THE ROLE OF THE NIGERIAN ARCHITECT IN THE SUSTAINABILITY OF THE COUNTRY'S BUILT ENVIRONMENT: A REVIEW

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Abstract

Globally urbanization is growing rapidly and this change has attained it tipping point in 2007. Nigeria is one of the countries identified to have rapid urbanization growth and its built environment is also changing. Yet the role of the architect in ensuring the sustainability of the built environment is not certain. The study reviews urbanization, the built environment, sustainability and the global concerns for every urban development to be sustainable. Although, urbanization has multifaceted challenging demands, in Nigeria like other developing economies, the rapid growth and the reciprocal developmental demands seem overwhelming. These demands include; the provision of adequate housing, infrastructures, utilities and other services. While these demands depict despair and hopelessness, on the other hand, it is an opportunity for creative responses that ensure sustainable urban built environment. These challenges therefore, present the sustainable urban paradox for the architect. Theoretical findings, suggest that the practices of professionals within the built environment and especially the design creativity of the architect must respond sustainable, in order to ensure a sustainable urban built environment for the present and the future generations. In conclusion, this study has ascertained the important role of the architect towards ensuring a sustainable built environment for Nigeria. Secondly, it has disseminated knowledge on the processes leading to interventions by the architect. Thirdly, the study also recommends the need for collaborative interventions amongst design professionals, with other allied built environment professions and policy makers, in order to ensure implementation of sustainable practices within the Nigerian urban built environment.

Keywords: architecture, built environment, Nigeria, sustainability, urbanization

1. Introduction

Urbanization has been happening globally since the 1800s (Doytsher et al., 2010; Muggah, 2012) and is not likely to stop, resulting into an increasing urban population as shown in Figure 1. Globally, the rural urban shift also changed the urban population from 13% in the 1900s to about 50% by 2010 and the tipping point was reached in 2007 (International Federation of Surveyors (FIG) 2010). It has also been argued that by 2050 this global urbanization shift will increase to 72% (Akunnaya and Adedapo, 2014). Furthermore, rapid urbanization is taking place in many urban centers of the world (Macionis and Parrillo, 2010). Developing countries and Africa is said to be experiencing the highest urbanization growth rate of 3% (Mosha, 2013), while Nigeria is one of the countries identified to be experiencing the highest rate of rapid urbanization (Atere and Akinwale 2006). In Nigeria, the predominant problem associated with its rapid urbanization is the shortage of housing (Ogu and Ogbuozobe, 2011; Allu, 2014), this underpins the study's rationale to uncover the needed sustainable reciprocal interventions for the housing and other infrastructural shortages.
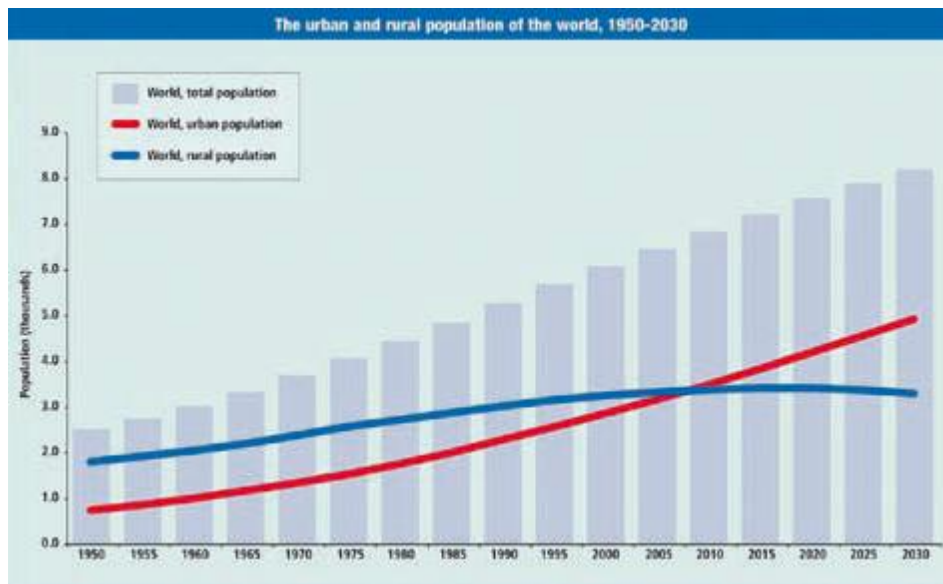

Figure 1: The urban and rural population of the world.
Source: International Federation of Surveyors, FIG (2010 p. 15)

Urbanization is noted to be dynamic and even within the same country and has also been observed to have an uneven pattern. This is particularly so around the built environment of the core city of many urban centers (United Nations Population Fund 2007; Macionis and Parrillo, 2010). In general, urbanization has its positive attributes and it has also posed some challenges.

There are two attributes to the urbanization paradox. Firstly, the positive attributes of urbanization includes; economic diversification and social improvements, however the developmental processes leading to these positive attributes are its challenges (Shen et al., 2015; Ameen et al., 2015). Secondly, the environmental challenges of urbanization include; environmental waste, pollution, overcrowding and the excessive use of natural resource

(Surenran and Sekar, 2010; Shen et al., 2015; Ameen et al., 2015) particularly by the activities in the built environment sector.

Generally, these two main attributes observed in relation to environmental challenges at any local level; the challenges seem to be one of despair and hopelessness and on the other hand an opportunity for creative responses that would ensure a sustainable future at any local level (Mamo, 2007; Mosha 2013). Hence, this study presents some of the urbanization paradoxes relating to the built environment and its sustainability. The study focuses on how the architect can overturn the challenges into creative opportunities through the architectural interventions that would reposition architectural practices within the urban built environment sustainably. However, an earlier inductive study suggested that the application of sustainable architectural options and strategies are uncommon in developing countries (Allu and Ekele, 2015), this mainly due to limited knowledge on the connections between design practices and sustainability of the urban built environment by some architects. This study bridges the gap in knowledge and advances some recommendations.

2. Literature Review

The review section of this study's theoretical discuss is divided into three sub-sections in order to highlights the relationship between the keywords. These sections are presented as follows: urbanization and the built environment, the Nigerian Built environment and sustainability and Sustainability and urbanization. These are further discussed in section three and thereafter, the conclusion is drawn and some recommendations are suggested.

2.1 Urbanization and the built environment

The built environment constitutes all buildings, man-made environments including blue and green spaces where human activities take place (Scotland's Climate Change Adaptation Framework; 2011; Allu, 2015). While urbanization is a developmental process in which an increasing proportion of a population move from rural areas to live in cities and around the cities' suburbs (Bansal et al., 2015). Rapid urbanization is always synonymous with population growth and also with an increased demand on urban infrastructures (Akunnaya and Adedapo, 2014; Cartalis et al., 2016). Consequently, these have led to ever increasing activities in the construction industry of many developing economies like Nigeria (Arif et al., 2009; Mua'azu, 2011). Furthermore, the environmental sustainability is noted to be largely dependent on the activities of the built environment sector (Allu, 2014; 2015). By implication this means that, when the activities in the built environment are practiced sustainably, then the products of these activities would be sustainable.

Other studies have also suggested that, the built environment sector is very important to any policy formulation and evaluation that are connected to strategies aimed at promoting environmental sustainability in any urban setting (Brandon and Lombardi, 2005; Alkadiri et al., 2012; Allu, 2014). This is because the sector's activities have direct impact on the future of the urban built environment.

Achieving sustainable urban development requires sector based initiatives. In this regard, the UN-Habitat (2016) carried out some studies in over 70 urban projects, across different countries in order to identify best practices for any sustainable urban development. Their

findings suggest that all sustainable practices are better strategized through sector based identified initiatives. The built environment sector has also been identified as the sector with the most potential and capacity to promote environmental sustainability globally (Alkadiri et al., 2012; Allu, 2014). Due to this important role of the built environment sector, best practices within the sector are encouraged and rewarded in developed countries (Brandon and Lombardi, 2005; UN-Habitat, 2016).

Similarly another study carried out by Shen et al. (2013) opined that, best practices in the urban built environment are only successful, when all developments are guided by sustainable actions and strategies. The same study by Shen et al. (2013) further suggested that in order to ensure sustainable practices within urban built environment or in responding to the infrastructural demand on our urban centers, three baselines must be established. These three baselines are as follows:

    i.   Establishing the existing practices,
    ii.   The categories of practices and
    iii.   The achieved outcome of best practices within the sector.

In a recent study conducted by Tan et al. (2017), their findings revealed and further validate the early study of Shen et al. (2013), on the need for these baselines. Tan's study also established existing practices within the urban built environment and also categorized these practices into 25 activities, as shown in Table 1. **Architecture and urban design** tops the list as the most important category, because it has the most potential to promote best practices and hence, the most capable to drive the sustainable global agenda. The Nigerian architects therefore, need to ensure that, their practices are sustainable in order to minimise the urban sustainability paradoxes.

Table1 Categories of sustainable urbanization best practices in order of ranking

s/n	Categories of sustainable urbanization best practices
1	Architecture and urban design
2	Children and Youth
3	Civic engagement and cultural vitality
4	Climate change
5	Economic development
6	Environmental management
7	Gender equality and social inclusion
8	Housing
9	Poverty reduction
10	Production and consumption patterns
11	Social services
12	Urban and regional planning
13	Urban governance
14	Land use management
15	Technical and inter-municipal cooperation
16	Community reconstruction

17	Communication and transportation
18	Energy efficiency and renewable energy
19	Education
20	Wastewater treatment
21	Water supply
22	Solid waste management
23	Flood risk management
24	Forest restoration
25	Public health

Source: Tan et al. (2017) without coding tags

Also Roetzel et al. (2017) in their recent study on the sustainability of the urban build environment, the researchers concluded that *"The limitations of previous approaches to sustainability, particularly with respect to the built environment, are that they fail to take a holistic view of the architectural design"*(p. 225*).* Their conclusion further points to the architectural profession as key, and an important factor for achieving urban environmental sustainability.

Consequently, in order to achieve any sustainable best practices, the peculiarities of a locality or country should also be given some contextual considerations (Allu, 2014). This reasoning supports the premise and underpins the contextual choice for this study's context.

2.2 The Nigerian Built environment and sustainability

Environmental challenges for sustainability, particularly within the built environment are global and Nigeria is not an exception. Solutions seeking research are continually being carried out globally and the main strategy lies with sustainable strategies, actions, implementations, policies and environmental laws (Kilbert, 2016; Allu, 2016). Environmental Laws in Nigeria, proceeds the post independent era and the laws were mostly provided to protect the environment. However, reflecting on the globally acclaimed definition of environmental law by UNEP (2012, p.3), there are lapses with definition which states that *"Environmental law is essential for the protection of natural resources and ecosystems and reflects our best hope for the future."* This definition seemly suggests, that the built environment was either not taken into consideration or is simply inferred to in the definition. This seeming omission may have contributed to the noticeable non sustainable practices amongst the built environment practitioners. Perhaps that explains why Larenwaju (2012) describes the Nigerian urban built environment as fast deteriorating. More so, that the principles of the environmental law formulated to guide the activities of the environment have not clearly pointed out the salient role of practices within the built environment.

Ogbonna and Allu (2010) in their study also observed that, the Nigerian environment is largely defined by the activities of the built environment sector. Other later similar studies have also acknowledged that the construction industry in Nigeria continuous to be active (Mua'zu, 2011; Allu, 2014). These opinions on Nigeria by implication means that the professions within the built environment are busy and especially for the architect who is largely the initiator of processes leading to any development in the Nigerian built environment sector. Again, the urban built environment in Nigeria is far from being sustainable. Yet, whilst acknowledging earlier research carried out on the sustainability of the

build environment, a recent research conducted by Roetzel et al. (2017 p. 225) notes that *"The limitations of previous approaches to sustainability, particularly with respect to the built environment, are that they fail to take a holistic view of the architectural design."* Roetzel et al. (2017) statement has therefore; put more emphasis on the role of the architect to be very important for achieving urban sustainability.

2.3 Sustainability and urbanization

A sustainable urban environment is the product of sustainable interventions. On the other hand, the impacts of urbanization pose a great challenge for the urban environment. This inter link has been acknowledged by Cartalis et al. (2016) thus, *"Urbanisation... and environmental impacts is one of the key drivers of change that challenges the sustainability and resilience of urban environments globally"* (Cartalis et al., 2016, p.1). Therefore, the intervention for the urban paradox can only be addressed through integrated sustainable interventions. Other related studies have also support the interrelationship between sustainability and urbanization. In their study, Alan (2009) and Roetzel et al. (2017) concluded that, in order to achieve a balanced urban complex, sustainable knowledge is required and the capacity to apply such knowledge to buildings and other urban infrastructures holistically and the application of such knowledge remains uncertain in the developing many countries (Emuzie, 2013).

The summation from the aforementioned studies is that it is not enough to have the knowledge but it also necessary to have the capacity and ability to apply such knowledge. Additionally, every aspect of providing sustainable urban environment is geared towards equity so that every generation would have an equal allocation to environmental resources (Zia, 2013). As such, every facet of these complex and multifaceted urbanization challenges must be responded to sustainably. Hence, it is clear that the path for achieving sustainable urban development has to be through sustainable best practices by professionals within the built environment sector and particularly for the architectural practice. A recent study by Cheshmehzangi and Deng (2016) on how to optimize the complexities of urbanizations, summed up their argument and added that, the architect need to collaborate with other built environment professionals, in order to promote the architect's responsive design creativity holistically and its effective implementation to the demands of the urbanization.

3. Discussions

3.1 Linking urbanization, sustainability, built environment and the architect's role

In this study, the argument and position of other researchers have been present to highlight the inter-links between urbanization, sustainability and the built environment. The theoretical discourse in the earlier sections also gave highlights on the challenges of urbanization in general and to the architect. Another twist to the urbanization paradox has been deduced to how to promote sustainability in the urban built environment.

Three steps were recognised on how to identify activities that would enhance the processes leading to engaging best practices within the built environment sector. In furtherance to this, the study has also uncovered the categorisation of developmental activities within the built

environment and **Architecture and urban design** was categorised as having the most potential to reposition the architectural practices sustainably in order ensure the sustainability of the built environment.

Furthermore, deducing from the preceded paragraphs, particularly from the findings of Tan et al. (2017), notes that the architect has an important role to play in ensuring the sustainability. This is an indication that the onus of achieving sustainable urbanization is on the architect, through integrating sustainable options in order to reposition the professional practices to respond to the urbanization challenges. By implication the onus of ensuring the sustainability of the Nigerian urban built environment is with the Nigerian architect.

The processes of actualizing sustainable best practices by the architect also been structured. Firstly, the architect needs to be knowledgeable about the principles of global sustainable agenda. Secondly, the architect is required to have the operational capacity to apply sustainable interventions with the acquired knowledge and thirdly, the architect is expected identify best practices within the profession in order to determine what specific holistic sustainable practices are sustainable and peculiar to the Nigerian urban built environment.

Additionally, the statement from Allen (2009) from earlier discussions, also points to the importance of the capacity for interventions. In order words, the architect requires the capacity to intervene or respond to the sustainable urban paradox posed by the urbanization inter-links. A holistic understanding of the complexity is required before an intervention, not just by the architect but by all stakeholders within and outside the built environment.

Furthermore, Cheshmehzangi and Deng (2016) in their study on 'optimizing the complex urban', also noted and concluded that, collaborative strategies promotes the creative design solutions and implementation. Thus, the Nigerian architect needs to take up this challenge and lead the other built environment professionals in the quest to create holistic design initiatives that would advance urban sustainability. Thus, joining and contributing to the global concern for achieving sustainable urbanization.

Summarily, the role of the architect is significant to achieving sustainable urbanization. For the purpose of this study, the role of the architect is examined not just because it is the focus of this study but also to bring to bear the expectations of the architect as the lead and to reposition architectural to align with the global concern for sustainability. Since, the main concerns for sustainability in the urban built environment are for buildings and the urban infrastructures to be developed sustainably, it is therefore, necessary for the architect to be aware that any unstable design consideration would be damaging to the urban environment.

3.2 Conclusion and Recommendations

This study carried out a review on urbanization, the built environment and sustainability. Their interconnectivity, were also established and the theoretical discourse has also suggested that a sector based sustainable interventions are effective and would also help to identify best practices within the sector. Thus, the product of collaborative intervention would promote the sustainability of the Nigerian urban built environment amidst the urbanization complexities. The study has also established that in order to address the complexity of the inter-links created by urbanization, the role of the architect and invariably **urban design** is significant to

achieving sustainable urbanization. Given this premise, the architect is also required to collaborate with other allied professionals within the built environment and other stakeholders in order to have holistically derived urban design interventions.

Recommendations are suggested as follows:

1. That the architect, through The Nigerian Institute of Architects (NIA) and the Architects Registration Council of Nigeria (ARCON) be reposition to ensure sustainable architectural practices through, education, retraining and sensitizing members towards sustainable practices.
2. Sector based initiatives and research are recommended in order to achieve sustainability in the Nigerian urban built environment.
3. Collaborations amongst the built environment professions, other relevant professionals and policy makers are necessary in order to ensure implementation of sustainable practices within the urban built environment.
4. National best practices interventions are necessary in order to understand the Nigerian contextual peculiarities to the urbanization complexities.
5. Identified products of sustainable architectural practices need to be showcased as case studies by researchers and rewarded by the professional institutes and government.
6. Future research using inductive approaches are encouraged to ascertain knowledge and the capacity of architects to apply sustainable interventions.

References

Akadiri, P. O. Chinyio, E. A. and Olomolaiye, P. O. (2012). Design of a Sustainable Building: A Conceptual Framework for Implementing Sustainability in the Building Sector. Buildings, 2 (2), 126-152.

Akunnaya, Pearl Opoko and Adedapo, Oluwatayo (2014). Trends in Urbanisation: Implication for Planning and Low-Income Housing Delivery in Lagos, Nigeria *Architecture Research* 4(1A), 15-26

Allen, A. (2009). Sustainable Cities or Sustainable Urbanisation? Journal of sustainable cities.   [Online] Available: www.ucl.ac.uk/sustainable-cities Accessed 08/02/2017.

Allu, E. L. A. (2014). Climate Change and Buildings in Nigeria: A Search for Mitigation and Adaptation Framework for Residential Design Guide. A PhD Thesis Submitted at De Montfort University, Leicester- UK [Online] Available: https://www.dora.dmu.ac.uk/browse?type=author&value=Allu,%20Evelyn

Allu, Evelyn L. A. (2015). Built Environment Professionals' Perceptions of Sustainable Urban Built Environment and the Way Forward for Nigeria. *Journal of Arts and Sciences*, 8 (8), pp.1-8

Allu, E. L. A. (2016). Environmental Justice and Sustainability: Evaluating the Built Environment Professional Practices in the Nigerian Context. Proceedings of The European

Conferences on Sustainability, Energy, and the Environment, held at The   Waterfront Hotel, Brighton, UK. Thursday, July 7th –Sunday July 10th 2016, 11-20.   [Online]   Available: www.ecsee2016conferenceproceedings

Allu, E. L. A. and Ebohon, O. J. (2015). Assessing the Knowledge and Awareness Level of Built Environment Professionals in Nigeria. International Journal of Contemporary Applied Sciences, 2(5), 77-95

Allu, E. L. A. and Ekele, T. O. (2015). Sustainable Urban Built Environment for Nigeria: A Framework Approach. *International Journal of Contemporary Applied Science* 2(5 [Online] Available: pp. 96-107 www.ijcas.net

Allu, E. L. A. Ebohon, O. J. and Taki, A. H. (2013). Architectural Design: Its Roles on Buildings for Sustainable Development. International Postgraduate Research Conference, IPGRC. 8th – 10th April, Salford-UK. 92-104

Arif, M. Egbu, C. Haleem, A. Ebohon, J. and Khalfan, M. (2009) Green Construction in India: Gaining a Deeper Understanding, *ASCE Journal of Architectural Engineering*, 15 (1), 10-13.

Bansal, N. Shrivastava, V. and Singh, J. (2015). Smart Urbanization – Key to Sustainable Cities. Proceedings **REAL CORP 2015** Tagungsband 5-7 May 2015, Ghent, Belgium. [Online] Available: www.corp.at   Accessed 12/02/2017

Brandon, P.S and Lombardi, P. (2005). Evaluating Sustainable development in the Built Environment. 1-24 [Online] Available: www.thatconstructionsite.com Accessed 09/07/2016

Cartalis, C. (2014). Towards Resilient Cities-A Review of Definitions, Challenges and Prospects. *Advances in Building Energy Research* 8: 259-266.

Cartalis, C. Santamouris, M. Nyktarakis, G. Polydoros, A. and Mavrakou, T. (2016). Assessing the Interlinks between Urbanization, the built Environment and the Thermal Environment in view of Smart and Sustainable Urban Development: A Demonstration Application for Athens. *International Journal Earth Environment Science*   1:107.   doi: http://dx.doi.org/10.15344/ijees/2016/107

Cherenet Mamo, Zegeye (2015). Designing the 'informal': Spatial Design Strategies for the Emerging Urbanization around Water Bodies in Ethiopia. PhD Thesis, Hafen City University, Hamburg. [Online] Available:
  http://edoc.sub.unihamburg.de/hcu/volltexte/2015/249/ Accessed 20/02/2017

Cheshmehzangi, A. and Deng, W. (2016). Optimizing the Complex Urban: The Case of stainability and the Built Environment for the Eco-Cities in China. *Journal of Advanced Management Science, 4(2)127-132.*

Doytsher, Y. Kelly, P. and Khouri, R. (2010). Rapid urbanization and mega cities: The need for spatial information management C. Potsiou, ed. Research study by FIG (48).
www.fig.net/pub/fig2010/papers/ts01b\ts01b_potsiou_doytsher_et_al_4709.pdf
Accessed 23/01/ 2016.

Ebohon, O. J. Taki, A. H. and Allu, E. L. A. (2013). Sustainable Agenda: Challenges of Mitigation and Adaptation in the Nigerian Built Environment, Proceeding of the Architects Registration Council of Nigeria ARCON 6TH Architects Colloquium. 22nd – 25th April, Abuja-Nigeria, 150-17

Falconer, G. and Mitchell, S. (2012). Smart City Framework: A Systematic Process for Enabling Connected Communities [Online] Available:www/web/about/ac79/docs/ps/motn/SmartCityFramework.scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Smart+City+Framework+A+Systematic+Process++Enabling+Smart+++Connected+Communities#2

International Federation of Surveyors (FIG), (2010). Report 48, Rapid Urbanization and Mega Cities: The Need for Spatial Information Management. [Online] Available: www.fig.net Accessed 21/02/2017.

Kibert, C. J. (2016). The Significance of Sustainability to the Built Environment [Online] Available:www.dcp.ufl.edu/sustainability/sustainability-and-the-built environment/thesignificance-of-sustainability-to-the-built-environment/ Accessed 06/07/2016

Larenwaju, A. F. (2012). Urbanization, housing quality and environmental degeneration in Nigeria Journal of Geography and Regional Planning Vol. 5(16), 422-429, December, 2012 Available online at [Online] Available: http://www.academicjournals.org/JGRP Accessed 12/11/2016.

Mu'azu, A. I. (2011). Promoting Energy Use Regulations for a Sustainable Built Environment in Nigeria in Ogunsote, O. O. Arayela, O. Gyoh, L. E. and Ahmed, Z (Eds), Architecture and the Nigerian Development Agenda IV: Sustainable Built Environment. Talos Press, Abuja Nigeria. 284-293.

Muggah, R. (2012). Researching the Urban Dilemma: Urbanization, Poverty and Violence, IDRC, Ottawa

O'Neill, B. C. Ren, X. Jiang, L. Dalton, M. (2012). The effect of urbanization on energy use in India and China in the iPETS model. *Energy Economics*, **34**, [Online] Available: https://staff.ucar.edu/browse/people/2497/articles%3A11759 Accessed 20/02/2017.

Scotland's Climate Change Adaptation Framework (2011) The Built Environment Sector Action Plan [Online] Available: http://www.scotland.gov.uk Accessed 25/01/2013.

Ogu, V. I. and Ogbuozobe, J. E. (2011) Housing Policy in Nigeria: Towards Enablementof Private Housing Development. Habitat Internationals, 25 (4), pp. 473-492.

Surendan, A. and Sekar, C. (2010). An Economic Analysis of Willingness to Pay (WTP) for Conserving the Biodiversity. International Journal of Social Economics, Vol. 37(8), 637-648.

Tan, Y. Xu, H. Jiao, L. J. Ochoa, J. Shen, L. (2017). A Study of Best Practices in Promoting Sustainable Urbanization in China, Journal of Environmental Management 198, 8-18.

UNEP (2012). Advancing Justice, Governance and Law for Environmental Sustainability [Online] Available: www.unep.org/delc/worldcongress/ Accessed 15/01/2016.

UN Habitat report (2014). Cities and Climate Change: Global Report on Human Settlements. United Nations Human Settlement Programme.

Zia, A. (2013). Post-Kyoto Climate Governance: Confronting the Politics of Scale, Ideology and Knowledge. Rutledge Press, London