

The Perception of Investors on Real Estate Sustainability in Ghana

Isaac Doku¹

Lecturer, Datalink Institute, Tema, Ghana

Sonal Agarwal²

Dean, Datalink Institute, Tema, Ghana

Email: sonal.mitali@gmail.com

DOI Link: <http://dx.doi.org/10.6007/IJARBSS/v6-i4/2105>

Published Date: 16 April 2016

Abstract

The study seeks to find out the perception of investors on sustainability in line with the triple bottom line approach of sustainability in the real estate sector of Ghana. Research data was collected using survey questionnaires to solicit the views of targeted real estate investors in Ghana. The data collected was analysed using cross tabulations, mode, median, minimum and maximum values. The findings pointed out that real estate investors in Ghana are unsure of the economic benefits of green building, but have displayed a serious conviction that green buildings are socially and environmentally viable.

Keywords: Green Building, Sustainability, Investors, Real Estate, Ghana

1 Introduction

Climate change and its resultant global warming has been a major topic of discussion on most environmental platforms worldwide, including the 2014 United Nations Conference held in New York and the 2015 Sustainable Development Goals (SDG) linked to the Millennium Development Goals (MDG) worldwide. These have led to several worldwide initiatives to combat this growing menace. Foremost of these initiatives is the Kyoto protocol, which sought to tackle global warming by ensuring that participating nations minimize greenhouse gas emissions by 18 percent for the period 2013 –2020, in order to manage properly the environment and natural resources in a sustainable way.

Arnel (2010) intimated that buildings contribute around 30% of greenhouse gas emissions globally. This is because buildings thrive on vast amounts of resources, including building material such as water, cement from limestone and energy use. Yet, possibilities for causing damage to the natural environment present themselves throughout the entire process, from

¹ Data Link Institute, P.O.Box C0 2481, Tema. E-mail: isaacoberkoh27@gmail.com,

² Data Link Institute, P.O.Box C0 2481, Tema. E-mail: sonal.mitali@gmail.com,

inception to completion of construction projects. Lorenz et al. (2007) postulated that the built environment constitutes 25 – 40 percent of total global energy use and pollution emission, 30 percent of raw material use, 30 – 40 percent of global greenhouse gas emissions and 30 – 40 percent solid waste generation and consumption. As a result, sustainable development in the real estate sector has been suggested as the way forward.

The concept of sustainability has widely been discussed on varying platforms primarily because of the need for the world to have an enduring concretely built environment to reduce the impact on the resources of the earth and especially on climate change by humans. The real estate industry platform is not an exception from these platforms; “sustainable real estate project” is not even a new phenomenon anymore in this modern era but has become a topic for discussion all over the world (Warren-Myers, 2012). As a matter of fact, there has been a significant change in commercial real estate markets worldwide with a move towards incorporating sustainability in real estate portfolios (DeFrancesco and Levy, 2008). Many real estate trusts and funds across the globe claim to have increasing levels of sustainability in their portfolios, corporate social responsible reporting, certification and a list to demonstrate that their level of sustainability goes on (Newell, 2008).

Brundtland (1987) defined sustainable development as the kind of development that is able to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. This can be achieved in the real estate sector if real estate investors and owners take into consideration not only the financial gains but also against the triple bottom line policy. The triple bottom line is a business phenomenon that has gradually crept into the real estate industry, due to the call for sustainability. It is of the idea that managers should not evaluate their businesses performance against the financial bottom line alone, but also against environmental and social bottom lines.

According to Warren – Myers (2012), the focus on sustainability in terms of the triple bottom line is to concentrate on reducing the environmental footprint of buildings, and suggested that this can be done by reducing production of greenhouse gas emissions (particularly carbon dioxide) and reducing the use of natural resources, particularly water, gas and electricity. There is the need to reduce waste production and increase recycling, to enhance building occupant comfort, health, safety and clean environment. Production of renewable resources and collection of water for potable and non-potable uses, recycling and treatment of sewage and waste water are to be considered.

According to the Ghana green building association, the traditional or conventional concrete and wood buildings consume about 45% of the world’s total energy use and accounts for 35% of the world’s CO₂ emissions. Furthermore, the built environment accounts for 40% of municipal solid waste and 50% of ozone – depleting CFC. There is the need for sustainability in the built sector to help curtail this growing menace.

This study investigates investor perceptions of what sustainability means in line with the triple bottom line approach of sustainability, which is social, economic and environmental factors and their applicability to the real estate sector of Ghana

This study is organised into five main sections. This section is the introduction, followed by literature review. The third and fourth sections examine the methodology and findings of the study respectively. The final section concludes the study and makes appropriate recommendations.

2 Literature Review

In 1998, the Green Building Council (USGBC) of US developed the LEED system as a certification program for sustainable building standards as a new development in building construction. The LEED system has gained a lot of attention from owners and developers in the U.S. commercial real estate sector. Since then, several studies on green buildings or LEED certified buildings have been conducted (Blumberg, 2012). Most studies on sustainable buildings found out that green buildings increase the capital cost of construction. That is why most real estate owners, investors and contractors shy away from it. Then the question arises that, are there some benefits that can be gained in green building?

In the US, due to the availability of the CoStar data, several researchers have tried finding answers to the benefits/premiums in adapting to green or LEED certified buildings. Eichholtz et al. (2009) explained that LEED rated buildings save water and energy-related costs that greatly benefit inhabitants. These cost reserve funds may draw in more inhabitants or propel them to pay more for such real estate buildings. Miller (2010) added that, they also improve indoor natural quality, expands efficiency and abates worker sick days, increasing the value of organisations and inhabitants occupying the building and commands higher market value and rate

Kok et al. (2012) studied profits that real estate firms could make by investing in green building in US by focusing on LEED buildings spanning from 2005 to 2010. The study compared the amount required for investment and with rents and occupancy rates. The views of building owners were sought in terms of their attitudes towards the benefits and costs of upgrading a house to green building. The results indicate that investment in green retrofits or upgrading your house to incorporate green features is economically viable in US.

In New Zealand, Smith and Baird (2007) found that energy cost is in the ascendency, necessitating the establishment of sustainable buildings. Although tenants lay less emphasis on cost savings in terms of their operating costs, but places a higher value on the intangible benefits, such as productivity, staff attraction and retention, and reduced sick leave and absenteeism.

The idea of sustainability is gradually entering developing economies like Africa. In Nigeria, Babawale and Oyalowo (2011) evaluated the perception of real estate valuers' on sustainability. Surveyors and valuers were asked to rate the significance of a range of sustainability features on the market value of a property based on social, economic and environmental features constituting the triple bottom line of sustainability. The findings showed that even in a developing country like Nigeria, there is already a growing concern to inculcate sustainability into real estate valuation. The only problem is that people conceptualise sustainability in terms of its social, rather than economic or environmental features. Since Ghana and Nigeria are all developing sub-Saharan African countries with similar institutions and structure, this study finds out whether investors in Ghana perceive sustainability in like manner.

3 Methodology

Prior studies in the area were carefully examined in order to design a questionnaire that will address the objectives of the study. Most sustainable or green building researches focus on valuers, surveyors and building contractors ignoring the view point of investors. Meanwhile, this entire people work upon demand by investors. That is why the target group of our study is investors.

The study makes use of both open-ended and close-ended survey questions in order to gain a better understanding of the market dynamics around sustainability through owners' perceptions of sustainability in the market (Warren-Myers, 2012). The questionnaire is divided into two main sections; Section A analysis the demographic profile of respondents and Section B analysis the perception of investors in line with the triple bottom line. The demographic profile of respondents included their age, gender and experience.

With the second section, real estate investors were asked 8 questions under the financial bottom line, 6 questions under the social and 4 questions under the environmental bottom lines following the procedure by Addae-Dapaah et al., (2009). The generation of data on environmental indicators is relatively easy to come by owing to the scale of detailed research that has been carried out in the area in recent studies. However, the development of social and economic sustainability indicators presents a challenge due to the paucity of data in this area. Thus, we had to rely on variables employed in Addae-Dapaah et al. (2009), Babawale and Oloyawo (2011) and Boyd (2005). Following the procedure by Addae-Dapaah (2009), the study will make use of internationally accepted sustainability indicators, most of which has been pre-tested in previous studies in the developed countries.

All questions regarding the triple bottom line were close ended questions. In order to evaluate the perceptions of investors on the triple bottom line, a five point likert scale ranging from 1 to 5 with 1 representing not significant to 5 which represents significant will be used (Babawale and Oloyawo, 2011). The target population for this study includes investors in the real estate sector and members of the Ghana Green Building Council, Chief Executive Officers (C.E.O's), General Managers, Senior Fund Managers and Portfolio Managers of real estate firms in Ghana. The main area of study is the Greater Accra Region because, almost all real estate companies in Ghana have their head office in the capital city. Although it is very difficult to reach the targeted group (investors), we set as a proxy all C.E.O's and senior management officers as investors for privately owned firms in the study.

The data analysis will take two forms: firstly, the study will make use of content analysis and then, in order to gain greater understanding of the frequency and strength of responses and attitudes, the data will be coded and quantified to allow for statistical analysis.

A total of 60 questionnaires were sent to the C.E.O's and management of 30 real estate firms. During data collection it was realized that, firms under study are self-financed by either the CEO or General Manager, if they needed more funds; they go for loans using collateral. Tema Development Corporation is financed by the government. This implies that management of the real estate firms under study are by themselves investors. 70% of the questionnaires were retrieved, yet 12 questionnaires were not properly filled, which were eliminated. The real estate firms that were finally included in the study amounted to 15 with 30 respondents. Most real estate firms in Ghana are situated within Tema and Accra, all in the Greater Accra Region, due to that all the sampled firms were drawn from this location.

4 Findings

Analysis of data is carried out in two main subsections. The first part examines the demographic profile of respondents using tables and charts. The second part analysis the results using cross tabulations, mode, median, minimum and maximum values.

4.1 Demographic Profile of Investors

Table 1 below is a cross tabulation between qualification and age of respondents. The table indicates that 27 out of the 30 respondents are below 40 years and only 10% of the respondents are between 40 to 49 years. These imply that most of the respondents are

youthful and can easily adapt to new technologies such as green building. 25 out of the 30 respondents pointed out that they have bachelor and master degrees. Only 16% of the respondents asserted that they have diplomas, indicating that all the respondents have at least some form of tertiary education.

Table 1:

A crosstabulation of Qualification and Age of respondents

		Age of respondents			Total
		21-29 years	30-39 years	40-49 years	
Qualification of respondents	Diploma	2	3	0	5
	of Degree	7	10	2	19
	Masters/Ph D	3	2	1	6
Total		12	15	3	30

Source: Author's own computation from June, 2015 Survey

The findings showed that 63% of the respondents have between 3-6 years working experience in the real estate sector. The figure further indicates that 10% of the respondents have above 10 years working experience, with 17% having between 6-10 years working experience. Although the respondents are youthful, they have tremendous working experience with 27% having more than 6 years working experience.

4.2. Scope of Knowledge of investors on Sustainability

To be able to know the scope of knowledge of real estate investors, respondents were asked whether they are aware of green building and the role green building is playing in real estate sustainability globally. The findings from table 3 below points out that 83% of real estate investors are aware of green building, whereas only 17% are unaware of green building. The results further indicate that the more educated an investor the higher the likelihood that the investor will be aware of green building. 40% of investors who are diploma holders are not aware of green building, whereas 89% and 83% of bachelor's degree and master's degree holders are aware of green building. This result is in contrast to the study by Dzokoto and Ohemeng-Ababio (2014) who concluded in their study that most Ghanaians are not aware of green building. The result indicates otherwise because of the establishment of the Ghana Green Building Council and their green building sensitization role, of which most real estate workers and investors are a part. Soon, all real estate stakeholders will fully grasp the concept and begin to demand for sustainable building.

Table 2:
Crosstabulation between Qualification of respondents and awareness of green building by respondents

		Are you aware that green building is playing a major role in real estate sustainability		Total
		yes	no	
Qualification of respondents	Diploma	Count 3 % within Qualification of respondents 60.0%	2 40.0%	5 100.0%
		% within Are you aware that green building is playing a major role in real estate sustainability	40.0%	16.7%
		Count 17 % within Qualification of respondents 89.5%	2 10.5%	19 100.0%
	Degree	% within Are you aware that green building is playing a major role in real estate sustainability	40.0%	63.3%
Masters/PhD		Count 5 % within Qualification of respondents 83.3%	1 16.7%	6 100.0%
		% within Are you aware that green building is playing a major role in real estate sustainability	20.0%	20.0%
		Count 25 % within Qualification of respondents 83.3%	5 16.7%	30 100.0%
	Total	% within Are you aware that green building is playing a major role in real estate sustainability	100.0%	100.0%

Source: Author's computation

4.3 Evaluation Test of Key Sustainable Factors

The second objective of the study is to conduct an evaluation test of key sustainable factors in line with the triple bottom line approach: economic, environmental and social factors. Here, respondents were asked to rank from 1 to 5 the benefits of green building, where 1 represents not important, 3 neutral and 5 is very important. The study employs median, mode and standard deviation in analyzing the data. Mode indicates the most occurring number, statistically the number with the highest frequency or the choice of most respondents.

4.3.1 Economic Benefits

Under economic factors, respondents were required to answer two major questions, as to whether green building leads to higher firm value or not and whether green building saves cost?

Table 3:
Higher Building Value

	Higher building value secures higher rents	Higher building value leads to faster tenants lease up	Higher building value leads to higher valuation premiums	Higher building value leads to better market distinctions	Higher building value leads to higher prestige
Median	3.50	3.00	3.00	4.00	4.00
Mode	3	2	3	3	3
Minimum	2	2	2	3	3
Maximum	5	5	4	5	5

Source: Author’s computation

Table 3 above indicates that, most real estate investors under study are unsure whether higher building value associated with green buildings will lead to securing higher rent by a mode of 3. In terms of tenant lease up, the findings indicated a mode of 2 to explain that most investors do not agree that green buildings lead to higher tenant lease up in Ghana.

Column 4 of table 3 above shows that, majority of real estate investors in Ghana do not know whether green buildings will attract higher valuation premiums or not by a mode of 3. Column 5 and 6 showed a mode of 3 each to indicate that most respondents are unsure whether green buildings will lead to better market distinction and higher prestige or not.

Table 7 below explains the cost saving benefits of green building under economic benefits

Table 7: Cost Savings

	Cost savings in terms of water conservation	Cost savings in terms of energy conservation	Cost savings in terms of lower maintenance cost	Cost savings in terms of accelerate Planning approvals
Median	4.00	3.00	3.00	3.00
Mode	4	3	2	3
Minimum	2	2	2	1
Maximum	5	5	5	4

Source: Author's computation

Column 2 of table 4 above shows a mode of 4 which indicates that, majority of real estate investors in Ghana agree that green buildings save cost in terms of water conservation. Most investors are unsure whether green buildings are energy efficient or not, same applies to jurisdictional approvals by a mode of 3. Column 4 of table 4 above indicates that investors in Ghana disagree that green buildings lead to cost savings through lower maintenance cost in Ghana.

For economic benefits, table 3 and 4 above indicates that real estate investors in Ghana are unsure of such benefits, if any at all it will be small. The reason is that most of the variables showed a mode hovering around 3. This might be because most real estate investors do not have much experience with green buildings although they have heard of it. This calls for the construction of more green buildings in Ghana to serve as case studies for real estate investors to broaden their knowledge base.

4.3.2. Social Benefits

Under social benefits of green buildings, respondents were required to show how green buildings help in improving productivity gains, in terms of reduction in health and safety risks, higher morale, improved indoor air quality, less comfort related problems by respondents, user satisfaction, and users having more control over their environment. Table 5 below shows the results of respondent

Table 5; Social Benefits

	Reduces health and safety risks	Gives higher morale	Improved indoor air quality	Less complaint on comfort related problems	Higher user satisfaction	Having control over environment
Median	4.00	4.00	4.00	3.00	4.00	3.00
Mode	4	4	5	3	4	4
Minimum	2	2	2	1	2	2
Maximum	5	5	5	5	5	4

Source: Author's own computation

The table above explains that most investors in Ghana strongly believe green building leads to a reduction in health and safety risk, with a mode of 4 and a maximum value of 5. Greater number of investors further indicated that green buildings provide a highly improved indoor air quality with a mode of 5 and a maximum value of 5. Majority of respondents are unsure whether it will reduce complaint on comfort related activities, since man is by nature insatiable.

Other factors such as higher morale, higher user satisfaction and user control over their environment all have showed a mode of 4, indicating that majority of respondents are aware that green buildings provide higher morale to inhabitants, residents are always satisfied with their accommodation, and aids users in taking control over their environment. This implies that investors are aware of the social benefits of green building, although they are not sure of the economic benefits.

4.3.3 Environmental Benefits

The final factor of the triple bottom line we considered is the environmental factor. Variables such as reduction in pollution, fight against global warming, waste minimisation and sustainability (Not jeopardizing future generation needs) were used in determining the environmental benefits of green building as can be seen in table 8 below

Table 6:
Economic Benefits of Green Building

	Sustainability of the environment	Less pollution of the environment	Reduce the environmental impact of global warming	Waste minimisation in our environment
Median	4.00	4.00	5.00	4.00
Mode	4	4	5	5
Minimum	2	2	3	2
Maximum	5	5	5	5

Source: Author's own computation

As can be seen in the table above, real estate investors have revealed that green building reduces pollution of the environment with a mode of 4 and a minimum value of 2 and a maximum value of 5. A minimum of 2 indicates that none of the respondents view pollution reduction by green buildings as irrelevant. Real estate investors have further indicated that green building will reduce global warming by a mode of 5 and a minimum value of 3. Waste minimisation showed a mode of 4, which implies that respondents strongly believe that green buildings help in minimizing waste. This result might be due to the widespread view that there is too much carbon emissions by China and USA, this problem can be mitigated by sustainable practices such as green building. This information has been over emphasized on international

platforms that have kept real estate investors informed of the environmental benefits of green building.

Real estate investors in Ghana have showed that they are unsure of the economic benefits of green building, but have displayed a serious conviction that green buildings are socially and environmentally viable and good for Ghana and the world at large. This result is similar to the findings by Babawale and Oyalowo (2011) in Nigeria.

5 Conclusions and Recommendation

The main objective of the study is to find out the perception of real estate investors regarding sustainability using the triple bottom line approach. The findings of the research show that, although most investors know about green building, they have no experience and exposure toward it. As a result, doubts the cost effectiveness of it but trusts the social and economic benefits of it. The reason why investors are unwilling to delve into green building looks more psychological than factual.

Green building can permeate the built industry of Ghana only if government involves itself in it, to serve as a reference point to all investors and introduce policies of inculcating green features in the built sector, then the country can make headway. With that, investors can assess the financial benefits of green building and be motivated to invest into it.

References

- Addae-Dapaah, K., Hiang, L. K., and Sharon, N. Y.S. (2009). *Sustainability of sustainable real property development*. Journal of Sustainable Real Estate, Vol. 1 No. 1.
- Ang, S.L. and Wilkinson S. J. (2008). *Is the social agenda driving sustainable property development in Melbourne, Australia?* Property Management, 2008, 26:5, 331–43
- Arnel R. (2010): *Tackling global climate change; Meeting local priorities*. World Green Building Council Special Report, September, P. 1.
- Babawale, G. K. and Oyalowo B. A (2011); *Incorporating sustainability into real estate valuation: The perception of Nigerian valuers*. Journal of Sustainable Development, Vol. 4, No. 4.
- Bond, S. (2010). *Best of the best in green design: Drivers and barriers to sustainable development in Australia*. PRESS Conference, Sydney.
- Brundtland, G.H. (1987). *Our common future*. Report on the World Commission on Environment and Development. Oxford: Oxford University Press.
- Cannon, S.E. and Vyas, U. (2008). *Green building: Balancing fact and fiction*. Real Estate Issues, 33:2, 2–5.
- Consultative Citizens' Report Card (2010). *The city of Accra*. The International Bank for Reconstruction and Development/The World Bank 2010, 1818 H Street, N.W. Washington, DC 20433.
- Chua, Y. L. (2007). *Real estate sustainability – A Singapore perspective*. Jones Lang Lasalle
- DeFrancesco, A.J. and D. Levy (2008). *The impact of sustainability on the investment environment*. Journal of European Real Estate Research, 2008, 1:1, 72–87.
- Dixon, T., Colantonio, A., Shiers, D. E., Reed, R. G., Wilkinson, S and Gallimore, P (2008). *A green profession: A global survey of RICS members and their engagement with the sustainability agenda*. Journal of Property Investment and Finance, 26, 460–81.

- Eichholtz, P., Kok, N., & Quigley, J. M. (2009b). *Why companies rent green: CSR and the role of real estate*. Paper presented at the Academy of Management Annual Meeting Proceedings.
- Fuerst, F. and McAllister, P. (2008). *An investigation of the effect of eco-labeling on office occupancy rates*. *Journal of Sustainable Real Estate*, 1, 49–64.
- Goering J. (2009): *Sustainable real estate development: The dynamics of market penetration*. *Journal of Sustainable Real Estate*, 1.168-201.
- Fisk, W.J. (2002). *How IEQ affects health, Productivity*. *ASHRAE Journal*, 44:5, 56–60
- Häkkinen, T., & Belloni, K. (2011). *Barriers and drivers for sustainable building*. *Building Research and Information*, 39(3), 239-255.
- Holmes, J. and Hudson, G. (2001). *The application of BREEAM in corporate real estate: A case study in the design of a city centre office development*. *Journal of Corporate Real Estate*, 5:1, 66–78.
- Hydes, K., & Creech, L. (2000). *Reducing mechanical equipment cost: The economics of green design*. *Building Research & Information*, 28(5/6), 403-407.
- Kok, N., & Jennen, M. (2012). *The impact of energy labels and accessibility on office rents*. *Energy Policy*, 46, 489-497.
- Lorenz, D.P (2006). *The application of sustainable development principles to the theory and practice of property valuation*. Volume 1 of *Karlsruher Schriften zur Bau-, Wohnungs- und Immobilienwirtschaft*. University of Karlsruhe, Germany.
- Lorenz, D.P., Truck, S., and Lutzkendorf, T. (2007). *Exploring the relationship between sustainability of construction and market value: Theoretical basics and initial empirical results from the residential property sector*. *Property Management*, 25:2, 199–48.
- Kats, G. (2003): *The costs and financial benefits of green buildings. Sustainable building task force*. A Report to California's Sustainable Task Force.
- Miller, N. (2010). *Does green still pay off?* Retrieved Nov 28, 2011, from Costar Group
- Miller, N., Spivey, J., & Florance, A. (2008). *Does green pay off?* *Journal of Real Estate Portfolio*.
- Muldavin, S. (2009): *Underwriting sustainable property investment*. San Rafael, California, Green Building Finance Consortium.
- Murillo-Luna, J. L., Garcés-Ayerbe, C., & Rivera-Torres P. (2011). *Barriers to the adoption of proactive environmental strategies*, *Journal of Cleaner Production*, 19(2011), 1417-1425.
- Newell, G. (2008): *The strategic significance of environmental sustainability by Australian-listed*
- Newell, G., MacFarlane, J. and Kok, N. (2011). *Building better returns*. [http://www.lowcarbonaustralia.com.au/sites/default/files/upload/Property Trusts](http://www.lowcarbonaustralia.com.au/sites/default/files/upload/Property%20Trusts.pdf). *Journal of Property Investment & Finance*, 26:6, 522–40.
- Phillips, C. (2003). *A place of sustainable development*. British Isles: Wiley-Academic.
- Robinson, J. (2005). *Property valuation and analysis applied to environmentally sustainable development*. Paper presented In PRRES, 11th Pacific Rim Estate Society Conference 2005, Melbourne, 23-27. Australia:Melbourne.
- Roper, K.O. and Beard, J.L. (2006). *Justifying sustainable buildings—Championing green operations*. *Journal of Corporate Real Estate*, 8:2, 91–103.
- Rubin, J. and Tal, B. (2007). *Does Energy Efficiency Save Energy?* CIBC World Markets, *StrategEcon*, November 27, 2007.

- Rydin, Y., Amjad, U., Moore, S., Nye, M., & Withaker, M. (2006). *Sustainable construction and planning. The academic report. centre for environmental policy and governance*, The LSE Sus Con Project, CEPG, London School of Economics, London.
- Smith, J. and G. Baird (2007). *Implementation of a building sustainability rating tool: A survey of the New Zealand building industry*. Proceedings of the SB07 New Zealand Conference, Auckland. Auckland, New Zealand: New Zealand Sustainable Building Conference.
- Torvestad, G. R. (2004). *The role of sustainability in real estate finance and investments*. California Polytechnic State University.
- Turban, D.B. and Greening, D.W. (1996). *Corporate social performance and organizational attractiveness to prospective employees*. *Academy of Management Journal*, 1996, 40:3, 658–72
- Warren-Myers, G. (2012). *Sustainable management of real estate: Is it really sustainability?* *Journal of Sustainable Real Estate*. Volume 4, Number 1-2012.
- Wasiluk, K.L. (2007). *Profit and the business case for sustainable commercial buildings*. Atlassian Confluence, 2007.
- Wiley, J., Benefield, J. and K. Johnson, K. (2010). *Green design and the market for commercial office space*. *Journal of Real Estate Finance and Economics*, 41:2, 228–43.
- Williams, K., & Dair, C. (2007). *What is stopping sustainable building in England? Barriers experienced by stakeholders in delivering sustainable developments*. *Sustainable Development*, 15(3), 135-147.