building design for energy and environmental conservations. The disagreement groups did not care about the standards as they claimed they already work according to the legal requirements, such as preparation of reports on environmental impact assessment, while the only one in agreement expected a truly sustainable project and emphasized that buyers and developers have to be the driving forces.

Architects' perspective: social awareness

The architect community has been awakened by social and community sustainability, especially in new buildings. One architect provided an interesting perspective that the development of a new project always affected the environment of the existing community, whether positively or negatively. For example, when a new community emerged, it was the existing community that had to adapt, as in the case when a condominium project was developed in the On Nut district. Thus, the emergence of a new generation of communities made an existing area better-developed: more jobs were available in the new community and building renovations beautified the district.

For the design to engage with the existing community, the dissenting group ideas were given importance or attention only to the extent required by the legal framework, while other ideas showed that designing the area should consider more than the legal aspect, such as a design with a space-efficient drop-off area that does not affect an existing community road. For the idea of linking external and internal communities, an opinion showed that it was unimportant due to Thais' lifestyle, and therefore not considered as crucial. On the other hand, it would be better to focus on the internal community of the project through development of a more quality public area to compensate for the smaller space of each unit.

The architects opined that although creating an understanding within the existing community was useful, it was not in the scope of their duties. Moreover, the architects' past projects did not show any issues with the existing community. One architect raised the point that project development needs to be a shared understanding between new and existing communities, which the developers should take into account. For example, a developer of a small project made the front road wider, which earned appreciation from the existing community. Therefore, this case was an illustration of the new and

existing communities living cordially together. Conversely, it can be easy to have problems if the developers do not care about the existing community.

Architects' perspective: aesthetic and functional design

All architects agreed that building aesthetics should be considered in the design process. Most architects commented that aesthetics was always a priority, although practicality cannot be overlooked. For example, the given project was aesthetically designed but it was later found that aesthetics had caused usage problems. Therefore, in any project, it is important to not focus exclusively on aesthetics. In addition, there were architects who did and did not pay attention to the universal design.

To make the design compatible with the surrounding environment and the history of the area, most architects commented that the basic principle of design requires contextual study in each area and respect for the original environment. However, the architects asserted that even after the analysis of the environment, the developer's marketing goals eventually frame the form of the building. Some architects did not pay much attention to the project surroundings; however, if it was a cultural area or had a meaningful history, the information would be embedded in the design.

To make design compatible with the surrounding environment and the history is dependent on each project suitability. Especially for the project that is close to a significant area, making relevant architectural themes would benefit greatly.

(Architect 4, Male)

It depends on the project context. If we find any context that can create value to the project design and can be a selling point, we will do it.

(Architect 5, Male)

The architect group agreed on the importance of sustainable development; however, the project developers or owners' design guidelines imply that the possibility for architects to independently define the sustainability concept into their design is rather low. In addition, it is found that architects emphasize energy savings, and usually do not consider other sustainability aspects such as economy, society, and community. As a result, the architect may not have a direct role in determining the sustainability of project development, and neither do most developers ask for it.

Project developers' interview: general information

The sample comprised five developers – three males and two females – who are active in a real estate project development. They partially agreed by saying, “We would ask for sustainable buildings, but the investors will not pay for them.” In the past, investors disagreed on supporting sustainable project development because it was not in the buyers' interest as it increased the cost of development. However, currently, most developers believe that the approval of money by the investors depends on the potential of each project. Since sustainability is better known as a concept now than in the past, the developers apply the sustainability concept and agree to support the development in response to market needs.

It is true that higher investment cost of sustainable development will increase the unit price. Therefore, banks do not want to take higher risk for sustainable development projects.

(Developer 4, Male)

It is not true. If a developer can make a good project, investor would be interested in investing in the project.)

(Developer 5, Male)

Project developers' perspective: economic profitability

Most developers agreed that economic composition was a vital factor in the consideration of any development project. However, the interview revealed that the group is not aware of the importance of sustainability in terms of value increase because the value of the building was evaluated by locations and functions. The developers showed two distinct traits on their willingness to undertake complex work or investment for sustainable building – good for saving long-term energy or not worthy due to higher investment costs.

Willing to invest more in order to solve the future problems.

(Developer 1, Female)

Not interested in the concept of sustainability, as no confidence whether it will be worth the investment.

(Developer 3, Male)

Most of the developers agreed that the sustainable condominium development concept offers a short-term benefit by generating marketing interests and long-term benefits of better competitiveness and higher satisfaction for customers as compared to other general buildings located in the same area. It was noticeable that from the overall perspective, developing a sustainable condominium project was viewed as having the capability of earning surplus benefits. However, there was difference of opinions and conflicts on whether sustainability really builds value for investment.

Project developers' perspective: environmental responsibility

Most developers maintained that environmental responsibility was the key to developing a sustainable project, and therefore, the surrounding environment or saving of energy must not be disregarded. The developers agreed that the investment was based on energy conservation to generate economic returns. One developer explained that some projects were advertised as conserving energy. However, the project sales were not successful; thus, it could be assumed that sustainable development based only on energy conservation might not be attractive enough to the customer.

Moreover, it was found that there was a concern over eco-friendly materials only if using them yielded less than usual profit. Regarding environmental standards or certifications, most developers described that some standards were higher than

needed, which unnecessarily increased expenses. Thus, there was no interest in working for the certifications.

Very interesting if it is a green concept but energy saving, it has to be proved.

(Developer 4, Male)

Very interesting but the higher price of developing sustainable building has to be worth the money.

(Developer 5, Male)

Project developers' perspective: social awareness

Most project developers placed importance on society and surrounding communities, as they contributed to maintaining a good relationship between the existing and new communities and the long-term reputation of a developer, while certain developers only placed importance on legal guidelines. As regards the development of areas to ensure that the traffic outside the building is not affected, some developers considered the existing community during the design phase, where it might be necessary to allocate project areas as public areas with the aim of reducing the problem of community traffic jam. The information received from the project developers showed that there was no joint activity between the communities inside and outside the project, a situation that was not aligned to the Thai culture and posed security risks. Not having a problem with the surrounding community sufficed.

In addition, almost every project developer had a consistent opinion on the importance of understanding the surrounding communities. All the actions of the consulting representatives followed the legal framework with the objective of understanding the community area. Further, developers explained that when a new project was developed, it was also beneficial to the existing community as the revenue was distributed to them.

Project developers' perspective: aesthetic and functional design

All project developers provided consistent feedback: the aesthetics of a project was important to impress the customer at first sight – if the project did not have an appealing design, it would not attract customers. On the other hand, functionality was emphasized, as the project should meet the needs of the customers and should be easy to maintain over the long term. Nearly all the developers were unaware that the project design has to be in accordance with the surrounding context, as they prioritized customer satisfaction and placed more emphasis on designing iconic projects. The only consideration with respect to designing with the existing environment was that the development area must be located in a special area that was unique enough to have a saleable story. In addition, all developers were developing the project to allow people equal access: Universal design was described only by one developer as a priority; however, if the investment was too high, the concept would be shelved. It was evident that most developers placed importance on the aesthetics and functions, which were considered to create value, and had the ability to sell as well as reduce the cost of the project.

Not necessary to be compatible with the site context as I want my condominium to be an icon in town.

(Developer 1, Female)

If compatibility with the site context leads to higher sales volume, I will do it.

(Developer 4, Male)

It is found that project developers do not oppose sustainable condominium development if the development is able to meet their financial goals. For example, if it considers the environmental aspect, it must not result in a higher cost, and even if it does, the target market must be able to accept it. To create social sustainability, the developers plan it as a key marketing objective to build a long-term reputation for the company's brand; for the project's building design, it must also be able to meet economic needs. In summary, the project developer is willing to develop the project according to the sustainability concept, provided it makes an economic return in the short or long term. In addition, in the past, developers assumed that the investors do not support sustainable projects when the cost is higher than usual. However, developers now believe that the viewpoint of investors may have changed by supporting sustainable development only if the project can integrate sustainability concept into its marketing competence.

Investors' perspective: general information

The investors' group included two males and three females who work in the real estate investment business in a bank, Real Estate Investment Trust, and valuation company. The sample opinions differed: "We would invest in sustainable buildings, but there is no demand for them." The first group agreed that the investment in sustainability was not the priority, especially when compared with returns. While the other groups assumed there was a target market that was interested in sustainable development; however, the project developers did not develop a truly sustainable project and were not able to promote the recognition and benefits of sustainable development to the customers.

In terms of marketing, the concept of sustainable development just boomed for 10–20 years. However, the initial priority is still on financial feasibility and location quality rather than green design.

(Investor 2, Female)

Investors' perspective: economic profitability

All the investors focused on prioritizing the return on investment. From the perspective of the approval of credit for a sustainable project, investors opined that the project must be proven to have investment potential as well as customer interest and must comply with normal investment standards. Most of the investors indicated that additional investments in sustainability generate short and long terms results, such as saving the management of juristic person expenses and building the project developers' brands and

images. However, in contrast with the developers, this might not be too attractive for the investors as they only require a project to sell quickly.

The investors were of the same opinion that the importance of sustainability must coincide with the price of projects. For example, the mid-price condominium group placed high importance on tangible factors, such as saving on the electricity and water supply bill, while the high-price condominium group placed significant importance on intangible factors, such as saving natural resources and reducing global warming. However, most investors indicated that it might not be the right time for sustainable building demand, as the Thai customers' top priorities were location and price.

I will pay more attention to the concept of sustainability if the project value increases in the future.

(Investor 4, Female)

I pay attention to sustainable development as it can be a good selling point.

(Investor 5, Male)

Investors' perspective: environmental responsibility

Most investors focus on environmental responsibility in terms of energy saving resulting from the reduced cost of water and electricity, and in terms of increasing the market value of the project. As regards environment conservation in the project, most investors had a consistent opinion of disinterest in the selection of environment-friendly materials and achieving environmental standards certification. Only conforming to legal requirements was satisfied. Building environmentally sustainable buildings was undertaken only if the purpose was increasing the market values of the project.

Investors' perspective: social awareness

In the aspect of social and community awareness, all investors had the same opinion that it was unimportant – following the framework of a legal approach was sufficient and the details of social and community sustainability were not a decisive factor for any investment. Similarly, some sustainability projects were supported, but they failed to create satisfactory returns. Thus, it is obvious that social and community sustainability were not influential factors for investors.

No attention towards surrounding community, as long as they do not protest; only working to conform to legal requirements is sufficient.

(Investors 4 and 5, Female and Male)

Investors' perspectives: aesthetic and functional design

The investors' opinion was that the aesthetics of the project design was the key determinant of sales capability, and can be varied by the positioning of the project. In terms of function, the investors' group was divided into two parts: one considered proper design important to customers' satisfaction, which would engender sales, while the other

indicated that the project functions were less important than its completion when the investors' responsibilities were over.

Aesthetics of a condominium is very important as it can yield higher value.

(Investors 3 and 4, Male and Female)

It is found that the group of investors claims that they encourage sustainable development, while they seem to be focused only on economic returns. However, the investors do not have an objection to sustainability; when the developers desire to create sustainable condominium projects, they must be able to provide a major point of sales as well. For example, whatever the aesthetics and functions of the building are, they must be able to attract consumers and make economic returns in the main point-of-sale of the development project for investors. In addition, the investors believe that there are certain consumers who need a sustainable development building; however, the development of the project must be a truly sustainable project and must be recognized by a consumer. Regarding energy-saving buildings, the group of investors is disinterested, as it only wants the project to be sold at the earliest. In the field of social or environmental sustainability, the investors want to comply only with the government regulations. In summary, the investors do not pay strong attention to sustainable building development; however, sustainable development can be supported when it is a key selling point in the project.

Residents and prospective buyers: general information

Residents and prospective buyers included 10 males and females in the same proportion, either single or married, who lived or were interested in buying a condominium in different locations such as Rama IX, Sukhumvit, Udomsuk, and Rachada. The sample responses were similar: "We would like to have sustainable buildings but there are very few available." That is, they were interested in a sustainable building in the market while currently, there were no real sustainable condominiums, or there was no truly sustainable building. In addition, a participant indicated some projects seem to have the desired products, but the price was too high.

Residents and prospective buyers' perspectives: economic profitability

This group had similar opinions on economic aspects. A sample placed importance on the potential to grow economically, but the other group did not pay attention to the value of the increase or rental capacity but focused on the suitability of living.

Willing to invest more, if it is worth the investment.

(Resident 1, Male)

Not agree much with the idea of sustainable development as the project value is dependent on location.

(Resident 5, Female)

Therefore, residents and buyers had a wide range of opinions on the short- and long-term benefits of sustainable buildings. Some opinions were that a sustainable building would

create a short-term market image, while non-sustainable buildings had no long-term benefits. In some opinions, sustainability was not the major purchasing factor and both sample groups agreed that if buildings were truly sustainable, they would produce long-term benefits, especially regarding cost savings.

Sample groups had similar opinions towards sustainable buildings affecting sales and customers' desires. However, this would depend on each customer group and the price level of the competitor. On the other hand, some comments showed that the building's ability to sell, rent, or satisfy the residents was not due to sustainable development, but other factors such as location, price, and facilities.

Residents and prospective buyers' perspectives: environmental responsibility

Most residents and buyers were not aware of the environmental aspect of sustainable building. In fact, the group placed importance on saving energy rather than natural conservation; they also indicated that the price of an environment-friendly building must not be higher than a normal condominium, and placed importance on designing a building that allowed residents to save on long-term costs. For the question that the sustainable condominium must not cause trouble to the surrounding environment, most sample groups did not consider the reasons illustrated, that if the location and price were reasonable, it was good enough to purchase. For the selection of environment-friendly materials, a majority in the sample group was not concerned, while a minority who supported environmental conservation opined that they would select materials that contribute to their health benefit. Moreover, almost all the samples claimed that the official certification standards for environmental conservation were not among their buying motives.

Do not care about environmental sustainability but focus more on building functions.
(Potential buyer 2, Male)

Do not care about environmental responsibility. If the project location and price are attractive, it is sufficient.

(Resident 3, Male)

Residents and prospective buyers' perspective: social awareness

All prospective buyers and residents focused on living in internal and external communities that are peaceful, safe, and secure, as they were critical living factors. Some of them accorded importance to the environmental impact assessment as only required by law; in fact, half of the sample were not concerned with the impact on the external community, as they observed that it was the responsibility of project developers and it was common for the larger community to experience some impact. Half of the sample were interested in enhancing the activity between residents in the project with an external community while half of the sample were not.

Around half of the sample group understood that it should be the responsibility of government authorities and the developer to create understanding between the development project and the surrounding community to avoid long-term problems, while the

other half did not care at all. In addition, all sample groups believed that their current condominiums were likely to be recognized by the existing community.

Residents and prospective buyers' perspective: aesthetic and functional design

The sample group agreed that aesthetics is a key element of the project and an essential element in a purchase decision. Easy maintenance was indicated as a very important function, and that the building should be long-lasting with a low-maintenance cost. The majority of the samples disagreed that the aesthetics must be compatible with the surrounding environment and opined that only the appearance of the building needed to be beautiful. In contrast, the rest of the sample group thought that a beautiful appearance should not disturb or differ from its surrounding context. Ultimately, none of the sample groups focused on the building design to be beautiful and compatible with the history of the area.

To be compatible with the site context or not is not important. It is just a kind of Integrated Marketing Communication (IMC).

(Potential Buyer 5, Male)

No interest in compatibility with the context as my condominium also does not conform to the context.

(Resident 3, Male)

Almost all the samples agreed that universal design was important while there were some sample groups that placed more importance on other aspects of sustainable development.

It is partially true that consumers (residents or prospective buyers) have a preliminary interest in the development of condominiums with long-term energy savings and reduced cost of maintenance. However, it is noted that consumers are susceptible to the price and reliability of sustainable condominium development. This shows cost barrier as the main factor in a purchase decision. In addition, the consumers showed low interest regarding sustainability aspects without long-term savings, such as consistent design aligned with the community, the long-term value of the condominium, and the conservation of the environment. Consumers who prioritize non-sustainable development still focus on the selection of the condominium based on the price and location factors. Therefore, it can be said that the market demand is limited due to several conditions that inhibit the attractiveness of sustainable development to customers.

Summary and discussion

There are four important findings from this research: Firstly, a variety of sample interviews reveal that any aspect of sustainability is related to and commences from economic sustainability; for example, environmental sustainability is necessary for environmental conservation aimed at saving on long-term costs, and when concern over social sustainability is to avoid a complaint of poor social image, which, in turn, affects long-term

economic sustainability (Zainul Abidin, Yusof, & Othman, 2013; Andelin et al., 2015; Falkenbach et al., 2010; Pitt et al., 2008).

Secondly, there is no convincing evidence that investment in sustainable development projects will yield interesting economic value, as it is still significantly based on location and building design. Thirdly, some groups are likely to accept a sustainable development project based only on economic potential. Therefore, it can be concluded that economic sustainability should be a prior concern. Lastly, society, community, and environmental sustainability are not heavily considered by certain groups who only follow legal standards and requirements.

Finally, it can be concluded that the Thai condominium market (suppliers and consumers) is currently not ready to absorb increased cost and risk regarding the concept of sustainable development. Unless it can be worked out or ensured that the concept of sustainable development: 1) does not add extra cost to consumers leading to buying higher unit price than a normal condominium project or to prove that the building operating/energy cost saving has higher performance in the long run; and 2) increases returns and reduces investment risk to developers and investors, assuring that sustainable development is not riskier or yields lower than normal development project. All these are the main underlying reasons of each party in the circle of blame. As a result, further study in each group to identify their roles would be beneficial to promote the concept of sustainability suitably. Besides the responsibility of the private sector, the public sector should address policies to support the development of condominium projects of the private sector based on the understanding of these concerned issues.

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Appendix

Questions and conclusion of the interview

Table A1. Conclusion of the interview.

Sustainability Aspects	Sample Groups (5 persons of each group)				
	Architect	Developer	Investor	Resident	Potential Buyer
The Circle of Blame Concept					
We can build sustainable buildings, but condominium developers have never demanded it.	• • - - p				
We want to have a sustainable condominium development, but investors will not pay.		n - • • -			
We want to invest in sustainable buildings, but there is no demand in this area.			• • • - -		
We want sustainable buildings. but there is almost no choice in the market.				• • • • • • •	n • • • •
General Information					
How do you understand the meaning of sustainability in condominium development and how do you pay attention?	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •
Are you interested or enthusiastic about sustainability in condominium development?	• • • • •	• • • • •	• • • • •	• • • • •	- • • • - -
Economic Profitability					
Are you interested or enthusiastic? How will the condominium be able to create value that is worth the investment?	• • p • •	• • • • •	• • - • •	• • • - - -	• p • - •
Are you willing to invest more in sustainable condominiums than normal buildings? Are you willing to work harder to develop a sustainable building?	• • • • •	• p - • -	- - p p p	• • - - p	• p • p p
Do you agree that to increase an investment budget to achieve sustainability will be beneficial in the short-run in terms of image and make people want to buy or live in this condominium? Will that make it worth the investment?	• p - • •	• • - • -	- p p • •	• n • - -	• • • - -
Do you agree that to increase an investment budget to achieve sustainability will be beneficial in the long-run in terms of increasing market demand and energy saving or easier maintenance that will make it worth the investment?	• • • • •	• • • • •	• • • • •	• • - • •	• • • - •
Do you agree that condominiums with sustainability concept will be easier to sell or rent than general condominiums?	• - - • •	• • p n n	• • n n n	• n n n n	• p n n n

(Continued)

Table A1. (Continued).

Sustainability Aspects	Sample Groups (5 persons of each group)					Potential Buyer
	Architect	Developer	Investor	Resident		
Do you agree that condominiums with sustainability concept will satisfy users or customers more than general condominiums?	• • - n n	• • p - -	• • n n n	• • • • p	• p - - -	
Environmental Responsiveness						
Are you interested or enthusiastic? How would the condominium be able to conserve energy/ the environment?	• • • • •	- p • • p	• - - • •	• • • p p p	p - • • - -	
How important is it for you to save energy, water, electricity or to create renewable energy in condominiums?	• - • • •	• • • • •	• • - • •	• • • • p p	• • • - -	
Do you consider how to design buildings for energy conservation, such as using natural light, green space design, and passive cooling design?	• • • n n	• • • • •	• - - - n	• • • n n	• • • - -	
How important is it for you to have condominiums that do not damage the environment or surrounding?	• • • • •	• • • • •	• - - - -	• • - - -	• • - - -	
Do you consider that your condominium needs to be built using ecofriendly materials and methods that do not damage the environment?	• p • • •	p n • • -	• - - - -	• • - - -	• - - - -	
How important for you are the standards that guarantee environmental conservation in condominiums such as LEED, and Thai Green Building standards.	• - - - -	• • - - -	• - - - p	• • • • -	• - - - -	
Social Awareness						
Are you interested or enthusiastic about how the condominium needs to have a good community and society?	• • • • •	• • • • •	- - - - -	• • • • -	• • • • •	
How important to you are the problems of transportation of the surrounding communities, such as traffic congestion, and building access?	• - • • •	• • • • •	- - - - -	• • • - •	• - - • •	
How important is it for you to create or design activities between residents and external communities? Have you ever participated? How is your relationship between internal and external communities?	- - • - -	• • - - -	- - - - -	• • - - -	p - • - -	

(Continued)

Table A1. (Continued).

Sustainability Aspects	Sample Groups (5 persons of each group)				
	Architect	Developer	Investor	Resident	Potential Buyer
Do you focus on how to create understanding with the external community about changing areas and environment due to your project development?	• • • • •	• • • • •	• - - - -	• n - - -	- - - • •
Do you think that your condominium is acceptable to the existing community and society? Why or why not?	• • • • n	• • • n •	n n n n n	• • • • •	n n • • •
Are you happy to live in your condominium?	n n n • •	n n n • n	n n n n n	• • • • •	n n p • •
Aesthetics and Functional					
Are you interested or enthusiastic about the condominium being beautiful?	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •
Do you consider whether the condominium should be easy to use and maintain?	• • • • n	• • • • •	• - - • p	• • • • •	• • • • •
Do you consider whether the condominium should be beautiful and compatible with the surrounding environment?	p p • - •	p • • - -	• - - - •	- • - • •	- - n n
Is it important that the condominium must be compatible with the site history?	p - • p •	- • • - •	- - - - -	- - - - -	- - - • -
Do you focus on whether the condominium design considers the universal design concept?	• • • - •	• • • • •	• - • • p	• • • - •	• • • p p

Remark: • = Agree, - = Disagree, n = Not available, p = Probably.