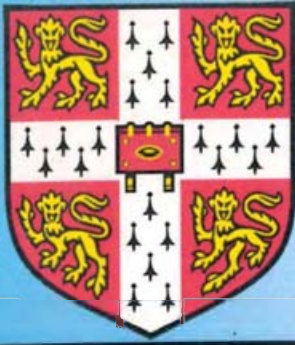


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SOCIAL AND CULTURAL CONSTRUCTION OF HEALTHY CITY IN SUB-SAHARAN AFRICA: A CASE STUDY OF URBAN CONFLICTS AND MODERNISATION AGENDA IN ONDO STATE, NIGERIA



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Abstract

This paper examines the processes of transformation of the architecture and spatial character of a Nigerian city, in the achievement of a healthy and sustainable built environment. Objectives: It investigates the conflicts, tensions and negotiations that take place between those city dwellers embedded in the context of traditions and those pursuing a modernization agenda at a time when new infrastructures (hospitals, food markets and Automobile Markets) are being introduced in Akure. The study demonstrates that in order to understand how the built marketplace is made, unmade and reassembled, it is necessary to know how the worldviews of market users, sellers and policymakers are both culturally and socially constructed. Method Used: Interpretive anthropology and Actor Network Theory are used to explore the unwritten ritual practices, persistent traditional values, conflicts and socio-cultural transformations that underlie the physical built environment in which the health and social facilities are located. Findings: The research shows that the character of the built environment and social infrastructures within the city is not simply an outcome of rational decision making, but is driven by the cultural preferences and diverging social interests of 'actants' as they negotiate the process of change between tradition and modernity and make choices.

Keywords: Actor network theory, anthropology, culture, modernity, built environment, liveable city

INTRODUCTION

The urban renewal efforts of the government focused on the remaking of infrastructures that comprise of proving new hospital buildings and the remodelling of the outward appearance of traditional markets as compared to the newly built or proposed market structures and arrangements. In the eyes of government elites the

pursuing the redevelopment of Akure's markets and precincts of the urban core , are evident in statements that they have provided on their own from the official website of the Ondo state government¹ (see extracts in Box 1). It is clearly a propaganda move by the government to feature reports that favours their views or promotes their activities, using it to herald their developmental projects in the state, an indication of the underlying conflict in the redevelopment of the built environment in Ondo State's capital.

Struggle to Reconcile Western Influences with Indigenous Ethno-Cultural Influences in Relation to Food, Health and the Changing Nature of the City

In the same vein, the statement in Box 1, assumes that market traders, (dismissing their reservations about the new markets as unfounded) and claiming that traders have and will appreciate these more modern, 'ordered environments'. The account is presented in the usual middle class vision of environment devoid of 'eyesore' and slum like structure and the zeal to provide infrastructural amenities that only serve their lifestyle such as vehicular parking lot, crèche in a market, bigger roads and beautiful high-rise market structures that alienates the poor market women or men and the urban poor.

¹ Available at: www.ondostate.gov.ng/press_release/In%20Ondo%20State.pdf. This article are from the official site of the current Ondo state government of Governor Mimiko and articles are comments of reporters and journalist featured on this portal tend to sympathise with the views of the government and then incumbent Labour party.

traditional market is little better than a 'slum', and the middle class, it seems are largely in sympathy with this view. This group of actants use terms and phrases like, 'dirty', 'disordered', 'untidy', 'filthy', 'not presentable' and 'not up to standard', to describe the city and state's traditional markets as they presently exist. The new modern markets, in contrast, they identify with progress, using terms like 'modern', 'ultra-modern', 'orderly' and 'of international standard'. This approach generated conflict and tension around the redevelopment of major cities of Ondo state.

METHODOLOGICAL AND THEORETICAL APPROACHES

The delineation of an 'analytical range of study' requires the drawing of artificial boundaries discovered in a continuous search for realities within the 'confused overlap' of networks and endless translation and negotiation that happens both human and non-human actants. In other words, we can say that the "settlement of an actor network is not defined *a priori*", but emerges from the complex, open set of relations and from the characteristics of the elements that are part of the actor network" (Cordella and Shaikh, 2006:11; Latour, 1996a and b). There are precedents for combining ANT with anthropological perspectives in research. Hitchings' (2003) and Callon's (1999) approach is of particular interest to this study. Initially, to better place the analysis of the market network within a definable context, following their approach, I have grouped actants into related networks operating within spatial and institutional settings at different scales. At one level are, (A) urban core users such as market traders, including market associations and leadership, market users or buyers and (B) policy makers and politicians and (C) professionals associated with the built environment all of whom operate within the spatial and institutional boundaries of the urbanity.

DISCUSSIONS OF RESEARCH FINDINGS

For instance, the traditional market is situated at the centre of the city near the ancient palace of the king or paramount ruler (Deji of Akure) and ancient quarters. This is different from Onyearugbulem Market that is located at the Akure city outskirts. This relatively new market was originally intended to replace Akure's traditional central market and then had its use changed to a car sales and wholesale electrical part market because the trader refused to move/ relocate. Also Arakale and NEPA neighbourhood markets are additional market structures built by Governor Mimiko administration in between 2010 and 2012 to replace demolished old markets located on these sites. The Ondo State Government's aesthetic motivations and modernisation agenda, in

Box 1: Governor Mimiko Spearheads Urban Renewal in Ondo State

At the entry point of Arakale from Hospital Road is the NEPA Caring Heart Neighbourhood Market, an ongoing project to create a modern market complete with all the needed amenities, out of a slum, while, as you exit Arakale Road to Ondo Road, is the Isinkan Caring Heart Neighbourhood Market. In the neighbourhood markets scattered across the state, it is a case of 'shopping made easy' as attested to by the market men and women. Amenities in the Isinkan Caring Heart Market include police post, clinic, abattoir, 12 toilets, fire service and a crèche for people that need day-care services for their babies. Before the advent of the Governor, the markets in Akure, just like in other major towns of the state, were at best, slums. But the coming of Mimiko [the Governor] has brought a new lease of life to shopping across the state. The Neighbourhood Market located within Akure, I learnt, was completed within three months of Governor Olusegun Mimiko's assumption of office. I chatted with the people in the market to feel the pulse of the market people. I can tell you that they are happy with the Governor. The market women told me that the market, as modern and neat as it is cheap and secure to do business in. It has all the amenities any market of international standard should have. As observed by Usman, the former Ondo State military administrator, this is a product of good thinking and the vision came as a small part of Mimiko's larger urban renewal package. But the Akure Automart came with an irony. When the Governor envisioned the facility and informed the Akure auto marketers that they had to move from the road sides where they were displaying their wares (particularly Oba Adesida Road) in order to recreate the place, the initiative was met with strong resistance. The auto marketers did not want to move because of the fear that the movement would lead to poor patronage

Source: SharpedgeNews in Ondo State Portal (2012)

Therefore, the character of the built environment and social infrastructures within the city is not simply an outcome of rational decision making, but is driven by the cultural preferences and diverging social interests of 'actants' as they negotiate the process of change between tradition and modernity and make choices. However, it is important to contrast the statements of professionals, the middle class and political elites with what traders and ordinary market users themselves actually say. In reality, market traders and poorer buyers, are far less concerned with the outward appearance of markets and much more interested in issues of affordability, autonomy, convenience, accessibility and the endurance of traditional values and practices. The information in figures 1 and 2, on the respondent's views for safety of distributed food in Akure, demonstrates the level of concern exhibited by the respondents during the survey conducted on the safety (appearance and being safe for consumption) of food items found in the local

markets in Akure (especially Oja Oba). For example, in figure 1 the respondents show huge concerns for the safety of meat and fish:

I can see that today's market consists of traders who are out to exploit buyers. This is a complete departure from the past ones. Besides, articles (foodstuffs) that are sold in today's markets are adulterated, fake; contaminated or preserve with harmful chemicals. This was not so in the past (Respondent 47, Yoruba, Age: 31-50, Income range: 150,001- 200,000teacher).

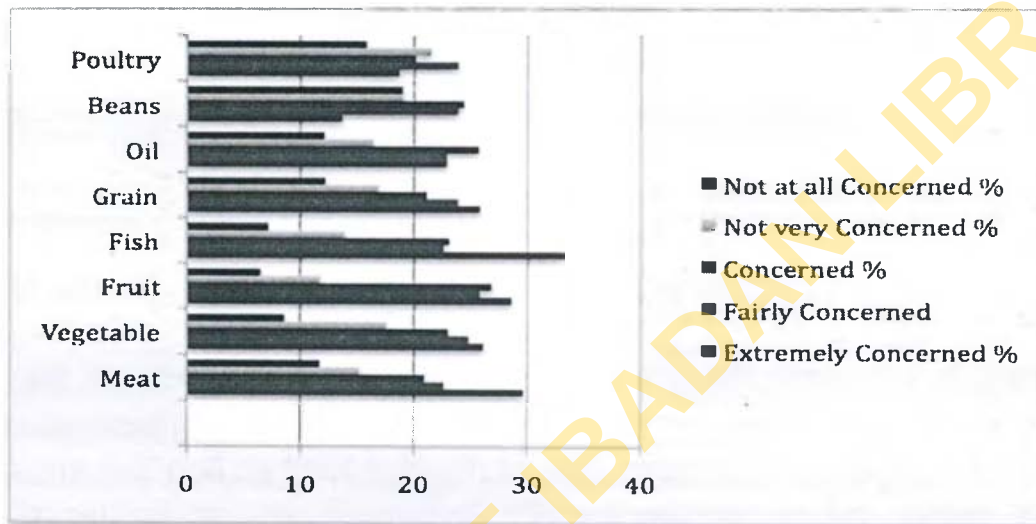


Figure 1: Overall summary of respondents' concern for food safety (contamination) in the markets in Akure

Table 1: Middle Class preferences among the respondents' concern for food safety (contamination) in the markets in Akure²

	Poultry	Beans	Oil	Grain	Fish	Fruit	Vegetabl e	Meat
	Freq	Freq	Freq	Freq	Freq	Freq	Freq	Freq
Extremely Concern	88 (44.4%)	46 (23.4%)	54 (27.4%)	59 (29.8%)	107 (54.0%)	93 (47.0%)	84 (42.5%)	115 (58.1%)

² 198 (65.6%) out of total 303 respondents for the purpose of classification are middle class using correlation of markers of class identity (income, profession and education)

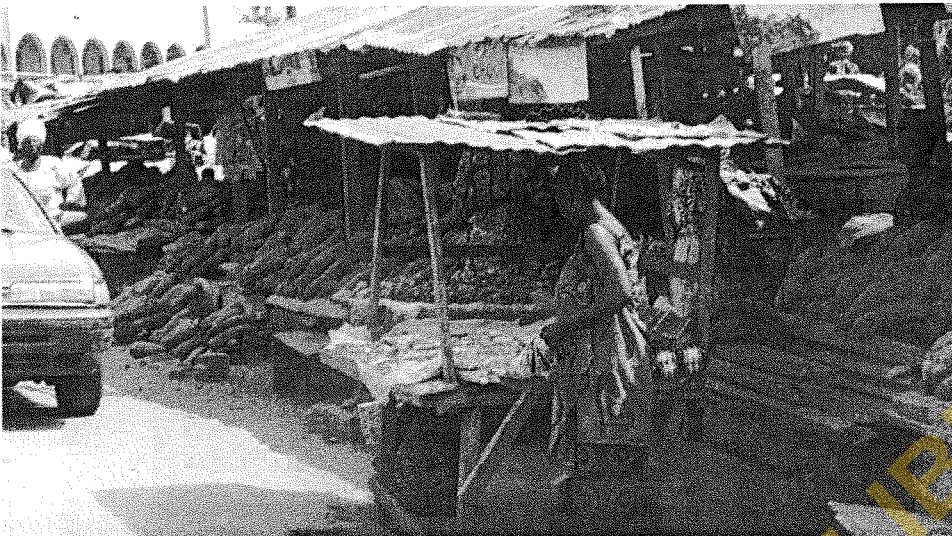


Figure 2: Typical open stall arrangements in Akure's traditional market. Source: Researcher

As part of the urban renewal drive of the current government, major markets in Akure city will be rebuilt or remodelled. It is necessary to point out that a number of construction works are ongoing in Akure's marketplace, and some were already completed. It is not only the central or main market (Oja Oba) that is the focus of the politicians. They also include the new three-storey building within Akure's traditional central market (main market Oja Oba) and the smaller neighbourhood markets, namely Isinkan market, Oshodi Market, Isolo market, Nepa junction market (figure 3), Arakale market (figure 4) and Onyearugbulem market. The government in Akure Ondo state decided to rename these smaller markets as 'Caring Heart Neighbourhood Markets' as referred to in the article in box 1. Onyearugbulem market near Shagari Estate in Akure was eventually later turned into a place for selling spare car parts, because it was built on the outskirts of the city and the refusal of the market sellers to relocate from the traditional Oja Oba (or Erekesan/ central market).

Fairly Concern	19 (9.7%)	10 (5.0%)	30 (15.2%)	24 (12.1%)	22 (11.3%)	30 (15.2%)	27 (13.6%)	16 (8.1%)
Concern	19 (9.7%)	49 (25.0%)	26 (12.9%)	27 (13.7%)	27 (13.7%)	30 (15.2%)	37 (18.7%)	27 (13.7%)
Not very Concern	26 (12.9%)	30 (15.1%)	32 (16.2%)	34 (16.9%)	8 (4.0%)	8 (4.0%)	8 (4.0%)	11 (5.6%)
Not at all Concern	11 (5.6%)	18 (8.9%)	27 (13.6%)	19 (9.7%)	8 (4.0%)	8 (4.0%)	10 (5.0%)	3 (1.6%)
Blank	35 (17.7%)	45 (22.6%)	29 (14.7%)	35 (17.7%)	26 (12.9%)	29 (14.7%)	32 (16.2%)	26 (12.9%)
Total	198	198	198	198	198	198	198	198

Actors Negotiating Contradictory and Challenging Situations in the Urban Context

Such views, as expressed above, are an indication of conflicts between the local market sellers who sees nothing wrong in their environment regarding them as natural. As compared to the educated shoppers, who on the other hand are delighted to visit the traditional markets but do not like the dirt. This study does not suggest that an unhygienic environment is a virtue, but as the proverbial statement goes, “it is not wise to throw bad water and the baby away”. Many a time, in resolving situations like these, it requires a careful balance to avoid making measures that go to the extremes. Such extreme measures can be seen in Akure in the case of the government’s decision to replace the traditional main market with a three story ‘sanitized’ structure. This is done in order to mitigate the dirty “unhygienic” environments.

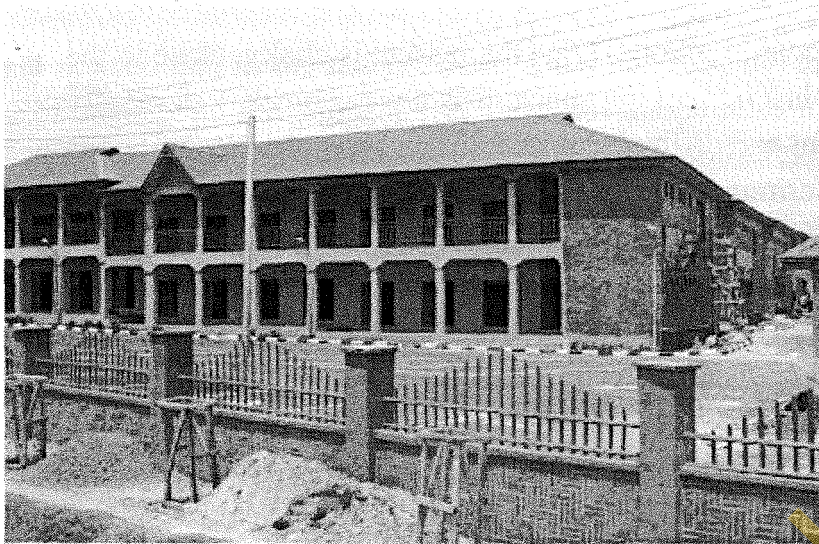


Figure 4: New Neighbourhood Market along Arakale Road, Akure. Source: Dada (2012), available at: <http://myondostate.com/w3/aregbesola-to-copy-mimiko-vows-to-build-international-market-with-770-open-stalls-392-lock-up-shop/>

Interviews conducted during the field survey demonstrate that many middle-class respondents do strongly support the view that this ‘modern’⁵ on-going construction in Akure marketplace is desirable, a sign of progress:

The government should subsidize market lock up shop rents. The rent cost when compared to the structuring of the spaces is good. Also the easy availability of parking spaces for vehicle in the neighbourhood market is encouraging. (Respondent 153, Yoruba; Male; Age: 31-50; Grad Stud Architect; University Educ; Income range: N100, 001-150,000 per month)

There are no drainage and parking spaces in the old Oja Oba market, it always look messed up each time you go especially in wet season- Human traffic in the Oja Oba market caused by non shop owners - Shanty structures causes nuisance, this is absent in the modern market structure of the current Mimiko government (Respondent 183; Yoruba, Male; Age range: 19-30; Environmental Planner, University Educ; Income range: N100, 001-150,000 per month)

⁵ The urban renewal projects especially the reconstruction of the markets in Akure and other major towns in Ondo state (Ondo town, Ikare) is viewed by the government as modern intervention and one of the key projects in their drive towards healthy and sustainable environment.



Figure 3: View of the new Nepa neighbourhood market structure where many traders and shoppers feel like the proverbial 'fish out of water'. Source: Researcher

The traditional arrangement of stalls in the Oja-Oba market is quite informal, primarily taking the form of groups of open tables or simple wooden sheds with corrugated iron roofing (see figures 3). A new set of lock-up shops with open stall on the ground floor was provided by the local government authority in 2005 in conjunction with the then state government³ (see figures 4) to garri⁴ sellers, another set to meat, rice, vegetable, fish and chicken/turkey sellers and another set to the provision traders, i.e. sellers of milk and other processed food drinks and rice.

³ These lock up shops are to be demolished by the current government of Governor Mimiko to make way for the proposed new market (see figure 4 below).

⁴ Garri is the local name of processed Cassava tuber when transformed into a dry powdery foodstuff. It is popular among the Yoruba.

I noticed that in the market there is the presence of stores instead of stalls. The government feel they can make more money from the stores rather than the stalls. This is rather unfortunate since the need of the market sellers are compromised on the platter of economic gains rather than what they really need to make their selling experience more ideal. (Respondent 115; Yoruba, Student, Age range: 19-30, University, Income: 10,001-25,000 per month)

The market has really changed now compare to the past” I don’t really like the change for instance the turning of the market as we know it from an open space into ‘lock up’ shops and concrete stalls is making foodstuff very expensive and it is impacting adversely on us low paid workers (Respondent 100; Yoruba, Male; Transporter Assistant, Age range: 19-30, Secondary, Income: 10,001-25,000 per month)

As already mentioned, the government has put forward a proposal (see figure 5) for an entirely new complex of three-storey buildings to be built within the Oja-Oba market. In some ways this can be seen as a victory for traders and ordinary market users, in that it demonstrates that the authorities have finally abandoned the idea of relocating the market. However, the proposed design equally betrays a fixation with surface appearances. The proposal is hailed as ‘modern’ and progressive’ by its advocates, but it does not reflect the preferences of traders in terms of basic considerations like accessibility and affordability. It is also seen as a contributing to the erosion of market traditions by shoppers and traders who still identify the traditional market space as an essential part of the character and cultural life of Akure city.

The present (central market) Oja Oba market is choky, close to the main road. It has no parking space. It is always block – especially the access road and difficult for pedestrians to walk. Sale of goods is done indiscriminately. Open shelving and hawking of goods. These problems are absent in the new market built by the new government, thank you Governor. (Respondent 196; Yoruba; Male; Age range: above 60; Retired Civil Servant & Farmer, University Educ; Income: N100, 001 – 150,000 per month)

In terms of hygiene markets have changed for good in the past one year in Oja Oba. They are neater, especially through the effort of the present government in their urban renewal effort. We need more space to park our car during shopping at (central market) Oja Oba. (Respondent 250 Yoruba, Female; Civil Servant, Age range: 31-50, University, Income: N150, 001 – 200,000 per month)

While middle class shoppers may see the modernisation of the market as desirable, many of the traders and working class people, for whom the stalls were intended, see things differently. Conversely, the following quotations from the survey provide criticising of the new lock-up shops and stalls that the middle class found desirable:

The new market structure and stalls provided by the current government in Akure is beyond our reach as average market seller...generally present market stalls are decent (Respondent 49, Yoruba, Female; Age: 31-50, trader, Illiterate; Income: N0- 10,000 per month)

Nowadays the local government is taking steps to remove hawking from the streets and roadside marketers...are being gradually driven away. How do they want those people to eat and fend for their families? The government should concentrate on providing jobs for the youths that are unemployed instead of constructing 'fanciful market structures', car parks for the rich and bus stops that we don't use. (Respondent 72; Yoruba, Female; Age range: 19-30; Petty Trader, Secondary Educ, Income: 10,001-25,000 per month)

vital organ necessary for the sustenance of the lifeworlds of the city's many inhabitants.

Box 2:

Interview Extracts on the Reconstruction of the Urban Core Area of Akure

There is even another strange belief that the moment you are making the market more 'shoppy', the more expensive the food items being sold in such a market. That is why NEPA market (NEPA market is another market, located in the core zone of Akure, demolished and rebuilt into a neighbourhood market by the current Governor Mimiko administration) is one of the most expensive markets in Akure. Nobody goes there, it is only the 'pepper yo yo' [means a local girl that is behaving like a 'been to'; been to abroad] that goes there. You don't get this 'open market thing', the way it is in 'Oja Oba'. From when we are small - NEPA market is like ... for those pepper yo yo's.

Source: Researchers' Interview Extract, Odeyale, (2012)

In sum, there will always be conflict when government elites make decisions and take action based only on the tastes and desires they hold in common with the middle class. It is apparent that what is aesthetically acceptable to this alliance of actants runs contrary to what is wanted and needed by ordinary market users and traders. These elites fail to appreciate that much of what constitutes 'chaos' in their eyes, is a consequence of autonomy of action and spontaneity in market activity that most traders and many market users wish to maintain. They also fail to appreciate how long-standing traditions underlie seemingly chaotic arrangements in the marketplace and the extent to which this is still valued by other actants in the market network.

Another example of the authorities' preoccupation with the aesthetics of the traditional market and surface appearances can be seen in the way they attempted to resolve problems of waste disposal in Oja Oba. Typically, the middle class also express a dislike for the traditional market because of what they perceive as its 'dirty' appearance.

- The place is crowded and somehow dirty... (Respondent 52; Yoruba; Male; Civil Servant; Age range: 31-50, Polytechnic, Income: N100, 001-150,000)

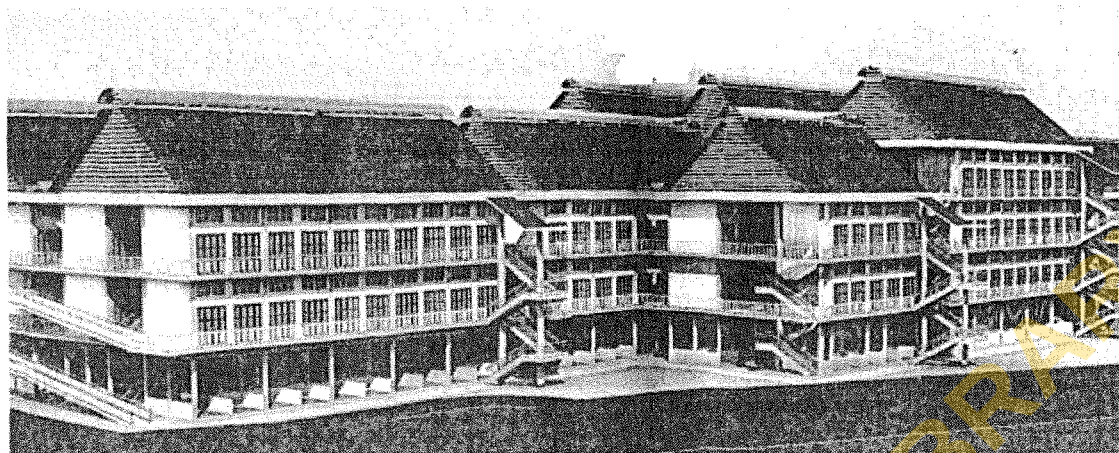


Figure 5: Proposed New Akure Main Market (Oja Oba Market). Source: Modern Habitat Design Group Akure, 2011.

Box 2 below highlights the views of one of the respondents, a working class woman (trader)⁶, who typically rejects the official interpretation of the push for market modernisation in general, presenting it a middle-class preoccupation and as an anathema to both traders and ordinary market users (see Box 2). Here modernisation is condemned not only because it is seen as unaffordable and impractical, but also because of the way it erodes traditional, informal arrangements necessary to the social and cultural life of the city.

The traditional market welcomes everybody; it does not discriminate, in the sense that traders can come and spread their goods out for sale with 'no strings attached'. And it is not just the selling that is important; the nature of social interaction that takes place in the traditional market is a vital part of the daily lives of countless ordinary people, particularly the old. Many older people, traders and shoppers alike, have been coming to the Oja-Oba market all their whole lives, and are used to and expect to engage in the customary practices of the traditional marketplace. For many people, going to the market is not just about buying and selling. What also attracts them is the rapport that exists between shoppers and traders and the atmosphere that is part and parcel of traditional markets. Social relationships are forged, developed and maintained. In this sense a visit to the market is more akin to attending 'social club'. Hence demolishing the market or redeveloping it without reference to customary practices potentially destroys a significant aspect of the social and cultural life of Akure city, eradicating a

⁶ The speaker here (Mrs Olowo) owns a stall at the central market (traditional market Oja Oba) and her statement is an example of the ordinary traders/ working class views that suggest alternative voice on the market restructuring in Akure.

CONCLUSION

It defies belief that they thought a 'quick fix' like this could resolve such a long-standing and deep-seated problem. Of course, the sculptural edifice did not discourage traders from dumping refuse in this location. The outcome was that the market now had a refuse dump with a non-functioning water feature. Again, this is an instance where policy makers made decisions that prioritised the superficial preferences of elites and the middle class, without giving due consideration to practices prevailing in the market and the preferences of less powerful actants, ordinary market sellers, with the result that choices intended to result in greater efficiency actually resulted in greater chaos. In the end, it was the market traders themselves who solved the problem. The Market Sellers' Association negotiated an agreement between their own members and the authorities, whereby traders would participate in a regular 'sanitation day', where they would spend a few hours collecting rubbish and cleaning.

REFERENCES

- Akinro, A. O., Ikumawoyi, O. B Olotu Yahaya & Ologunagba M.M. (2012) Environmental Impacts of Polyethylene Generation and Disposal in Akure City. Nigeria Global Journal of Science Frontier Research, Agriculture & Biology, 12 (3): 2-8.
- Cordella, A and Shaikh, M. (2006) 'From Epistemology to Ontology: Challenging the Constructed "truth" of ANT'. *Working Paper Series*, p. 9 [Online]. Available at: <http://is2.lse.ac.uk/wp/pdf/wp143.pdf>
- Callon, Michel (1999) 'Actor-Network Theory - The Market Test.' In: J. Law and J. Hassard (ed.) *Actor Network Theory and After*. Oxford: Oxford University Press.
- Hitchings, Russell (2003) 'People, Plants and Performance: On Actor Network Theory and the Material Pleasures of the Private Garden', *Social & Cultural Geography*, 4(1) 99-114.
- Latour, Bruno (1996a) *Aramis, or The Love of Technology* (trans. Catherine Porter). Cambridge, MA: Harvard University Press.
- Latour, Bruno (1996b) 'On Actor-Network Theory: A Few Clarifications', *Soziale Welt* 47: 369-81.
- Odeyale, T.O., F.K Omole, B. Sodagar, N. Temple and C. O'coill (2012) "Traditional Foodmarkets, Power Relations and Waste Management: a Qualitative Study. In V. Popov, H. Itoh and C.A. Brebbia (Eds.) *Waste Management and the Environment VI, WIT Transaction on Ecology and the Environment*, Vol. 163, pp. 37-47. (ISSN 1743-3541).

There is a lot of filthy and inadequate parking space (Respondent 71, Yoruba, Age: 19- 30; Income range: Banker.N100, 000-150,000)

I don't like attitude to sanitation...there is poor sanitation evident everywhere in the market (Respondent 96, Yoruba, Male; Age range: 19-30; Architect; University Educ; Income: N100, 001-150,000)

Market traders were dumping their waste on open ground in a part of the market near the main entrance to Oja Oba. In point of fact, traders had little other option but to dump their refuse in this spot because municipal and informal arrangements for waste disposal were wholly inadequate.

Table 2: Types of Waste Disposal Arrangement identified in the Study

	<i>Frequency</i>	<i>Percent %</i>
Thrown away (into bush)	65	22.3
Public disposal	102	34.9
Private disposal (behind the house)	36	12.3
Fed to animals	40	13.7
Open Pit	35	12.0
Refuse mountain	13	4.8
I don't know	12	.3
Total	303	100.0

Pre-existing municipal and informal arrangements for waste collection, like in Akure is appalling; refuse waste from the market and even homes are dumped into the drainages, open pit, refuse mountain and drums or metal bins in front or back of the house which are later sun dried and burnt (Table 2). In later development Ondo state waste disposal board was established in 1999 introduced large trucks, pay loader utility vehicles and skips in the collection of waste in Akure (Akinro et al, 2012). One big skip was placed at the entrance into the central market by Ondo state waste disposal board for the use of the market sellers. Initially, rather than attempting to address the root cause of this problem in the failure of systems of waste management, the authorities decided to use the location of the refuse dump as a site for a sculptural waterfall.

designs in the non-residential sector. Most architecture is designed not to be changed, yet buildings changed in use and will adapt over a period of time. However, the motivation behind this paper is not to consider the technical or physical aspects of building alone, but to examine the actions of men and women (designers) who are behind the active shaping of technology and building system (see fig. 1). Also to examine the motivations, what influences the designer exercise in their interactions and decision making processes in the development of adaptable building solutions. The concept of adaptability in building is a response to the changing needs of rapidly evolving society (Ball, 2002). Adaptable buildings have the in-built ability to adjust to changing circumstances and technologies, without excessive waste and conflict (Kendall & Teicher, 2000). The term 'adaptable' refers to a building's ability 'to be modified or extended at minimum cost to suit the changing needs of the occupants' (DCP, 2005). Habraken (2008) described adaptability as 'loosening grip on fixed functionality' of a building. Hence, adaptable buildings are designed to be extended, reduced, internally rearranged, functionally changed, dismantled or relocated during their lifetime in order to satisfy changing aesthetic, functional or technical demands (Douglas, 2006, Kronenburg, 2002).

The ultimate objective of the adaptable building system is to provide a convergence of designs of a number of different building types with similar spatial requirements such as offices, apartment, hotels in one structure (Gibb et al, 2007). Leading to flexible and multiple uses of building i.e. buildings which can readily change between uses and easily adapted for different uses to support multi-functional use (Beadle et al, 2008).

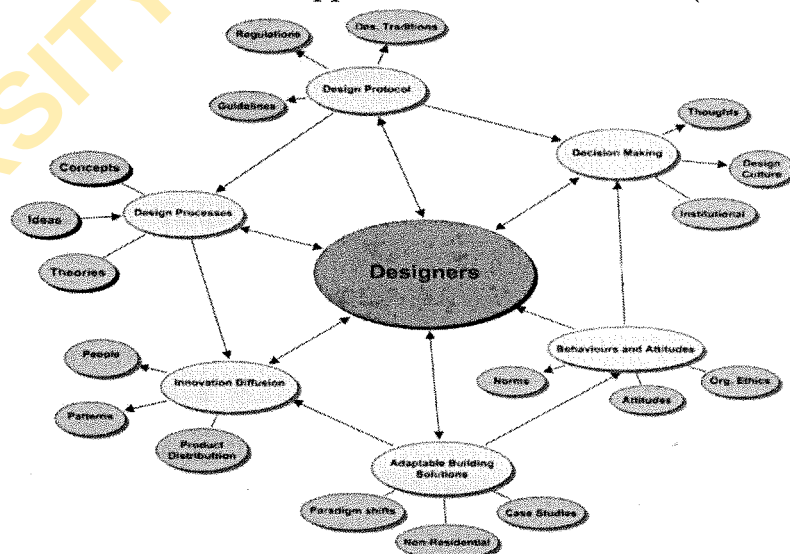


Fig 1.Designers Network for Sustainable and Adaptable Built Environment

ARCHITECTS' ROLE IN THE SHAPING OF INNOVATIVE ADAPTABLE BUILDINGS IN A SUSTAINABLE BUILT ENVIRONMENT



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Abstract

The drive of every sociological study is to explore the changes that are taking place in society and what direction these transformations will take in the future. It must be noted that construction and technological issues demands a sociological explanation, hence the thrust of the study. The research is aimed at opening up new perspectives on the behaviour of architects and the workings of its social institutions. To discover general social pattern that emerges from individual or group actions and interactions of designers; which underpins new technological adoption. The research methods employed include examination of practised based case studies and interview in the adoption of innovative adaptable technologies in shaping a sustainable future for the built environment. Review of literatures carried out affirm the necessity for further investigations into the underlying socio-cultural dimensions at play in the formation of sustainable built environment in Sub Saharan Africa which include the prevailing local cultures. The paper conclude that adequate decision support mechanism and information is imperative to aid architects, designers, built environment practitioners and policy makers alike.

Keywords: adaptable environment, design process, innovation, sociology, sustainability,

INTRODUCTION

The understanding of what buildings were; how they came to be and why they are the way they were, is paramount to the understanding of building adaptation and evolution (Kostof, 1991; Fletcher, 1996). The concept of building adaptability entails having buildings with the attributes of flexibility, scalability, extendibility, sustainability^o and refitability, which has enormous benefits to the client, the industry and society. However, there is little design guidance for supporting the adaptable building design process especially in Sub-Saharan African countries. This paper presents an ongoing research aimed at investigating the influences upon the adoption of adaptable building

achieve sustainability is to consider the interest of the actors or the people. These are not rational things that can easily be quantifiable, but have to be taken into account in ensuring sustainable environment (Odeyale, 2012).

THEORETICAL BACKGROUND

Buildings reflect the sociological, cultural, economic and technological aspects of society's level of development (Dodgson et al, 2005). Buildings in general, are products of sociotechnical relations that involve architecture and related professions and it is an essential component of the society. Lin (2006) specified two technical criteria for building adaptability; these are spatial flexibility and constructional openness. Spatial flexibility point to designers' ability in the composition of spaces using grid formation and zonal partitions (Kendall and Teicher, 2000). On the other hand, constructional openness emphasis ease of decomposing and recomposing buildings' elemental components. However, it is argued that it is practically impossible "to pry apart social and technical relations" (Bijker, 1997:25; Odeyale et al, 2010). Hence, it is not sufficient to emphasis the physical aspect alone, there is the need to consider the complex interactions that impact and shape decisions during the design process for adaptable building solution. Understanding of the sociotechnical factors is central to the realisation of the concept of 'true adaptability' in the built environment. Bijker and Law (1992), asserted that technology mirrors the complex nature of the society, therefore it has social implications. Hence, innovation and technology are product of existing opportunities and constraints and it is ubiquitous, affecting and shaping societal conduct in the work place and at home (Bijker and Law, 1992). This social shaping of ideas and interactions is also noticeable in the work of the designers. Understanding of the design process, behaviour, attitude and interactions of the designer and their sociotechnical context is critical to the realisation of adaptable building solution (Dainty et al, 2007, Giddens, 2001). It is important to underscore the network 'field' within which the design processes takes place (see Fig.2). Therefore, this paper report an ongoing study into the influences that impact on the adoption of adaptable building designs in the non-residential sector. This is being carried out by examining the underlying technical and socio-cultural dimensions at play in the formation of adaptable buildings. Amongst the stakeholders responsible for the formation of adaptable buildings, the designer and the design process are being given close attention as the subject of this study.

The adaptable buildings that are designed to adapt to the needs of society based on changing parameters and design criteria. It has been argued that most of the buildings are designed and constructed for singular uses without the thought for their future uses (Beadle et al, 2008). The idea that buildings must be adaptable in order to respond to changing needs of the end users has been previously justified (Gibb et al, 2007). Central to the idea of adaptability is making spaces generic rather than bespoke. Gijsbers, (2006) argues that the clients has preference for flexible non-residential buildings that allow for free flow in planning, than old buildings that do not meet the requirement of the user. Adaptability in building holds the double advantage of opening up new ways of owning or managing properties and customisation, leading to more multi-use developments in response to the user and construction needs (Davison et al, 2006; Gibb et al, 2007).

But it is important to consider available materials on the developing world that has addressed this situation, such as the UN-Habitat report (2006), entitled *State of the World Cities, 2006/ 2007*. The report argues for careful handling of the 'delicate environment' of the developing world and calls for a 'balanced' approach to urban development. Example of how to achieve this was demonstrated in Curitiba, a Brazilian city. The city was given the 2010 Globe Sustainable City Award in recognition of its urban planning excellence and handling of the built environment. In the report suggestions are raised that includes the following: firstly, government should adopt pro-poor reforms (i.e. reforms that are based on the interest of the poor) by making the poor the centre of the drive to sustainable cities. Secondly, the report further suggests that in order to avoid urban clearance, there is need to adopt a phased rejuvenation i.e. remove the dirt by addressing the cause of the dirt. Thirdly, the report asserts also that support should be given to existing urban structures (both traditional and contemporary).

Fourthly, the report encourages the developmental institutions to borrow from the term "governing from the bottom and governing from the top and to connect the two" (UN-Habitat Report, 2006: 170). Lastly, in providing a viable built environment it is important to emphasise that "technical fixes" are not always the solution. Note also that in is important to guard against "significant under estimation and over estimation by avoiding unjustified assumptions and quick fixes" (UN-Habitat Report, 2006: 171). Hence in conclusion to this section it is important to emphasise that the best way to

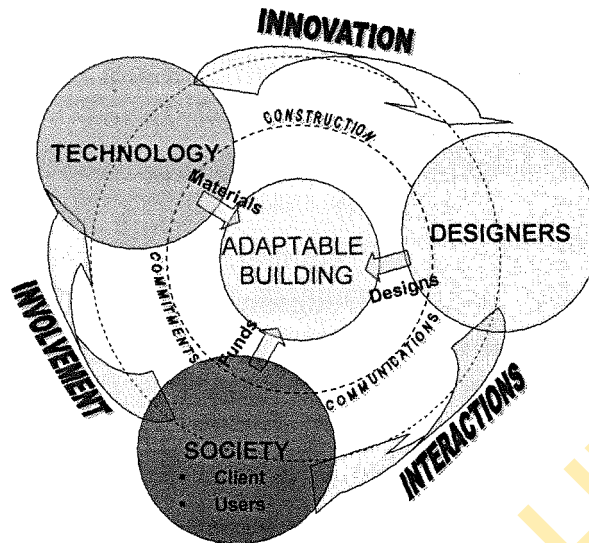


Figure 2. Sociotechnical network field for the development of adaptable building.

Research Questions

In order to understand the role played by designers in the development of adaptable building solution, the following sociotechnical issues is being reviewed in the ongoing study:

- how do the designers respond to the challenge of the adaptable design solution?
- how do the various interactions and design criteria have implications on the design process for adaptable building?
- what are the critical parameters for adaptable building design?
- how do the designers consider the way in which adaptable building will be used through life?

The question of how design ideas are formed or generated has been at the 'core' of design theory. Practitioners (architects, industrial designers, engineers) and theoretician in the academia had sought to explain what constitutes the ingredient of a successful design idea. Various theoretician questions has been raised on how are design ideas generated?, what influences the shaping of a design?, from what is design derived? What takes place between the time an architect take a brief and actual design time behind the drawing board?

There are several definition of design, these include an 'imaginative jump from present fact to future possibilities' (Page, 1972); how to conceive or fashion an idea in the mind; to invent, to formulate or devise a plan. It is also consider as planning out in systematic, usually in graphic form; or creating in an artistic manner, a contrive for a

specific purpose or effect (Moran, 2002). Eagan (2001:55) defined design, firstly, as a 'process by which human intellect, creativity, and passion are translated into useful artefacts'. Secondly, as a methodical approach to apply science and engineering principles so as to convert ideas into useful products'. Design is also learned experience that evolves overtime, that entails the exploration of new ideas through an iterative activities that turns input into output. Friedman (2003) emphasis that design is primarily about 'solving problems, creating something new, or transforming less desirable situations to preferred situations'. In order to achieve this, designers must know how things work and why. Lawson (2006) offer another perspective of design as ill-defined and ill-structured. It is ill-defined in the sense there are several or inexhaustible number of approaches to design solution. Hence, the necessity to have a set of proven criteria and mechanism to support the design process for adaptable building.

RESEARCH METHODOLOGY

The methodological approach for this research is qualitative type which includes the use of case study. This will be carried out by use of a set of interviews conducted with key designers. These will be augmented with ethnographic data collected through participant observation of designers involved in adaptable and non-adaptable building design. Initial exploratory interview was conducted with the use of semi-structured interviews. For the purpose of this paper, initial findings from five open-ended research questions relating to the designers' activities within the innovative design process will be reported. Future data collection will include participant observation, documentary study (reports, drawings) and use of structured interviews with selected architect, structural engineers and project managers from the collaborating industrial partners. Seven exploratory interviews were conducted using the internet and face to face approaches. This resulted in a total of thirty five dialogues as summarised in the findings below. Data analysis method will include content and thematic analysis. The research strategy was to obtain rich data about the attitudes, opinions and experiences of designers involved with the design of conventional and adaptable building that spanned five different countries. The subsequent questions were posed in the interviews.

1. What get you excited to design?
2. how do you generate ideas during the design process
3. how do you measure good design?
4. what determine the time you spent on design?
5. what are the procedure a design must pass through in your firm?

The interviews findings have been assembled into clusters around themes that emerged as the interviews unfolded; these included: motivation for design; process and procedure for building design and criteria for innovative and adaptable design.

DISCUSSIONS: DESIGNERS, DECISIONS and THE DESIGN PROCESS

Why is the designer so important?

The designer engages in design activities that result in solutions and building projects (Johannes, 1992). Literature is replete with findings that supported the idea of the importance of the designer. If the designer gets it right, the design comes out right. The designer interacts with the clients and other members of the design team and uses imaginative or creative means during the design process. Designers are one of the main forces behind the generation of design ideas whose behaviour play a central role during the design process (Cross, 2004). Designers' behaviour entails the manner of approach in decision-making, which is largely informed by education and experience in the formulation or generation of design ideas. Every designers' aim is to achieve high quality design. Designers with experience handle the design process better by multi-level planning approaches and the use of sequential tasking based on complex reasoning. Pugh (1991) and Boulanger & Smith (2001) corroborated this view that designers with experience, handle the design process better by multi-level planning approaches, several sequential tasking and decision based on complex reasoning. Akin (1986) asserted that architects as designers work with abstract representation in a self conscious manner by keeping in mind time, procedure, regulations and how to accomplish the design goals. Understanding designers' behaviour is paramount, because it will provide insight into the motivations, inhibitions and pressures that shapes the emergent or realisation of sustainable and adaptable design solution.

Noble and Kumar (2008) describe design as a collaborative process of several professions rather than a single one; this is particularly true in the development of innovative design solution in the construction industry. The design process can be described to be an 'idiosyncratic process', in that it does not happen automatically, it depends heavily on the 'routinised skills', creativity or creative use of techniques and decisions based on external planning rules (Latour & Woolgar, 1986). Strauss and Corbin, (1989) argued that processes involve sequences of actions and interactions of persons, organisations and communities which respond to certain problems and issues. Therefore the design community respond to a problem through design. Law and Woolgar, (1986:152) describe the interactions taken place during design process in

sociological terms; as a 'thoroughly social construct' that is expressed in certain idiosyncrasies, practises, contextual exchanges, tacit negotiation, discussions and multifaceted gestures. It is of interest to this study to examine how this contextual interactions affect or shapes design decisions for adaptable buildings. Sohlenius, et al (2006) pointed out that the design process is mainly a decision process, which takes account of the needs and expectations of the stakeholders (i.e. the client). Designers, by borrowing from well established knowledge and incorporating this 'routine operational sequences'; enhance decision making processes, thereby harnessing the enormous power of other fields for its purposes. This may be carried out both consciously and unconsciously anchoring on the skills of the designers involved. Bloor (1976) and Río-Cidoncha et al, (2007) both argued that the processes of design are exploring logical alternatives and sequence of actions (Figure 3). However it is possible for logically proven alternatives to be reshaped by the prevailing belief systems of the design team members (Fruchter, 1996).

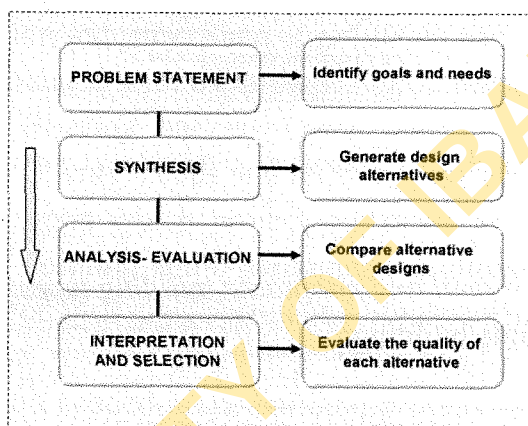


Figure 3. Stages in the design process. Río-Cidoncha et al, (2007)

The context and content of the design process are paramount to the successful evolution of an adaptable design solution. The context refers to certain set of conditions that comes together to facilitate a specific situation (Cross, 2004). The content embodies the design ideas and programmes that are based on organisations' objectives and decisions. The right context makes it more likely that design evolution will take place.

Decision Theory

Decision is a choice made by the designer regarding a 'particular solution for the problem at hand'. Eagan (2001:56). Design is a sequential rationalization of decisions through a process in order to resolve a problem. Eagan (2001) identified three

Building of the past	Building of the future
Non customization of components and building elements	Customization and innovative system for components (i.e. Kit of parts)
Inefficient material usage and energy consumption on the long run	Less in material usage and energy consumption in the short and long run

Brief and Design Protocols

Barrett and Stanley (1999) observed that briefing must be seen as a process not an event. Blyth and Worthington (2001:3) affirm this and defined briefing as “the process by which options are reviewed and requirements articulated with the ‘brief’ as the product of that process”. Many standard literatures have described briefing as a stage, but recent thought have indicated the need for fresh look at the issue of briefing in the construction industry. Shen et al (2004) and Duerk (1993) both argued that problems often associated with other stages of building construction can often be traced back to briefing. Briefing has also been described as the initiating aspect in a building lifecycle. Clients’ needs and requirements are vital to decision making, the brief forms the basis upon which project outcomes are measured. The brief also serves as the means of defining and communicating clients’ needs to the other stakeholders in the construction industry (Barrett and Stanley, 1999; O’Reilly, 1987). Kelly (2002) sums it up as the process involving collection or gathering, analysing and synthesising information needed in the building process and using it to inform decision-making and decision implementation. Hence, the briefing stage also provides a rich context for this study.

INTERVIEW FINDINGS

- **Motivation for design**

There was general consensus that design motivation comes from the clients' brief and design needs which is of interest to the designer. One of the participants remarked that stimulation for design comes from 'challenge of solving the problem and producing a design that satisfies the clients' needs and site conditions (context)'. Some of the participant even emphasis inspiration drawn from personal experience of aesthetics. Similar views were suggested by Johannes (1992) that design does not arise from a vacuum. In addition to experience, skill, knowledge and systematic procedure, the

sequential stages in decision making (see Fig. 4). Firstly, identification and considerations of alternatives and options based on values. Secondly, information on the problem, this stage emphasis the link between the problem and the intended product or solution. Lastly, preferences of the decision makers, which is founded on the value of time, cost and the risk index. Some of the decisions that redefined and reshaped the professional practice are not necessarily logical but are carried out in an iterative way. By identifying and isolating the decisions that shape innovation and in turn shape practice, vital insight can be gained into the issues surrounding the adaptable building solution.. Hence, how decisions are made is also crucial to the design process. Designers make several decisions in the course of creating a product.

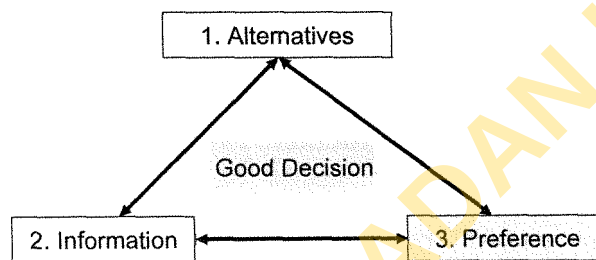


Figure 4. The decision triangle

Table 1: Contrasting between conventional and adaptable building types

Conventional buildings	Adaptable buildings
Fixed internal partition	Movable internal partition, changes in functions and use
Bespoke (single use)	Multi-use (pre-configured, reconfigured)
Non- flexible	Flexibility
Non-extendable parts	Extendable, recyclable without destruction to parts
Sustainability questioned	Sustainability enshrined for site, structure, skin, services, space plan, stuff
Fragmented cost benefit	Lifecycle cost benefit
Non-grid plan layout	Grid and modularity in layout of plan

- Akin, O (1986) "Psychology of architectural design". London: Pion.
- Burns, T and Stalker, G M (1966) "The management of innovation". London: Tavistock.
- Walker, A (1996) "Project management in construction". 3ed. Oxford: Blackwell Science.
- Beadle, K, Gibb, A G, Austin, S A, Fuster, A and Madden, P (2008) *Adaptable Futures: Sustainable Aspects of Adaptable Buildings*. In Dainty, ARJ (Ed.) "ARCOM conference", Cardiff.
- Bijker, W E (1997) *Of Bicycles, Bakelites and Bulbs: Toward a theory of sociotechnical change*. Cambridge: MIT, 3-35.
- Cohen, R S (1981) "The Social Implications of the Scientific and Technological Revolution: A Unesco Symposium". Paris: Unesco.
- Cross, N. (2004) Expertise in design: an overview. *Design Studies*. 25, 427-411.
- Dainty, A, Stuart, G and Bagihole, B (Ed.) (2007) *People and Culture in Construction: A Reader*. London: Taylor & Francis, 30-32.
- DCP, (2005) *Better Living DCP, "Australian Standards"*, Blue Mountains, 4299.
- Douglas, J (2006) "Building Adaptation". London: Elsevier.
- Eagan, R J (2001) *Theoretical foundations for decision making in engineering design*. Washington D.C: National Academy.
- Fletcher, B (1996) *Sir Banister Fletcher's A history of architecture*. Oxford : Architectural Press.
- Friedman, A (2002) "The adaptable home: designing homes for change". London: McGraw-Hill.
- Gibb, A Austin, S, Dainty, A, Davidson, N and Pasquire, C (2007) *Towards Adaptable Buildings: pre-configuration and re-configuration – two case studies*. In: Sharp, M (Ed.), "ManuBuild 1st International Conference - The Transformation of the Industry: Open Building Manufacturing", 25-26 April, Doelen Congress Centre, Rotterdam. Manubuild, Vol. 1, 147-58.
- Giddens, A (2001) "Sociology". 4ed. Oxford: Blackwell.
- Giedion, S (1967) *Space, time and architecture: the growth of a new tradition*. Oxford University Press.
- Habraken, N J (2008) Design for flexibility. "Building Research & Information". 36(3), 290 - 296.
- Hughes, W P. (2001) Evaluating Plans of Work. "Engineering, Construction and Architectural Management", 8(4), 272-283.
- Hughes, W P (2003) Comparison of two editions of the RIBA Plan of Work. "Engineering, Construction and Architectural Management", 10(5), 302-311.
- Johannes, R (1992) Architectural design: a systematic approach: part 1. "Design Studies", 13(1), 71-86.
- Kendall, S & Teicher, J (2000) "Residential Open Building", London: Spon.

factor of 'creative thinking, original ideas and constructive inspiration' of the designer is indispensable (Johannes, 1992:71). Process and procedure for building design

There are two main parallel procedure that were suggested by participants. These included briefing, analysis, synthesis, evaluation and design development. The second parallel involve the "creative leap" that takes the design from "linear" to a "non-linear" process. The two processes are important in the development of adaptable building solution.

- Criteria for innovative and adaptable design.

The discussions concerning defining the measure for a good design, resulted in the identification of base criteria for consideration. In the words of one of the respondent: 'by a series of my own criteria, e.g. How does it relate to its surroundings? Does it add to them or subtract from them? How sustainable and durable is the design? Does it seem as if it has always been there? Does it add up to "more than the sum of the parts"? Does it support life in economic and social terms? Is it restful and timeless, or attention-seeking and trivial? Is it beautifully proportioned or lumpy and inert? Does it reflect the culture in which it is built or is it an expression of globalised corporate uniformity?'

CONCLUSIONS

As earlier stated the study is set out to understand the sociotechnical factors involving the roles of the designer in the shaping of innovative and adaptable building process. This study posits that if the designer's roles in the design process are not adequately supported and enhanced 'true adaptability' may be unattainable. The benefit of formulating a systematic design process for adaptable building is numerous to the stakeholders, the client, funder, user, designer and the manufacturer. To the designer it offers shorter design time, simpler design procedure and more option from the same design. Design process for adaptable building will provide a framework for quality feedback resulting into a greater market advantage. Hence, the imperativeness of the need to develop a decision-support mechanism for designers. This will ensure that key design criteria for adaptability are successfully incorporated within future building designs.

REFERENCES

- Ahmed, S and Wallace, K M (2004) Understanding the knowledge needs of novice designers in the aerospace industry. "Design Studies", (25)2, 155-173.

- Kronenburg, R (2002) "Houses in Motion: the Genesis, History and Development of the Portable Building". London: John Wiley.
- Kostof, S. (1991) "The city shaped-urban patterns and meanings through history". London :Thames and Hudson.
- Kruger, C and Cross, N (2006) Solution driven versus problem driven design: strategies and outcomes. "Design Studies", 27(5), 527-548.
- Lawson, B (2006) "How designers think: the design process demystified". 4ed. Oxford: Elsevier.
- Lin, L-C. (2006) The Adaptability of Two-by-Four Wood Framing Construction, "Adaptable2006 TU/e International Conference on Adaptable Building Structures", TU/e Eindhoven, The Netherlands. Vol 1, 2- 7.
- Odeyale, T.O., Sodagar, B. and Temple, N. (2010) "Sustainable Architecture and Food Production: Impact of Modernity on the Traditional Urban Form". In: Lehmann, S., Al-Waer, H. and Al-Qawasami, J. (Eds), *Sustainable Architecture and Development*, Vol 4, CSAAR Press, Amman, Jordan, pp.341-353.
- Odeyale, T.O. (2010): "Cultural Metamorphosis, Building Tradition and Search for Architectural Identity in Africa: A Case Study of South West Nigeria. In Deependra Prashad (ed.) *New Architecture and Urbanism: Development of Indian Tradition*. Newcastle upon Tyne: Cambridge Scholars Publishing. Pp. 61-72.
- Pawley, M (1990) "Theory and Design in the Second Machine Age". London: Basil Blackwell.
- Pugh, S. (1991) "Total Design". Wokingham: Addison-Wesley.
- Río-Cidoncha, M G D, Iglesias, J E and Martínez-Palacios, J (2007) A comparison of floorplan design strategies in architecture and engineering. "Automation in Construction". 16, 559–568.