Open Science

Barriers to Sustainable Property Development in Lagos Metropolis

Olanipekun T. A.

Department of Estate Management and Valuation, School of Environmental Studies, Yaba College of Technology, Yaba, Lagos, Nigeria

Email address

alabaolanipekun@yahoo.com

Abstract

The paper investigated the barriers to sustainable property development in Lagos Metropolis. 310 questionnaires were administered in all, some to registered professionals in built environment and others to member of Real Estate Developer Association of Nigeria (REDAN) based in Lagos of which 74.19% were retrieved and descriptive statistical tool was used to analyse data collected. *It was discovered that professionals lack requisite educational knowledge in sustainable property development and it was not part of the curriculum while acquiring knowledge in higher institution. Finance was a major barrier to real estate developers in the study area and the fact that there is lack of demand on the part of occupier for sustainable property. The paper recommended that professionals in the built environment should take refresher courses on sustainable property development and that Institution of higher learning should include sustainable property development in their course curriculum.Government and financial institution can come up with a special loan arrangement for developers that are willing to embark sustainable property development.*

1. Introduction

The conventional buildings (also refers to as non green building) make use of vast amounts of energy, land, water, and raw materials for their development (Klein, Drucker and Vissier, 2009). Such buildings are said to be responsible for around 30 % of green house gas emissions globally (Arnel, 2010). In United Kingdom, Deloittee (2014) reported that buildings generate 45% of the green house gas (carbon dioxide) emission at various stages of UK building life cycle from design to construction and ultimately to operational stage and end of life activities. According to IPCC report cited by Jain, (2013) buildings in India is said to produce 10% of emission gas in that country. The emission figures from United State of America are worse: buildings are estimated to represent 70% of all energy use and 38% of all Co2 emission (Parsons, 2009). As pointed out by Ajayi, (2014) there are no figure available on building emission in Nigeria the position however is likely to be worse due to the fact that there is frequent power outage which forces occupiers of residential, commercial and industrial buildings to depend on generator for power supply.

The impact of property sector on the environment led to the establishment of the World Green Building Council (WorldGBC) in 2002. (Bond and Perrett, 2013). Ajayi (op cit) opined that the world response to the concern of deteriorating state of the human environment has been an increasing focus on how to develop sustainably. Nigeria needs to embrace and encourage the development of green building as a global initiative that is critical to sustainability of tomorrow's built environment.

It is however worrisome that a country with very low electricity generation of about 4,000 megawatts for a population of 170 million people and a daily consumption of an average of 40 million liters of petrol/diesel for private generation of electricity (according to Oliyide, 2014) is not taking a proactive step at curtailing the emission of gas, effective and efficient use of available power generated. In a recent study conducted by Oladokun (2010) the awareness of green buildings and sustainable management practice in the country was found to be practically nonexistent.

This is probably why (according to Business Day, 2014) there is only one green building presently being constructed

in Nigeria. This building called the Heritage Place- is now in advanced stage of construction and is expected to be added to stock of the Lagos property market by the last quarter of 2015. The office complex which consists of 14 floors on completion is estimated to hold promise of 20% reduction in energy cost for tenants. It is at present the only known commercial building in Nigeria to seek and achieve LEED certification in both design and construction.

Over ten (10) years that the issue of sustainable property development has been ongoing in other part of the world, Nigeria is to have her first sustainable property development delivered in 2015. Why the delay in imbibing the concept of sustainable property development. One may asked are there any barriers to the slow pace in the adoption of sustainable property development in Nigeria. For countries that have adopted the concept of sustainable property development what are the driving forces? This paper aims at providing answers to the above questions using Lagos metropolis as a study area.

The rest of this paper proceeds as follows. The next section provides a brief review of the relevant literature. This is followed by research methodology and a short discussion on the study area after which the results of the data analysis are presented and findings discussed. Following this section is recommendations and the last section is devoted to concluding remarks.

2. Literature Review

Property development projects can adversely affects the environment if not properly planned, executed and managed (Bala and Ighalo 2012). As such the relationship between property development and the environment is of great importance in order to ensure sustainability. Professionals in building industry especially in developing countries need to incorporate element of sustainable environmental development in property development project. Similarly, Dunbar (2003) pointed out that the relationship that exist between the design of new property development and the impact it can have upon the image and quality of the local environment needs to be taken into consideration at the early stage of the development. Failure to do that is threat to human health, safety, security, comfort and aesthetic value of the environment (Bala et al op cit).

Several studies have shown the barriers of sustainable property design, development and management. The barriers of sustainable property development reside round the stakeholders. These stakeholders include investors / developers / or property owners, government at all levels (federal, state and local) and its agencies, professionals in the construction industry, occupiers and the general public.

3. Investors/Developers/Property Owners

In the word of Odigwe (2014) most real estate developers

and home owners are reluctant of constructing green building because they believe it will belittle their social status, hence the misleading impression by people who can constantly fuel their cabin generator that they don't need renewable sources. Similarly sustainable buildings carry a stigma which is reflected in an in correct notions that sustainable buildings are for "alternative life styles", have limited resale appeal are a high risk investment, have poor aesthetic appeal compared to conventional buildings (Buys, Barnelt, Miller and Bailey, 2005). Van-Bueren (2001) was of the opinion that this made people to develop "image" concerns, such as fear of being stigmatized as a radical ecologist.

The cost of developing a property in a sustainable manner is another barrier to investors in real estate development. As observed by Zhang, Platten and Liyin(2011) the higher costs has hindered the extensive application of green building technology in China. Similarly high cost was cited as a barrier inhibiting the construction of sustainable buildings (Van-Bueren, op cit). Meanwhile research on cost of green buildings has identified only a slight cost increase of between 2 and 5 percent compared to conventional buildings (Circo, 2008 in Henry, Ross and Harold 2012). The result is similar to the findings of Katz (2003) on building "green" commercial buildings were it was discovered that approximately 2 percent over the cost of developing conventional commercial buildings will be required to develop a green commercial building. In a research conducted by katz (op cit) where costs and benefits of green building were examined. It was discovered that the average cost premium over just building to code is less than 2 percent. In the study it was reported that a minimal increase in upfront cost about 2 percent to support green building would in turn resulted in a life cycle saving of 20 percent of the total construction costs more than ten times the initial investment.

In addition, there is the perception that sustainable building cost more compared to conventional buildings. Davis (2007) asserted that there is no significant difference in average costs for green buildings as compared to conventional buildings. According to Choi (2009) the benefits of green buildings are only evident over the longer period. This could be why it was recommended that documenting and communicating the cost, benefits and performance of green buildings as part of the strategy to increase adoption of green building practices.

Furthermore, incentives are not strong enough to change behaviour, energy prices are still low and tax and other political incentives are not significant enough to change behaiour. Ajayi (2014) put it this way that if a state government wants to encourage environmental responsible real estate development, one of the most powerful tools it can use is tax incentive. However, split incentive between landlords and tenants is another barrier to sustainable property development, a situation where the landlords are investing in green building and the tenants are benefiting through reduced energy and water costs, greater productivity etc seems not to encourage the landlord. The low level of knowledge affects all stakeholders.

Another barrier to investors/developers is the cost and logistic involved in importing the required green technology such as solar panels, wind turbines and advance building management system. Perhaps the reason why it was said that there is limited availability of new technology. Odigwe (2014) opined that ideas have grown strong roots in North America, Europe, Asia and Australia will invariably come to Africa no matter how foreign they may seem in the short run. The very reason why Nigerian government need to do all she can to ensure that her citizen are not caught unaware.

4. Government at All Level

The existing researches have established that government is a key player in term of promoting green building in the construction industry. Government can influence the construction industry by a variety of instrument. Regulatory instruments and incentive instruments are the main tools for governments to develop green building (Yung and Chan 2002). These instruments are not being used by the Nigerian government, possibly the reason for the level of green building development in Nigeria. Similarly the lack of government intervention in Nigeria promoting sustainable property design development and management was pointed out by (Ajayi, 2014). The study further reveals that if government wants to encourage environmentally responsible real estate development, one of the most powerful tools it can use is tax incentive.

At present in the country (Nigeria) there is the absence of certification and rating agencies like LEED and Energy Star. There is also the absence of training programme on sustainable management practice including the absence of sustainable property management education in university and polytechnic curricula (Oladokun, 2010). Van bueren (2012) opined that legal and administrative barrier such as certification process and problems of obtaining planning permission have been cited as a barrier to fostering more sustainable building.

Seyfang (2010) argues that in the United Kingdom many planners are unfamiliar with low environmental unpact-niche building technique, such as straw bale construction, "indeed, one of the main barrier facing green sustainable housing inches is posed by planning regulations and building standards which were not design with these building methods in mind". Aliagha, Sanni and Ali (2013) further reaffirm the influence of rules and regulations by stating that the status quo in rules and regulation, organization disinterest and local authority enforcement as hindrances to foster progress of green housing in Malaysia.

5. Professionals in the Construction Industry

Expertise knowledge is a key factor to promote sustainable property development (Miyavake, 1996). It was however observed by Samari Godrati, Esmacilifar, olfat and Shafur

(2013) that the level of general awareness about sustainable buildings and theirs benefits among the construction professionals is low (below moderate). The lack of expertise's knowledge in green building development creates an environment that lengthens development time frames (Choi 2009). Information and expertise in the country about sustainability and green building with its immense benefits is still relatively modest. The low level of knowledge affects all the professionals.

In South Africa, Hankinson and Breytenbach (2012) pointed out that sustainable designs are not taught in Technikon or university. Oladokun (2010) collaborated this by saying that there is absence of sustainable property management education in university and polytechnic curricula in Nigeria. This implies that there is absence of training program on sustainable property design, development and management. The professionals involved in sustainable design projects lack the requisite experience.

The professionals are to render service to clients who express interest in sustainable property development. It was however discovered that during implementation, various factors inevitably deterred their commitment to the sustainable property approach. This often resulted in the client disregarding sustainable design.

6. Occupiers

Lack of knowledge about the opportunities, implementation, or coordination of sustainable building projects has stymied them in some cases (Van Bueren, 2001). Lack of public knowledge may also be a factor in the slow uptake of sustainable property development. The public may as well lack awareness in initiating sustainable building features such as rebates and grant (O'leary, 2008). There is no evidence to demonstrate the benefit of green building to occupiers. The incomes of occupiers to be are too low and the property rental value is quite high.

Meanwhile the benefits of green buildings, talking about environmental benefit does not in any way induce occupiers to go green. The benefits that statistically significantly tilt the will of occupiers towards investment in and/or occupation of green building are cost saving and higher building value (Addae-Dapaah, Haing, and Sharon, 2009).

The low level of knowledge affects all the stakeholders. As observed by Oliyide (2014) it is not widely known in the country that energy consumption for green building is low, while consumption for non green building is high.

7. Research Methodology

The target populations for this study are registered professional in the built environment and registered Real Estate Developer Association of Nigeria (REDAN) based in Lagos state. The website of REDAN was visited in order to come up with the sample size. Although the association claimed to have over 1,500 member Only 41 member had their detail on the association website. 38 out of the 41

member were based in Lagos. These members were merged with member who registered with Federal Mortgage Bank of Nigeria (FMBN). The data for the study was collected from registered professionals in the construction industry and registered developers in situated in Lagos metropolis. Systematic sampling method was used to administer questionnaire to 250 professionals in built environment and 60 registered real estate developers. 310 questionnaires were administered in all of which 230 were retrieved and analyses was done using SPSS. Data collected centers on the various factors hindering the sustainable property development and the level of sustainable property development was investigated. The parameter used in assessing the opinion of the respondents was scaled based on its importance. Five points likert scaled were used to assess all variables considered.

8. Discussion of Findings

Table 1. Background information of professionals in built Environment in the study area.

Background information	Respondents	Percentage
Age Group		
21-29	21	11.5
30-39	62	34.1
40-49	23	12.6
50-59	65	35.7
60-69	11	6.0
Total	182	100
Gender		
Male	142	78.0
Female	40	22.0
Total	182	100
Academic Qualification		
PhD	4	2.2
MSc	108	60.3
BSc/HND	67	37.4
Total	179	100
Professional Membership		
Student	11	6.0
Probation	40	22.0
Associates	78	42.9
Full	46	25.3
Fellow	7	3.8
Total	182	100
Years of Experience		
1-5	32	17.6
6-10	48	26.4
11-15	45	24.7
16-20	57	31.3
Total	182	100

Source: Field survey 2015

Table 1 above reveals the age, gender, academic qualification, professional membership and years of experience of the respondents. It was discovered that out of 182 respondents 102 (56%) respondents had over 10 years experience, while 48(26.4%) respondents had between 5-10years experience, only 32(17.6%) respondents had experience less than 6years. Given the above result on experience of the respondents it can be argued that the

information given can be relied upon. Table 1 also gives an idea about professional membership of the respondents, 131(72%) respondents are from associates level of membership to fellow in their different professions. 40 respondents representing 22% were probationer members while 11(6%) have student membership. This further confirms the reliability of the information gathered from these respondents. Table 1 further shows the academic qualification of the respondents, 112 (62.5%) respondents were said to have had second and third degree in their respective discipline. This no doubt reaffirms the reliability of the information used in the paper. It implies that the respondents have the requisite experience, knowledge and are active as far as their professional body is concern.

Table 2. Level of Sustainable property development in Lagos metropolis.

Level of Sustainable property development	Respondents	Percent
Very low	68	43.3
Low	85	54.1
Don't know	4	2.5
High	-	-
Very High	-	-
Total	157	100

Source: Field survey 2015

Table 2 delves into the level of sustainable property development in the study area. Out of 182 respondents only 157 respondents attended to this question. It was discovered that 68 (43.3%) respondents attested to the fact that sustainable property development is very low in the study area. 85(54.1%) respondents confirmed that the level of sustainable property development is low. This result confirmed the findings of Oladokun (2010) where the study affirms that the level of sustainable development is low.

It has been established that the level of sustainable property development is low in Lagos Metropolis. If the level of sustainable property development is low in Lagos State, it is most likely to be non-existing in others state of the country. Therefore, there is the need to investigate the barriers associated to Professional in built environment in the study area. As a result of the low level of sustainable property development in the study area all the variables under consideration were significantly important. However absence of training program was rank highest with a mean difference of 4.23 and a 't' value of 76.81, this was closely followed by lack of credit resource having a mean difference of 4.176 and a t value of 62.22, third on the list is lack of education training in higher institution with a mean difference value of 4.12 and a t value of 64.23. This implies that absence of education on sustainable property development is a major professional barrier to sustainable property development in the study area. Nigeria is alleged to have 17 million housing deficit, with lack of credit resource to ensure a sustainable property development. This probably collaborate the view of Ajayi, (2014) that there are no figure available on building emission in Nigeria the position however is likely to be worse.

Table 3a. *Sustainable property development barriers attributed to Professional in built environment in Lagos metropolis.*

Barriers	Test Value = 0				95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Low client demand	46.193	181	0	3.648	3.49	3.8
Lack of record of the performance of SPD	55.217	177	0	3.955	3.81	4.1
Unproven Technology	52.574	181	0	3.742	3.6	3.88
Absence of training programme	76.814	177	0	4.23	4.12	4.34
Expertise and informationaboutSPD still at modest level	57.769	181	0	3.901	3.77	4.03
Low level of awareness among the construction professionals	51.465	181	0	3.863	3.71	4.01
Lack of expertise's knowledge in green building	53.604	181	0	4.016	3.87	4.16
limited availability of new technology	47.169	181	0	3.912	3.75	4.08
Lack of education training in Higher institution	64.226	178	0	4.123	4	4.25
Poor aesthetic	44.21	181	0	3.385	3.23	3.54
Lack of credit resource	62.221	181	0	4.176	4.04	4.31
Green building phenomena foreign	38.522	181	0	3.456	3.28	3.63

Source: Field survey 2015

Table 3b. *Sustainable property development barriers attributed to Government.*

Barriers	Test Value = 0				95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Lack of Incentive	46.698	181	0	3.813	3.65	3.97
government policy and legislations	98.225	181	0	4.511	4.42	4.6
Lack of Government intervention	69.068	181	0	4.214	4.09	4.33
Absence of training programmes	65.819	181	0	4.093	3.97	4.22
Absence of Certificate and rating agencies	46.607	181	0	3.835	3.67	4

Source: Field survey 2015

Table 3b reveals sustainable property development barriers attributed to the government. It is believed that if government provides an enabling environment the goal of having a sustainable property development may be achieved. From table 3c above government policy and legislations is a major barrier to sustainable property development with a mean difference of 4.51 and a t value of 98.23. There is therefore the need for government to intervene; fortunately the next barrier is lack of government intervention with a mean difference of 4.21 and a t value of 69.07. It is obvious that the government need to intervene in all area of sustainable development but more importantly in policy and legislations.

Table 3c. *Sustainable property development barriers attributed to occupiers in Lagos metropolis.*

Barriers	Test Value = 0				95% Confidence Interval of the Difference	
	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Lack of Awareness	48.55	181	0	3.995	3.83	4.16
Lack of evidence showing benefits of SPD	62.16	181	0	4.022	3.89	4.15
Low level of income	58.844	181	0	4.093	3.96	4.23
sustainable building are expensive	46.204	181	0	3.819	3.66	3.98
Lack of supply of Green buildings	54.567	181	0	3.797	3.66	3.93

Source: Field survey 2015

Table 3c shows the sustainable property development barrier attributed to occupiers. From table 3c it is clear that low level of income with a significant level of .00 and a mean difference value of 4.09 is a major occupier's barrier to sustainable property development. It implies that if sustainable property is provided the occupier may not occupy for low level of income reason. The second reason is lack of evidence to show the benefits of sustainable property development. Well since the level of sustainable property development is low, it may take a while before information on the benefits of sustainable property development can be make public in the study area. MeanwhileO'leary (2008) as earlier pointed out that there is no evidence to demonstrate the benefits of green building to occupiers.

Table 3d. *Sustainable property development barriers attributed to Developers in Lagos metropolis.*

Barriers	Test Value = 0				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
High costs in construction of green building versus low perceived benefits	28.275	47	0	3.563	3.31	3.82
Unwillingness to pay additional cost of construction	24.941	47	0	3.75	3.45	4.05
Lack of awareness	17.825	47	0	3.25	2.88	3.62
Lack of evidence to show the benefits of green building	15.725	47	0	2.75	2.4	3.1
High cost of certifying a building	25.222	47	0	3.875	3.57	4.18
financial consideration	43.192	47	0	4.438	4.23	4.64
cost and logistic involved in importing the required technology	30.506	47	0	4.125	3.85	4.4
belittling social status	19.299	47	0	3.063	2.74	3.38
fragmented construction process	17.301	47	0	2.75	2.43	3.07
insufficient public knowledge	28.521	47	0	3.75	3.49	4.01
Fear of being painted as a radical ecologist	16.592	47	0	2.563	2.25	2.87
limited resale appeal	16.456	47	0	2.75	2.41	3.09
poor aesthesis	14.616	47	0	2.5	2.16	2.84
Lack of credit resourceto cover upfront cost	40.633	47	0	4.125	3.92	4.33
lack of demand and higher final price	23.067	47	0	3.563	3.25	3.87
Absence of certifying and rating agencies	24.959	47	0	3.375	3.1	3.65
split incentives between landlords and tenants	18.713	47	0	2.875	2.57	3.18
Green building phenomena is foreign	23.053	47	0	2.625	2.4	2.85
Length of payback period	26.743	47	0	4.188	3.87	4.5

Source: Field survey 2015

Table 3d reveals the Sustainable property development barriers attributed to Developers in the study area. From table 3d the barrier to sustainable property development from the developer point of view is fund. This further confirms the importance of finance to real estate development. Also the lack of demand hinders the provision of sustainable property development by the developer. It will be risky for any property developer to develop what is not require by the public.

9. Recommendations

Following the discussion of findings in this paper and in order to solve the identified sustainable property development barriers, it is recommended that professionals in the built environment should take course on sustainable property development so as to broaden their knowledge in this aspect of the profession and thereby making themselves relevant in this age that will are in or they handover to the upcoming professionals. Institution of higher learning should also find a way of including sustainable property development in their course curriculum so that their student will not be deficient in this aspect of the profession.

Finance is the bane of real estate development, the government and the financial institution can come up with a special arrange for sustainable property development. Loan for sustainable property development can be low when compared to others form of loans. However the release of such loan must not be one lump sum but a kind of installmental release and physical monitoring of the project before further release of funds. As part of the effort to encourage sustainable property development, certain percentage of life pension can be put aside for those developers willing to embark on sustainable property development for use. Also since it will take a while for pensioners to call for their money a policy can be formulated which will give access to real developer to such fund moreso that the federal mortgage bank of Nigeria cannot cope with the demand of the real estate developer.

10. Conclusion

The low level of sustainable property development in Lagos metropolis is due to financial constraint in the part of the real estate developers, while the professional in the built environment requires more education on sustainable property development and government needs to intervene in area of policy and legislation that affect sustainable property development so that the level of sustainable property development can be improve upon.

References

[1]   Addae-Dapaah, K., Haing, L.K., and Sharon, N.Y. S. (2009) Sustainability of sustainable real property development. *Journal of Sustainable Real Estate Vol. 1No. 1*

[2]   Ajayi, c. A. (2014) Green buildings: a panacea for sustainable property management practice in Nigeria.

[3]   Arnel,T. (2010) Tackling global climate change: meeting local priorities. A world green building council special report retrieved from http://www.worldgbc.org/site2/resources/case-studies/gbc-reports

[4]   Aliagha, G. U., Hashim, M., Sanni, A. O., and Ali, K.N. (2013) Review of green building demand factors for Malaysia Vol. 3, No.11 special issue for international conference on Energy, Environment and Sustainable Economy

[5]   Bond, S., and Perrett,G. (2012) The key drivers and barriers to the sustainable development of commercial property in new Zealand. *Journal of Sustainable Real Estate Vol. 4 No. 1*

[6]   Bala, I. and Ighalo, J. I. (2012) sustainable housing development as a panacea to sustainable environmental management in developing countries. Being paper presented at School of Entrepreneurship and Management Technology, Federal University of Technology, Minna, Niger State , Nigeria

[7]   Businessday (2014) http://businessdayonline.com/2014/06/encourageing-green-bilding-as-standard-for-tomorrows-built-environment/#. U_RCo3lgaJ suggests a number of reasons why green buildings are yet to find favour among developer in Nigeria.

[8]   Buys,Barnelt,Miller and Bailey, 2005)

[9]   Choi, C (2009) Removing market barriers to green development: principles and action projects to promote widespread adoption of green development practice. *Journal of Sustainable Real Estate Vol. 1 No. 1*

[10] Circo, 2008 in Henry, Ross and Harold 2012

[11] Davis, L. (2007) Cost of green revisited: examining the feasibility and cost impact of sustainable design in the light of increase market adoption retrieved from http://www.davilangdon.com/upload/images/publications/USA/

[12] The%20Cost%20of%20Green%20Revisited.pdf

[13] Deloitte, (2014) Sustainable property and real estate. Retrieved   from http://www.deloitte.com/view/en_GB/uk/market-insights/sustainability-service/sustainable-property-and-real-estate/index.htm

[14] Dunbar, D. (2003) Local housing strategy;2004-2009. Falkirk Council Scotland, housing & Social works services

[15] Hankinson, M. and Breytenbach, A. (2012) Barriers that impact on the implementation of sustainable design.

[16] Jain, (2013) Real estate management business process and perspectives New Delhi Discovery Publishing house (DPH) pvt limited.

[17] Klein, J. A., Drucker, A. and Vissier, K (2009) A practical guide to green estate management Chicago: Institute of real estate management of the national Association of Realtors

[18] Kats, G.H. (2003) The costs and financial benefits of green buildings.

[19] Miyatake, Y (1996) Technology development and sustainable construction, journal of management in Engineering12 (4) http://dx.doi.org/10.1061/9ASCE00742-597X(1996)12:4(23)

[20] Oliyide, S.(2014) The evolution of green building in Nigeria. A myth or really: facilities management roundtable with theme "Towards optimal performance of critical infrastructure and real estate assests in Nigeria" organized by Alpha Mead Facilities &Management Services Limited (AMFacilities) as part of activities marking the facilities management day in Lagos.

[21] Oladokun, T. (2010) Sustainable property management practice in Nigeria, paper presented at proceeding of the international conference on sustainability in the built environment.

[22] Parsons, S. (2009) Sustainable property management: Reducing carbon and cost, environmental Leader. Retrieved from http://www.environmentalleader.com/2009/11/12/sustainable-property-management-reducing-carbon-and-cost

[23] Samari M, Godrati N, Esmacilifar R, olfat P and Shafiei M W M (2013) The investigation of the barriers in developing green building in Malaysia modern Applied science Vol7 No. 2 being a publication of Canadian center of science and education

[24] Seyfang, G (2010) community action for sustainable housing building a low carbon future. *Journal of Energy policy Vol 38 Issue 12*

[25] Yung E and Chan E.H.W (2002) Evaluating Environmental Management policies: International trend development of construction management and real estate Zhang X, Platten A, and Liyin S (2011) Green property development practice in China: costs and barriers, *Building and Environment Vol 46 issue 11*.