Adopting Green Building Concepts in Housing Estate Development Projects in Abuja F.C.T., Nigeria: Exploring The Potentialities of End-Users' Preferences

Salisu Gidado DALIBI[a], FENG Jing-chun[b], Abubakar SADIQ[c], Bello SANI BELLO[d]

[a] *Business School of Hohai University Nanjing, Mainland China, salgidos@yahoo.com*
[b] *Business School of Hohai University Nanjing, Mainland China, feng.jingchun@163.com*
[c] *Business School of Hohai University Nanjing, Mainland China, sadiq635@yahoo.co.uk*
[d] *Business School of Hohai University Nanjing, Mainland China, belsann@yahoo.com*

ABSTRACT

Abuja F.C.T. is the Federal Capital Territory of Nigeria; with a population growth rate of about 25% - 45% annually and is projected to reach 10million by 2018. This has led to housing shortages and the need for many housing schemes. Many Residential housing developments do not reflect the desired housing needs of the end-users in terms of satisfaction and sustainability, despite a growing interest in green buildings among the various stake holders. Previous research efforts showed that the results are still uncertain and conflicting. Nonetheless, such studies have exposed the main variables especially the human factors affecting green building projects such as different success criteria, divergent success factors and lack of common or shared perspectives among the stake holders. Incorporating green building features are at the developer's disposal but should align with the potential end-users preferences as it affects the rentals and sales values of such developments. The aim of this paper is to explore the potentialities of using or adopting the End-users' preferences in green building features in estate development projects in Abuja, with a view of adopting green building features that satisfies the interest of both the developers and the end-users thereby promoting green building projects. Review of literatures helps identify and narrow the residential end-users satisfaction in various housing estates and their preferred green features. A 5-point Likert scale questionnaire survey was conducted on Estate Development Firms in Abuja; selected through random sampling method. The results showed that green building features such as: Energy Efficiency systems, Building Envelope, Water efficiency systems, Indoor Environmental Quality and Day-lighting systems were the features favoured by the End-users as they are also adoptable, affordable by the developers. Conclusively, they have the potential of providing a common ground to these stakeholders in adopting green features in residential housing developments in Abuja.

Keywords: *end-users, estate developments, green building management, housing, stake holders, potentialities*

1. INTRODUCTION

Abuja Federal Capital Territory (FCT) is the Capital of Nigeria the most populous African country located in western Africa; geographically located at the centre of Nigeria. Abuja under Köppen climate classification features a tropical wet and dry climate with three weather conditions namely; warm, humid rainy season and a blistering dry season; with a brief interlude of harmattan in between the two (WECSI 2014, demographia.com; Wikipedia.org and Dalibi et al., 2016). A good observation makes Abuja the largest construction site in Nigeria. It is considered among the fastest growing cities in the world, with a present population of about 4million; projected to reach 10million by 2018-20 (Muhammad 2013; Sundaram, 2012; demographia.com; Wikipedia.org). This explosive growth rate has created severe housing problems due to high demand resulting in problems such as overcrowding, inadequate electricity (power) and water supply, other degrading public infra

structure, deplorable urban environment especially the Built environment etc. Despite being a pre-planned city, Abuja is also affected by spontaneous and uncontrolled urbanization like any other city in a developing country and has led to growth of suburban city-like districts and springing up of many satellite towns around the city (Dalibi et al., 2016).

These housing conditions have continued to evoke considerable concern due to its effects on the built environment and also, the need for modern infrastructure that will serve the needs of the present and the future. This goes a long way in affirming the increase in global population growth accompanied by massive resource consumption and its negative impacts on the environment (Dalibi et al., 2016). The combination of these challenges gave birth to a

new concept in design, construction/ renovation, operation and maintenance of buildings in conformity with sustainable practices known as Green Buildings (Dalibi, 2014).

The relocation of various headquarters of Major corporations, banks, companies and businesses further compounded the housing challenges for the end-users with the need for high taste and or high-end housing Estate developments in Abuja FCT; specifically houses with features that add to user comfort ability and save running costs etc. such feature are common in green building projects.

1.1 Research problem

The problems of housing supply in meeting the ever increasing housing demand remains one of the most pressing problems facing Nigerian urban centres (Israel and Basiru, 2008).Although residential quality studies have gained increasing attention in recent times, the majority of such studies was foreign and focused mainly on factors affecting the quality and performance of construction, particularly in public or social housing programs within specific housing environment (Shinnick,1997; Djebarni and Al-Abed,1998, Saari and Tanskanen,2011). A few studies conducted locally have focused on the perception of residential quality in selected neighbour hoods (Ebong, 1983; Ibem, 2012); whereas others addressed the socio-cultural dimensions and patterns of housing quality (Akinola, 1998; Jiboye et al., 2005; Olayiwola et al.,2006; Jiboye 2010).

Over the years, many housing estates were developed by both the Public and the Private sectors or a partnership of both in the Abuja FCT. However, Such Housing estate developments were insufficient in terms of demands; do not reflect the desired housing needs of the end-users; in most cases affordable but not qualitative; do not possess green building features; affected by insufficient electricity (power) and water supply for residential consumption etc. (Dalibi et al., 2016). These outlined the need for housing estate development projects with features that can take into consideration the end-users preferences in such development projects.

Fenn et al., 1997; pointed out that incompatibility of interests amongst stakeholders caused conflicts and disputes in construction. Notwithstanding, Berke (2002) advocated the holistic inclusion of different interests from stakeholders and involving the public in planning. Incorporating the various interests of stakeholders should be extremely important for the preparation of green specifications, construction and maintenance.

Though, green building construction practice is a new trend (about two-three decades old) in construction with insufficient data about the costs and also the absence of measured building performance data from currently operating sustainably designed buildings (BD&C 2003; ENSAR 2003; Andreau et al., 2004). It is evident from some developers' attitudes, as they are not fully inclined towards constructing such projects due to lack of comprehensive data about the financial obligations with regards to Incorporating green features into renovation or proposed projects, Premiums, Marketability, Ratings, Cost of renting, Operating and Recurrent costs, Cost – benefit from envisage energy and water savings etc. (Dalibi et al., 2016).

Morris, 2007; argued that "The most common reasons cited in studies for not incorporating green elements into building designs is the increase in first cost"; the cost of incorporating sustainable designs elements depends on a wide range of factors which includes Building type, Location, Climate, Site conditions and the Project team. These factors may have relatively small or big but noticeable impact on green building developments especially in Abuja and cumulatively, they make a difference.

Sustainable design elements are gradually accepted in the mainstream of project design, in which building owners and tenants are beginning to demand and value those features. It is important to note, however, that advanced or innovative sustainable features can add significantly to the cost of a project and that these must be valued independently to ensure that they are cost and or environmentally effective (ibid). Incorporating green building features/ elements are basically at the developer's disposal and may have a significant impact on the total development cost which in turn affects end-users/ occupants in terms of Rental value, Sales value, Envisaged savings due to green elements, Future asset value of the green building etc. (Dalibi et al., 2016).

Thus, those elements must be checked with potential end-users in order to ensure they meet their housing needs, requirements and also their affordability which will also reflect on the developers' interests in terms of market value and faster sale of the Housing units.

1.2 Research aim

The aim of this paper is to Explore the potentialities of end-users' preferences in adopting green building concepts in housing estate development projects in Abuja F.C.T., Nigeria. Review of literatures in the Eco/ green/ sustainable building field helps identify and narrow few environmentally sustainable passive and active elements in the particular context of Abuja.

1.3 Research hypotheses

The following hypotheses were formulated for this research; T-test statistical tool was used in testing these formulated hypotheses:

Null hypothesis (H_0); End-users preferences does not have any potential impact in adopting green building concepts in housing estate development projects in Abuja F.C.T., Nigeria

Alternative hypothesis (H_A); End-users preferences have potential impact in adopting green building concepts in housing estate development projects in Abuja F.C.T., Nigeria

2. LITERATURE REVIEW

2.1 The significance of stakeholder (end-users) engagement in green buildings (GB)

Stakeholder engagement is increasingly being recognised as more than just a defensive response to criticism or imminent conflicts but rather it contributes to organisational resilience and flexibility, to learning and innovation, to the identification of new opportunities, and ultimately to the improvement of sustainable performance (Partridge et al., 2005).

Any new building construction method or concept has its own peculiar challenges and green building is not an exception. For example, during the 1990s, green building measures were not been widely adopted, (Gottfried, 1996). Too few green building demonstration projects provide the industry with needed "how-to" information that reduces the perceived risk of "pioneering." Moreover, building owners and tenants are often aware of the connection between building-related environmental improvements and increased building economics and value, as well as increased occupant productivity (Ibid).

As such, incorporating the various interests of stakeholders is extremely important in green building projects from the preparation of green design, specifications, to green construction, operation and maintenance. This is done by acquiring all relevant information on green buildings, interpreting this information and effectively disseminating the information to persons who might need or involved in, and influenced by such projects. Communication is so important to project success that it has been referred to as the lifeblood of a project by many practitioners (Awati K., 2010).

The 5th edition of the project Management body of knowledge (PMBOK) published by the project management institute (PMI); outline Project Communications management and project stakeholder management as part the ten core knowledge areas. These two knowledge areas intersect first at the planning phase with one process each, namely; Plan Communications Management and Plan Stakeholder Management. This affirms the need for effective communications among the stake holders to enable success of projects especially green buildings.

Successful delivery of projects, their operations and management (including green building projects) is attributed to many factors of which stakeholders' perceptions, participation, roles and responsibility is among (Bourne, 2005 and Dalibi, 2014). Stakeholders' input, participation, roles and responsibility in Green buildings projects must be of high cognizance than conventional building projects because of the divergent stakeholders' interests (Dalibi et al., 2016). These warrants the need for exploring the potentialities of end-users' preferences in adopting green building concepts in housing estate development projects in Abuja F.C.T., Nigeria.

Several surveys, evaluations and research works were conducted at the post occupancy stages of various buildings to ascertain the level of satisfaction of the end-users and also to rate the intended performance of the buildings. Post Occupancy Evaluations were normally conducted in both residential and commercial buildings,

using various baselines and comparisons. Some studies focus on occupant satisfaction and/ or perception in green buildings (Armitage et al., 2011; Gou et al., 2012a; Wilkinson et al., 2013). Other studies emphasize the differences (if any) in the occupants' satisfaction in and/ or perception of green and conventional buildings (Abbaszadeh et al., 2006; Gou et al., 2012b; Paul and Taylor, 2008; Zalejska-Jonsson, 2012). Still others examine a move from a conventional building/ refurbishment of a conventional building to a green building (Agha-Hossein et al., 2013; Thatcher and Milner, 2012).

Comprehensive building performance evaluation and monitoring is an essential and no longer an optional way to check whether the actual building performance meets the design expectations and also to map the performance issues. It reveals the lessons of 'what works in practice and what doesn't' to be fed back to the construction industry (Bordass and Leaman, 2005 and Bordass 2011).

Occupant surveys are recognized to be a key component of any building performance evaluation study (Stevenson and Rijal, 2008). Recent research shows that different occupant lifestyle and behaviour may result in up to fourteen times difference in energy and water use for the same type of low carbon homes (Pilkington et al., 2011). Also, residents/ end-users provide a valuable source of information about the comfort conditions in a building and their level of satisfaction is an indicator of success or failure of the building performance (Nooraei, 2013)

2.2 Green buildings, end-users' potentialities, preferences and impacts

Green building (GB) sometimes called Green construction/ Eco-building/ High performance building/ Sustainable building is defined based on the features, components and perceived impacts. GB refers to a structure that uses all processes that are environmentally responsible and resource-efficient throughout a building's life-cycle (USEPA, 2009); sensitive to the environment, resource and energy consumption, impact on people, financial impact and the world at large (Greg Kats, 2003); environmentally friendly practices from building design to the landscaping choices by encompassing energy use, water use, storm-water and wastewater re-use (Zane et al, 2009); buildings designed, constructed to provide optimum performance of the building with positive impact to the occupants and the environment by combining energy, water efficiency systems, Day Lighting strategies, Indoor Environmental Quality (IEQ) systems and efficient Building Envelope systems (Dalibi, 2012).

The United States environmental protection agency as cited by Vatalisa et al., 2013; opine that "GBs are designed to reduce the overall impact of the built environment on human health and the natural environment through the goals of sustainable building such as Life cycle assessment (LCA), Energy Efficiency and Renewable Energy, Water Efficiency, Environmentally Preferable Building Materials and Specifications, Waste Reduction, Toxics Reduction, Indoor Air Quality, Smart Growth and Sustainable Development, Environmentally Innovative materials and services. While according to USGBC 2007; "GB is a holistic concept that starts with the understanding that the built environment can have profound effects, both positive and negative, on the natural environment, as well as the people who inhabit buildings every day. Green building is an effort to amplify the positive and mitigate the negative of these effects throughout the entire life cycle of a building".

Thus, the Green building elements and features considered in this work (based on US EPA 2009; Gregg Kats 2003; Zane et al, 2009, Dalibi, 2012; Vatalisa et al., 2013; greenbuildingsolutions.com; USGBC 2007) as cited by Dalibi et al., 2016 are limited to the following:

- Energy efficiency systems,
- Water efficiency systems,
- Day lighting systems,
- Indoor environmental quality (IEQ) systems,
- The building envelope systems.

3. METHODOLOGY

Secondary sources of data such as journals, conference/ seminar/ workshop papers, text books, newspapers, magazines and the internet etc. were used to review literatures in the green building field which helps identify and narrow few environmentally sustainable passive and active elements in the particular context of Abuja, Nigeria. Such GB elements/ features identified and limited in this work include Energy Efficiency systems, Water Efficiency

systems, Day Lighting systems, Indoor Environmental Quality (IEQ) systems and The Building Envelope systems. Moreover, other sub-elements/ sub-features under these systems were also considered; altogether, they formed the Backbone of the research questionnaire.

A random sampling questionnaire survey (as the primary source of data) was conducted to ascertain the end-users' preferences of green building features using a 5-point Likert scale (Highly preferable=5, Preferable=4, Neutral/ Undecided=3, Less Preferable=2, and not preferable at all=1). Frequency count tables, Mean item score and T-test statistics were used for data analyses.

4. PRESENTATION OF DATA AND ANALYSES

The Primary data for this research work was obtained through manually distributed questionnaires from five hundred Occupants/ End-users from twenty different housing estates and Twenty Estate Developing Firms in Abuja, Nigeria. The result collated was arranged and analysed in Table 1-4 below.

4.1 Results from the Administered Questionnaires

The table below shows the responses from the end-users' preferences and Residential estate developers in Abuja obtained from manually distributed.

Questionnaires	End-users		Developers	
	Frequency	*Percentage*	*Frequency*	*Percentage*
Returned & Usable	500	71.43%	20	71.43%
Non-Returned	192	27.43%	8	28.57%
In-complete	8	1.14%	0	0%
Total of Questionnaire Administered	**700**		**28**	

Table 1: The responses obtained from manually distributed questionnaires
Source: Authors' field survey 2016

The table above clearly shows that the total response rate for End-users was 508, out of which 8 were incomplete making the usable number to be 500 or 71.43% which was a very good response rate. Whereas, the response rate of developers was 71.43% which was also very good.

	GREEN BUILDING FEATURES	Mean Item Score for End-users	Mean Item Score for Developers	Remark
1	**Energy Efficiency**			
	Solar panels	4.79	5.00	*Adoptable*
	Wind turbines	3.09	1.00	*Not Adoptable*
	DC Inverters	4.82	4.10	*Adoptable*
	Solar-water-heaters	4.50	3.60	*Adoptable*
2	**Water Efficiency**			
	Grey and Black water systems	2.72	2.35	*Not Adoptable*
	Water saving appliances	4.98	4.80	*Adoptable*
	Rainwater harvest	4.85	4.25	*Adoptable*
3	**Day light**			
	Clerestories	4.16	4.40	*Adoptable*
	Spectral Glazing	3.12	2.90	*Not Adoptable*
	Solar-tubes	4.14	4.70	*Adoptable*
4	**Indoor Environmental Quality**			
	Indoor Air Quality	4.60	4.70	*Adoptable*
	Accoustics	4.73	4.85	*Adoptable*
	Adequate Lighting (Artificial-lighting+Nat Lighting)	4.33	4.50	*Adoptable*
5	**Building Envelope**	3.62	3.00	*can be Adoptable*

Table 2: Preferential responses of end-users and developers in Abuja, Nigeria
Source: Authors' field survey 2016

The result of the various mean item scores for each green building feature as shown above were compared to ascertain the features that can be adoptable in GB development projects based on the 5-point Likert scale used (Highly preferable=5, Preferable=4, Neutral/ Undecided=3, Less Preferable=2, and not preferable at all=1). Any mean item score (weighted average) of 3.00 and above indicates that a green building feature can be adoptable.

4.2 Testing of hypotheses

The hypotheses formulated for this research work was tested using T-test statistics. The values for the mean item scores in Table 3 above were used as the data for the statistical computations as shown in the table below.

STAKE HOLDERS	MEAN	STANDARD DEVIATION	N	D F	Tcal	$Ttab_{0.05,\ 13}$	Decision
1. END-USERS	4.17	0.72	14	13	**6.10**	**-1.77**	**Reject Ho, Accept H_A**
2. DEVELOPERS	3.87	1.17	14	13	**0.199**	**-1.77**	**Reject Ho, Accept H_A**

Table 3: T- test statistical results
Source: Authors', 2016

With 13 degrees of freedom (DF) and 5% level of significance each, the T-test tabulated ($Ttab_{0.05,13}$= -1.77) is less than T-test calculated for both the end-users and the Developers; as such, the Alternative hypothesis was accepted; which states that "End-users preferences have potential impact in adopting green building concepts in housing estate development projects in Abuja F.C.T., Nigeria".

5. CONCLUSIONS

From the limited green building features used in this study (shown in Table 2), it can be observed that both the developers and the End-users Highly preferred, preferred, less preferred and remain neutral on certain green building features in terms of their Preferences and interests in estate development projects in Abuja. This affirms that both shared almost the same preferences regarding the features of green buildings; which is further attested by the T- statistical test by accepting the Alternative hypothesis. The following features as shown in Table 2 above can align the interests of both the stake holders since they were preferred by the end-users and are adoptable by the Developers:

- Solar panels, DC inverters and solar-water-heaters under energy efficiency systems.
- Water saving appliances and rainwater harvest under water efficiency systems
- Clerestories and the use of solar tubes under day-lighting strategies.
- Indoor air quality, acoustics and adequate lighting (artificial lighting + natural lighting) under Indoor environmental quality.
- The end users are in between "neutral/ undecided" and "agree" regarding building envelope whereas, the developers' are "neutral/ undecided". This indicates that building envelope can also be adoptable

6. RECOMMENDATION

Estate Developers in Abuja (including other cities in West Africa, the Whole African continent and the world at large) need to conduct or sponsor a lot of researches frequently on end-users requirements, preferences choices, operability, and additional needs in terms of qualitative or high end housing especially Green buildings. This will expose features that will enhance the market value of the housing estates. Other green building features/ components/ elements should also be considered and researched on, so as to expose many features that may align the interests of both stakeholders.

REFERENCES

[1] Abbaszadeh, S., Zagreus, L., Lehrer, D., Huizenga, C., (2006). Occupant satisfaction with indoor environmental quality in green buildings. Presented at the Proceedings of Healthy Buildings, Lisbon, Vol. 3, pp. 365–370.

[2] Agha-Hossein, M.M., El-Jouzi, S., Elmualim, A.A., Ellis, J., Williams, M., (2013). Post-occupancy studies of an office environment: Energy performance and occupants' satisfaction. Build. Environ. 69, 121–130. doi:http://dx.doi.org/10.1016/j.buildenv.2013.08.003

[3] Akinola, S.R. (1998); The pattern of Housing quality in Osogbo, Osun State,Nigeria. Ife J. Environ. Des. .(ObafemiAwolowo University, Ile-Ife)1–2, 109–120.

[4] Akinyode, B. F & Tareef H.K. (2013). Evaluation of Housing Provision during the last two decades in the context of Nigeria: A case study in Ogbomoso. International Journal of Humanities and Social Science 3(15), 204 - 215.

[5] Armitage, L., Murugan, A., Kato, H., (2011). Green offices in Australia: a user perception survey. J. Corp. Real Estate 13, 169 – 180. doi:http://dx.doi.org/10.1108/14630011111170454

[6] Awati K.(2010): Obstacles to project communication. Available at: < http://www.projectsmart.co.uk/obstacles-to-projectcommunication.html >.

[7] Berke, P.R., (2002): Does sustainable development offer a new direction for planning? Challenges for the twenty-first century? Journal of Planning Literature 17, 21–36.

[8] Bordass, B. (2011): Built environment professionals in the Uk: 40 years back, 40 years on? Keynote lecture in worldSustainable Building (SB) conference, Helsinki.

[9] Bordass, B. and A. Leaman (2005). "Making Feedback and Post-Occupancy Evaluation Routine 1: a Portfolio of Feedback Techniques."Building Research and Information 33(4): 347-352. DOI: 10.1080/09613210500162016

[10] Building Design and Construction (BD&C), editors. (2003). White Paper on Sustainability: A Report on the Green Building Movement. Building Design and Construction (Supplement).

[11] Carmona Andreu, Isabel and Tadj Oreszczyn. (2004). Architects Need Feedback on Environmental Performance. Jul-Aug 2004, Vol. 32 (4). Building Research and Information.

[12] City and County of Swansea research and Information Unit. (2012): A 2011 Census: Release of Initial Results. Cited at: http://www.swansea.gov.uk/media/pdf/e/q/2011_Census_Summary_-_Release_of_Initial_Results_Jul-12_CCS_R_I.pdf

[13] Dalibi, Salisu Gidado, Hadiza Balarabe and Jamilu Bala MaiAuduga (2016); Green Buildings: A Concept aligning the interests of Stakeholders (Developers / Clients and End-users) in Estate Development Projects in Abuja - F.C.T (Federal Capital Territory), Nigeria. SBE16 Hamburg, International Conference on Sustainable Built Environment. 8TH – 11TH March 2016

[14] David A. Gottfried and Lynn N. Simon (1996): Sustainable Building Technical Manual; "Green building design, construction and operations", sponsored by the USEPA and USGBC.

[15] Demographia (2016): Demographia World Urban Areas (Built Up Urban Areas or World Agglomerations) - 12th Annual Edition, April, 2016. Available at: http://www.demographia.com/db-worldua.pdf

[16] Djebarni, R.,Al-Abed, A., (1998). Housing adequacy in Yemen: an investigation into physical quality. Property Manage.16(1), 16–23.

[17] Ebong, M.O. (1983): The perception of residential quality: a case study of Calabar, Nigeria. Third WorldPlann. Rev.5 (3), 273 – 285.

[18] ENSAR Group (2003): Sustainable Federal Facilities Task 2.1 Business Case. November 2002 workshop notes. Boulder, Co.

[19] EUROSTAT (2011): "Consumption of energy" -Statistics Explained .Available at http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Consumption_of_energy

[20] Fenn, P., Lowe, D., Speck, C. (1997): Conflict and dispute in construction. Construction Management and Economic, 15 (6), 513–528. http://dx.doi.org/10.1080/014461997372719

[21] Gou, Z., Lau, S.S.-Y., Chen, F., (2012a). Subjective and Objective Evaluation of the Thermal Environment in a Three-Star Green Office Building in China. Indoor Built Environ. 21, 412– 422. doi:10.1177/1420326X11419311

[22] Gou, Z., Lau, S.S.-Y., Zhang, Z., (2012b). A comparison of indoor environmental satisfaction between two green buildings and a conventional building in China. J. Green Build. 7, 89–104. doi:http://dx.doi.org/10.3992/jgb.7.2.89

[23] Greg Kats (2003): "The cost and financial benefits of green building" – A report to California's Sustainable building task force.

[24] Helen Sundaram (2012): The fastest growing cities in the world: From Quanzhou to Abuja. Available at http://www.wordsearch.co.uk/the-fastest-growing-cities-in-the-world-quanzhou-to-abuja/ Posted / 15.11.2012

[25] Ibem, E.O. (2012); Residents' perception of the quality of public housing in urban areas in Ogun State, Nigeria.Int.J.Qual.Reliab.Manage.29(9),1000–1018
[26] Israel, A. A. & Bashiru, A. R. (2008). Public and Private Developers as Agents in Urban Housing Delivery in Sub-Saharan Africa: the Situation in Lagos state. Humanity and Social Sciences Journal, 3(2), 143-150.
[27] Jiboye, A.D., (2010): Feedback on Public Housing Satisfaction in Nigeria. A Practical Approach for Housing Development. LAP Lambert, Germany.
[28] Jiboye, A.D., Ogunshakin,L.,Okewole,I.A.,(2005);The socio-cultural dimension of housing quality in Osogbo, Nigeria. Int. J. Housing Sci.Appl. Coral GablesUSA29(2),153–164.
[29] K.I. Vatalisa, O. Manoliadisb, G. Charalampidesa, S. Platiasa, S. Savvidisa (2013): Sustainability components affecting decisions for green building projects. International Conference on Applied Economics (ICOAE) 2013. Procedia Economics and Finance 5 (2013) 747 – 756
[30] Katharine Partridge, Charles Jackson, David Wheeler and Asaf Zohar (2005): The Stakeholder Engagement Manual. Volume 1: The Guide to Practitioners' Perspectives on Stakeholder Engagement. By Stakeholder Research Associates Canada Inc.
[31] Katharine Partridge, Charles Jackson, David Wheeler and Asaf Zohar (2005); The Stakeholder Engagement Manual; F r o m W o r d s t o A c t i o n Volume 1: The Guide to Practitioners' Perspectives on Stakeholder Engagement By Stakeholder Research Associates Canada Inc. First Edition July 2005
[32] Lisa Fay Mathiessen and Peter Morris (2004): Costing green: "A comprehensive database and budgeting methodology"
[33] Lynda Bourne (2005): Project relationship management and the stakeholder circle. PhD thesis submitted to Graduate school of business, RMIT University Melbourne, Australia.
[34] Michael Bauer, Peter Mosle, Michael Schwarz (2007). "Green Building: Guide book For Sustainable Architecture".Springer publications.
[35] Nooraei, M; Littlewood, J.R. Evans, N, I. (2013b): Feedback from occupants in 'as designed' low-carbon apartments, a case study in Swansea, UK. Mediterranean Green Energy Forum MGEF-13. Energy Procedia 42 (2013) 446 – 455
[36] Nooraei, M. Littlewood, J, R. Evans, N, I. (2013a): Passive cooling strategies for multi-storey residential buildings in Tehran, Iran and in Swansea, UK. Paper presented at the 4th International Sustainability and Energy in Buildings conference (SEB'12), 3rd to 5th September 2012, Stockholm, Sweden.
[37] Olayiwola, L.M, Adeleye, O., & Ogunshakin, L.(2005); Public Housing Delivery in Nigeria: Problems and Challenges. World Congress on Housing Transforming Housing Environments Through the design, September 27-30, Pretoria South Africa, Vol. XXXIII IAHS.
[38] Olayiwola, L.M.,Adeleye, A.,Jiboye,A.D. (2006); Effect of socio-cultural factors on housing quality in Osogbo, Nigeria.In: International Symposium on Construction in Developing Economies: New issues and challenges. Santiago,Chile.January,18–29
[39] Peter Morris (2007). "What does Green Really Cost?" PREA QUATERLY
[40] Pilkington B, Roach R and Perkins J (2011): Relative benefits of technology and occupant behaviour in moving towards a more energy efficient, sustainable housing paradigm. Energy Policy, Vol. 39, No. 9, pp 4962-4970. Cited at: http://www.sciencedirect.com/science/article/pii/S0301421511004745#
[41] PMBOK® 5th Edition (2012): A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 5th Edition 2012 - 2016. By PMI USA
[42] Saari, A., Tanskanen,H. (2011): Quality level assessment model for senior housing. Property Manage. 29(1),34–49.
[43] Salisu Gidado Dalibi (2012): Cost Impact Assessment of Green Buildings in China (A Case Study of Few Selected Green Building Projects in Shanghai, China). MSc. Thesis submitted to Hohai University Nanjing – Jiangsu Province of China. -unpublished
[44] Salisu Gidado Dalibi (2014): Green Buildings: The Clients' & The End Users' Common Ground in Environmental Sustainability. Nigerian Institute of Quantity Surveyors (NIQS) National Training Workshop; in Uyo, Akwa Ibom State of Nigeria. 9th – 11th October, 2014.
[45] Senator Bala Muhammed (2013); Abuja population will rise to 10m in 2018 – FCT Minister. available at http://nationalmirroronline.net/new/abuja-population-will-rise-to-10m-in-2018-minister/ May 22, 2013
[46] Shinnick, E. (1997): Measuring Irish housing quality. J.Econ.Studies 24 (1/2),95–119.
[47] Stevenson, F. And Rijal, H. (2008): The Sigma Home: towards an authentic evaluation of a prototype building. PLEA 2008 –25th Conference on Passive and Low Energy Architecture, Dublin, 22nd to 24th October 2008.

[48] Thatcher, A., Milner, K., 2012. The impact of a "green" building on employees' physical and psychological wellbeing. Work J. Prev. Assess. Rehabil. 41, 3816–3823. doi:10.3233/WOR- 2012-0683-3816
[49] Todd, S. (2007); Urban Housing Demand, prepared for the new Palgrave Dictionary of Economics. University of Pennsylvania (Wharton) and NBER, Edited version, March 8.
[50] U.S. Environmental Protection Agency. (2009): Green Building Basic Information. at http://www.epa.gov/greenbuilding/pubs/about.htm Retrieved December 10, 2009.
[51] URL: www.greenbuildingsolutions.com
[52] URL: en.wikkipedia.org /wiki/Abuja. "the global encyclopedia"
[53] USGBC (2007): A NATIONAL GREEN BUILDING RESEARCH AGENDA November, 2007.
[54] WECSI (2014); World Engineering Conference on Sustainable Infrastructure, November2014, Abuja-Nigeria. Available at: http://www.wecsi2014.org/About_Abuja.php
[55] Wilkinson, S.J., Kallen, P.V.D., Kuan, L.P., (2013): The Relationship between the Occupation of Residential Green Buildings and Pro- environmental Behavior and Beliefs. J. Sustain. Real Estate 5.
[56] Zalejska-Jonsson, A., (2012). Evaluation of low-energy and conventional residential buildings from occupants' perspective. Build. Environ. 58, 135–144.
[57] Zane Satterfield, P. E(2009); Tech Brief On Green Building, Published By: The National Environmental Services Centre (Winter 2009), Vol. 8, Issue 4 Tech Briefs