Global Journal of Arts Humanities and Social Sciences

Vol.2, No. 4, PP.1-14, June 2014

Published by European Centre for Research Training and Development UK (www.ea-journals.org)

CAUSAL FACTORS IN EVOLVING HOUSING TYPOLOGIES IN BENIN TRADITIONAL ARCHITECTURE

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ABSTRACT: *Houses built in Benin Nigeria, have undergone evolutionary process from the traditional courtyard house to contemporary house type which is rather western style, but have spaces that respond to cultural needs. The morphology of the architectural designs illustrates a house space separated into quarters and sections revealing depth, segregation, controls and levels that explain the design in relation to culture and lifestyles of folks. The structure of domestic spaces resulting in evolution of house typologies in Benin can be traceable to economic, cultural, religious and social factors affecting the residents. The paper however examined evolving house types in Benin in order to identify factors responsible for evolution of spaces in house typologies. The result of the finding revealed that the attitudinal questions solicited and responses elicited were analysed using factor analysis, ultimately the factors responsible for evolution of house typologies were identified.*

KEYWORDS: Causal Factors, Domestic Spaces, Evolutionary Process, House Typologies and Morphology

INTRODUCTION

In primordial times, the Edos had a highly developed method of mud building that is both traditional and formal way of house-planning which they combined, to produced buildings of real architectural quality (Ekhaese & Amole, 2014). Benin City was the capital of a powerful Edo empire. The city was laid out on a formal pattern of broad streets running at right angles to each other along which the houses were built to a regular frontage (terrace), a rare feature in African houses. After the punitive expedition of 1897, major part of the city was destroyed by fire. Today in Benin metropolis the earliest house plans are still identifiable, while around the perimeter (i.e. the outline) of the great Benin wall, it can rarely be traced. Though the wall was originally double-palisade with thick tree trunks, with laid spars five or six feet long fastened together and plastered over with red clay, in front of it was a ditch and a hedge of thorns. It is now entirely ruined with most part so overgrown with bush such that the Benin wall is practically untraceable. In time, most of the buildings in African town are little more than mean shacks, subdivided over and again with a separate family occupying each compartment. Interestingly there are still a few traditional designed chiefs' houses in Benin and in surrounding villages there are important traditional buildings which antedate the Benin Fire. This building

includes palaces, shrine and so on, examples of such buildings today in Benin metropolis includes; *Ogieamen* palace -10 century, *Ero's* palace -1180AD, *Oghian's* palace – 1450 AD, *Ezomo's* palace – 1689 AD, Aro osu 'oba - 900 AD, Aro edion edo - 820AD, Aro ekpenede - 1500AD and so on (Aisien, 2001).

Accordingly, with growth, development, religion, education, social, economy and cultural influences in urban centres new ideas and tastes in design began to evolve giving rise to preferences in house types. And thus the evolution of house typologies in Benin metropolis from traditional courtyard house types pre-dating any western contact in Africa, to long corridor house type ("face me I face you"), then to apartment house types and today to contemporary house types. Beyond all of these relevant facts, the drive of the research is to itemise and document the underlying factors responsible for evolutions of different house typologies identified in Benin City.

STUDY AREA

Benin City is located at latitude 06°19IE to 6°21IE and longitude 5°34IE to 5°44IE with an average elevation of 77.8 m above sea-level. Benin City is a pre-colonial city, headquarter of mid-western region, capital of defunct Bendel State and the present day Edo State. Benin City is underlain by sedimentary formation of the Miocene-Pleistocene-age often referred to as the Benin formation. The city is located in the humid tropical rainforest belt of Nigeria with a population of 762,717 according to the 1991 national population census with a projected population of 1.3 million by 2010 at 2.9% growth rate. Benin City belongs to AF category of Koppen's climatic classification. The rainy season in Benin begins in March/April and ends in October/November. Rainfalls are of high intensity and usually double maxima with a dry little spell in August usually referred to as 'August Break'. Apart from demographic transmutation, Benin City has witnessed rapid territorial expansion mainly due to rapid rural-urban migration. (Atedhor, et al 2011) Since Benin City is the capital of Edo State of Nigeria. Edo State could be defined as a collection gathering of people of united yet diverse identity, who are mostly located in the mid-western part of Nigeria, West Africa (Omoigui, 2005). Edo State was created in 1991 out of the then Bendel State of Nigeria and subsequently divided into Edo and Delta States (UNDP Human Development Reports – 2003 and 2004). According to USAID reports in 2002, Edo State was estimated to have a population of 2.86 million; (in 1991, it had 2.1million, of which 64.47% live in Benin City, that is about 1,035,995 inhabitants) making it almost similar in size to Jamaica with a population of (2.74million), and bigger than Botswana, (1.6million) and Trinidad and Tobago with a population of (1.1million). Edo State has eighteen (18) Local Government Areas. The traditions and customs are systematically being diluted by a move towards modern religious faiths with an underlying rejection of the traditional forms of worship. This has influenced the domestic architecture in Benin, thereby encouraging contemporary architectural style to emerge along the peripheries and new expansions of the City. The map in Fig. 1 shows Benin City and its inner wall, covering four Local Government Area which includes; *Oredo, Ikpoba-Okhan, Egor and Ovia* South-West.

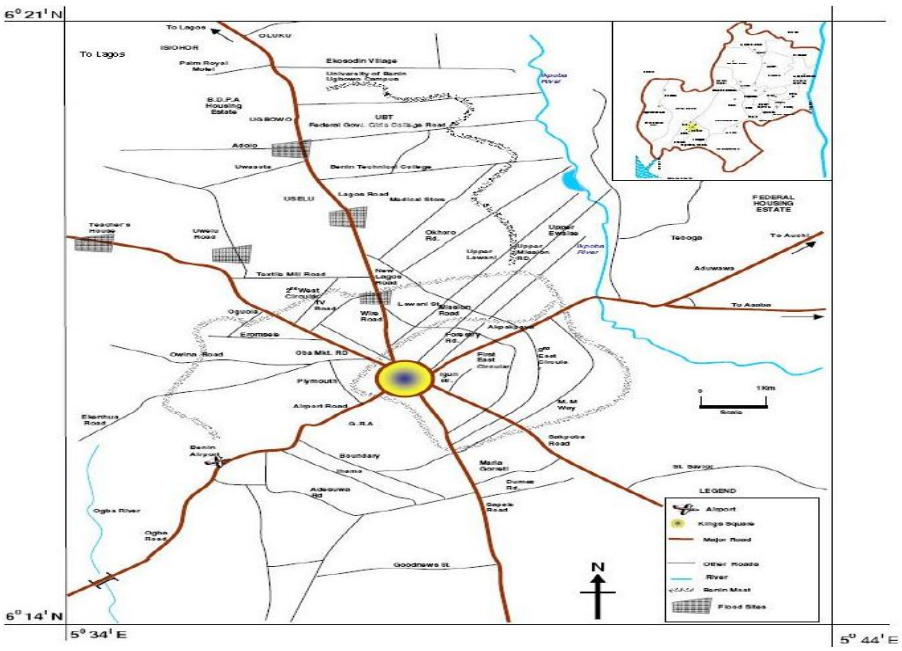


Figure 1: Map of Benin city (Insert Edo State)
Source: Atedhor, et al, (2011)

LITERATURE/THEORETICAL UNDERPINNING

EVOLUTION OF DOMESTIC SPACES

The house design started with materials like thatch, bamboo, mud (laterite) bricks for wall construction while roof construction began with thatch later bamboo, then raffia, corrugated iron roofs and so on. (Ufuah, et al 2005). The presence of guilds system, helped the building style and pattern of Edos traditional courtyard house (which is a reflection of Edo culture in spaces use, organization and meaning) to be handed-on from one generation to another (Ekhaese & Amole, 2014). The advantage of the house design includes; climate friendliness, safety, adequate storage, lighting and ventilation. Apparently time and development has prompted Benin architecture to undergo evolution over the years, in spaces organization, use and meaning. It important to note that the existing architecture was the "Impluvium Concept Architecture" (*oto-eghodo).* Its walls are laid in 4 layers of 3ft each over the sub-structure with single pitched or double pitched roofing system. The roofing material progressively moved from raffia – bamboo – thatched (made of bold leaves '*Ebe'/Ekure* kings raffia) – corrugated roofing sheets – aluminium roofing sheets and so on. The height of superstructure ranges four (4) layers to 8 layers *(Oba's* palace). The Chief's houses and palaces has horizontal fluted on the walls. The impluvium design is for all class of persons but the distinction in social class was exposed through difference in; height of building, size of compound and ornamentation on the building envelop. Therefore the number of social classes in "Edo social structure" determined the number of houses-types (Ekhaese, 2011). In time, it was necessary to design for the family and tenants, i.e. houses were built as means for earning income, thus activity sections in traditional courtyard houses were retain in the new designs. While evolution in houses morphology continued, yet some spaces, fixtures, meaning, use and even certain ways of organization remained unaffected. Consequently several factors

were imagined to have been responsible for the evolution and this included technological, religious, educational, economic and social. But through a topological analysis of Edo house settings documented, this study detects a shift in house typology aspired and developed by people during the last four centuries. Making the traditional courtyard house no longer the prevailing trend, neither are its modified patterns, nor apartment house. Today compact concrete frame houses that encloses all spaces, activities and occupant in one built unit are been build (Ekhaese, 2011). Despite the new design trends some of the traditional house features, such as horizontally fluted walls and segregation between male/female domains, continued to exist even in contemporary house types in Benin. The society norms as factors influence the behaviour of its people and any cultural artefact produced including houses. The reason is that houses should be identified as a multi-cultural by-product. Western influence in architecture around the world as a phenomenon began during the European colonial time and continued afterwards as most schools of architectural and practitioners adopted Western paradigm of design held up in theoretical concept of modern and postmodern movement of architecture (Kyung 2003). This changed the way people around the world use and view domestic spaces. In Benin the effect of Western norms of planning and designing buildings is apparent (Chukwuocha & AC-Chukwuocha, 2014). The finding obtained from house plan documented (2009 & 2010) in Benin City were analyzed: to measure the degree of their conformation to traditional house types, to measure other cultural and technological aspects that influences the design, to detect traditional morphological patterns of relationship evolving in today house settings and to identify other influencing factors. However, result of analyses reveals that certain spaces have evolved over the years in the different house-types across Benin City while other spaces have remained and continued. For instance a reflection on space sections like: cooking and eating, storage of household goods, visitors, convenience in Benin house has slightly evolved in location, organization, use and meaning thus have shaped house pattern and have led to other house-types design. In the field survey done in the study, a total of eleven houses typology were identified, Table1: shows a cross section of house types across the Benin City.

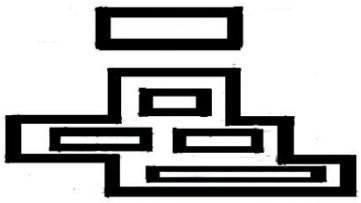
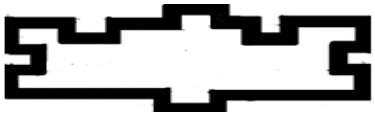
	House types in Benin	Location (zones)	Plan form characteristics	Categories of types in each zone in Benin	Number
1	The Palace Compound House-Types -"*Eguei Oto-Eghodo*",	Core residential zone		Three (3) house types	3
2	The Family Compound House-Types. -"*Owa Eken*	Core residential zone			142
3	The modified traditional courtyard house-type	Core residential zone			56
4	The Adapted Family-Compound Benin House,	Intermediate residential zone		Seven (7) house types	43
5	The hybrid Family-Compound Benin House	Intermediate residential zone			163
6	The Common Central Corridor House-Types (Face Me I Face You),	Intermediate suburb and planned estate residential zone			225
7	The Detached Bungalow House-Types ***(****"Owa Eken'ebo")*	Intermediate, suburb and planned estate residential zone		Five (5) house types	165
8	The Semi-Detached Flat of Single Floor House-Types	Intermediate and suburb and planned estate residential zone			132
9	The Semi-Detached Flats of Double Floor House-type	Intermediate and suburban residential zone			77
10	The Detached Double Floor Villa House-Types.	Planned estate residential		Four (4) house types	20
11	The detached double floor Duplex house-types	Planned estate residential			28
	Total		**ELEVEN (11) HOUSE-TYPE IN BENIN CITY**		**1054**

Table1: The House-Types As Identified During the Field Survey

THE RESIDENTIAL AREAS IN BENIN CITY

Benin City is divided into four residential zones and are documented as- Core Area, Intermediate Area, and Suburban Area and planned estate Settlement Area as shown in Figure 2 below.

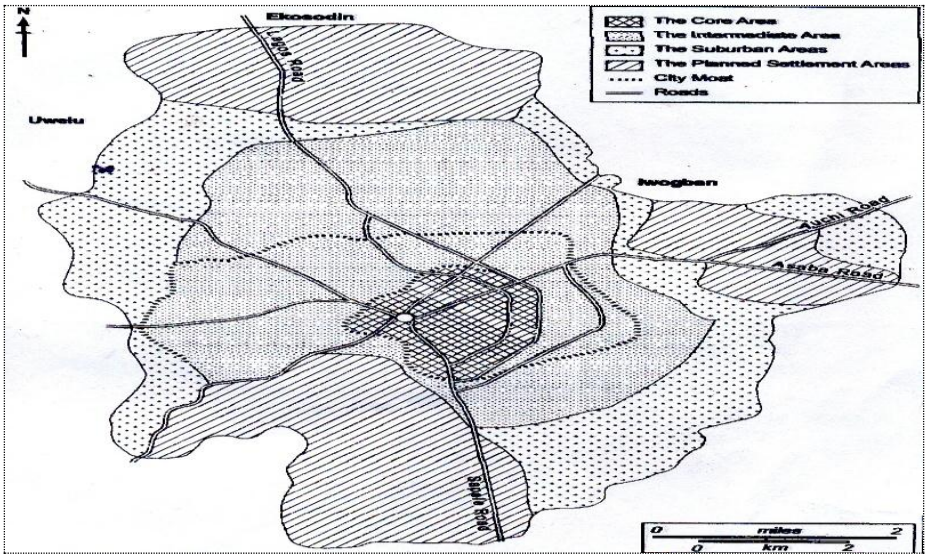


Figure 2: Map showing residential zones in Benin-city
Source: Ekhaese (2011)

The core and intermediate residential areas of Benin are the oldest part of the City having the oldest architecture or residential houses. The core area by its planning and arrangement is assigned to royal families. At the city core known as the king's square (ring road) is the Oba's Palace strategically located. The ring road connects all major roads to other parts of the city. Also in the core are *Ogbe* Quarter (Residential Area of the Palace Chiefs) and *Ore Nokhua* (residential area of the Town Chiefs) and former *Ogiso* Palace, all located within the inner wall. The city core is today the administrative centre of the state, covering state house of assembling complex, *Oba* market, the museum, *Orukpota* hall, central hospital, Benin prison and so many other parastatals. While the intermediate residential area accommodates six residential palaces *(Uzamas*':- *Oliha, Edohen, Ezomo, Oloton, Ero, and Eholo n'Ere)* located outside the inner wall and the Queen Mother (i.e. seventh member of the *Uzama)* and *Edaiken*, (i.e. the heir-apparent) are outside the outer wall. The inner walls enclose the core residential area, but the outer wall is inside the intermediate residential area. The government reservation area (GRA), government house and other government quarters are located in the intermediate residential area. The suburban area and the planned estate settlement part of the City accommodate the residential areas of other families in Benin City, that is all the housing estates in the city, which includes : the government civil servants estate, the privately own estates, the public estate, the public-private partnership owned estate etc. and other institutions.

Therefore a cross-section through the residential areas of the entire City reveals a chronological growth from the core residential area where the oldest form of architecture can be found, to the intermediate residential area, and then the suburban residential area and finally the planned estate area where most of the contemporary architecture are located. In other words, a cross-sectional study through Benin reveals an historical evolution of house-types in the core residential area (i.e. the residential palace of the monarch and the royal families residential areas) to the most contemporary house-types in the planned residential estates area of the city, apart from the Oba's family and the other royal family members (i.e. the Ogbe Chiefs and Town Chiefs), every other family in Benin migrated from villages around the City (Ekhaese, 2011). This further shows that a cross-sectional study will give the necessary historical perspective of growth of the ancient City of Benin.

STUDY METHODOLOGY

Observation show that domestic spaces in all house categories (i.e. traditional courtyard house, common corridor/apartment house and contemporary house) across the four residential zones (core, intermediate, suburban and planned estates) flow in almost similar ways; the observed variation is a product of the house size. In other words, the house categories have similar sections across Benin-City. But, Contemporary houses introduced a range of new spaces such as hall (patio), guest bedroom, and guest convenience, garage, car porch, anti-room (foyer), gym room, study, laundry. Houses from traditional or apartment category have fewer spaces and may not have spaces labelled as gym or dining. The assessment of houses categories, reveal some similarities between the morphological patterns of traditional and apartment plans, but reflect division of house into male and female domains representing a separate sex domain connected to each other at different levels. Contemporary house plans containing both male and female quarters and surrounded by linearly related sets of open spaces and circulation areas.

Houses were identified, characterised and classified into several house types based on physical organization and space design along four residential zones across Benin City as shown in fig 2. Total residential houses across the four residential zones projected from 1991-2009 is 52, 850 houses (with core having 5020houses, intermediate covering 17980houses, suburban contains 22950houses and planned estate enclosed 5900houses). 2% of 52, 850 amounted to 1051houses i.e. in the core zone, 2% of 5020houses is 100.4, 2% of 17980 amounted to 353.6 in the intermediate zone, while 2% of 22950 is 459 in the suburban zone and 2% of 5900 is 138 in planned estate. This amounted to a total of 1051 selected houses in the entire City. 1054 questionnaires were administered to household heads, and all the questionnaires were returned appropriately responded to. In addition interviews guide were used for 14 key-informants drawn from the cross section of chiefs, elders, landlord, dukes, university dons and professionals. For the purpose this study, the 21 attitudinal questions in section B of the questionnaire where analysed using factor analysis (i.e. the principal component analysis) in order to determine the fundamental factors responsible for the evolving house typologies.

RESULT AND FINDINGS

Indeed the study has identified some contributory factors responsible for evolving house typologies in Benin metropolis. It also observed that factors can be guessed and predicted. However a collection of architectural plans of different house typologies across the city as well

as examining the attitudes and responses of residents through questionnaires and interviews guide has revealed that the connecting factors drawn from social, cultural and economic characteristics of residents in Benin is responsible. Analysing the findings using factor analysis method has determined the actual factors causing evolution of house typologies in Benin City over past four centuries or more.

5.1 Data on Responses and Attitudes of Respondents

In the core zone, after factor analysing the 21 items using extraction method (i.e. principal component analysis) and rotational method (i.e. varimax with Kaiser Normalization) as well cross checking with the scree plot, the 21 items were loaded in three important factors which are: factor 1- Tenure Composition and Socio-Culture of the Residents, Factor 2 - Religion and Belief of the Residents and Factor 3 - Privacy and Comfort of the Household Head. These three factors are responsible for the attitude and determine the responses of the residents toward the evolution of space in the house in the core zone of Benin.]

Rotated Component Matrix

Factors	Items (attitudinal questions)		Component		
			1	2	3
Factor 1 Tenure composition and Socio-culture of the residents	b70	Houses should be designed/built for extended family	.807		
	b69	The space around the house differentiates one house from another	-.686		
	b57	How important is it to have separate sleeping place different from bedroom in the house?	-.535		
	b54	How important is it to have separate space for cooking to you and your family	.522		
	b62	The cooking space should be separated from the main house.	-.508		
	b67	Houses should accommodate more than one household	.503		
Factor 2 Religion and Belief of the respondents	b68	The religion of the people is a major factor that determines the meaning, use and organization of domestic space in the house.		.632	
	b61	How important is the separation of activities within the Benin house?		.602	
	b59	1s it important to have a separate space for worship inside the house?		.571	
	b72	The size nuclear family living shape the use of space in a house.		.552	
	b60	How important to you is it to have toilets inside the house?		-.547	
Factor 3 privacy and comfort of the household head	b53	How important is the separation of activities in the house into distinct functional space?			.585
	b55	How important is it to have cooking space inside the house?			-.577
	b64	It is important to have a separate sitting room for receiving visitors in a house.			.564
	b65	The sitting room in the house should be separated from other spaces.			-.509

Table 2: Factor Responsible For Evolving House Typologies In Core Zone

But in the intermediate zone the factors are slightly different; Table 3 shows that four factors were identified using the same factor analysis. The factors include: Factor 1- Taste and Choice

of Residents In Design, Factor 2 - Privacy and Comfort, Factor 3- Size of the Household, and Factor 4 – Religion and Belief of Residents. Of these four factors, two repeated themselves (i.e. privacy and comfort as well as religion and belief of residents), this shows that it is the predominant factors as far as evolution is concern in domestic spaces in Benin. The other two factors (size of the household as well as taste and choice of residents in design) account for other house-types that are not in the core zone but are in intermediate zone as result of evolving domestic space.

Rotated Component Matrix

Factors		Items (attitudinal questions)	Component			
			1	2	3	4
Factor 1 taste and choice of residents in planning and design	b62	The cooking space should be separated from the main house.	.656			
	b58	How important is it to have a separate resting space different from your sleeping space for use during the day?	.571			
	b67	Houses should accommodate more than one household.	.564			
	b64	It is important to have a separate sitting room for receiving visitors in a house.	.554			
	b69	The space around the house differentiates one house from another	.535			
	b61	How important is the separation of activities within the Benin house?	-.534			
	b66	A house should have front and back.	.404			
Factor 2 privacy and comfort of the Household head	b56	How important is to have separate space for eating to you and your household?		.681		
	b54	How important is it to have separate space for cooking to you and your family?		.667		
	b55	How important is it to have cooking space inside the house?		.651		
	b60	How important to you is it to have toilets inside the house?		.537		
	b53	How important is the separation of activities in the house into distinct functional space?		.487		
Factor 3 size of the household	b70	Houses should be designed/built for extended family			.742	
	b73	Family compound house is preferred to single family house.			.691	
	b71	Houses should be designed/built for nuclear family (i.e. man, his wife and children)			-.534	
Factor 4 religion and belief of the residents	b65	The sitting room in the house should be separated from other spaces.				.676
	b68	The religion of the people is a major factor that determines the meaning, use and organization of domestic space in the house.				.579
	b59	1s it important to have a separate space for worship inside the house?				.522
	b57	How important is it to have separate sleeping place different from bedroom in the house?				.443

Table 3: Factors Responsible For Evolving House Typologies in Intermediate Zone

Meanwhile, in the sub-urban zone after subjecting the 21 items to factor analysis using extraction method, rotational method and scree plot, four factors were identified in (table 4) this includes:

Factor 1- Occupier Type and Socio-Culture of Residents, Factor 2 - Privacy and Comfort of Household Head, Factor 3 – Preference of Household Head, and Factor 4 - Taste and Choice of Residents In Design. There are two same factors from the core zone (tenure composition and socio-culture of residents as well as privacy and comfort of resident), also there two factors from the intermediate zone (privacy and comfort of resident as well as taste and choice of residents in design) and a new factor was added which is preference of household head. This shows that some domestic spaces from core and intermediate zones are continuing in the sub-urban zone with some additional new spaces due changes in preference of the owner of the houses in the suburban zone. It also implies that the evolution in domestic space will lead to new house-typology in the zone

Rotated Component Matrix

Factors		Items (attitudinal questions)	Component			
			1	2	3	4
Factor 1	b70	Houses should be designed/built for extended family	.750			
	b73	Family compound house is preferred to single family house.	.679			
Tenure composition and socio-culture of the residents	b72	The size nuclear family living shape the use of space in a house.	.665			
	b57	How important is it to have separate sleeping place different from bedroom in the house?	.533			
	b69	The space around the house differentiates one house from another	.511			
	b67	Houses should accommodate more than one household.	.441			
	b68	The religion of the people is a major factor that determines the meaning, use and organization of domestic space in the house.	.431			
Factor 2	b55	How important is it to have cooking space inside the house?		.809		
	b60	How important to you is it to have toilets inside the house?		.746		
privacy and comfort of the household head	b53	How important is the separation of activities in the house into distinct functional space?		.576		
	b62	The cooking space should be separated from the main house.		-.481		
	b54	How important is it to have separate space for cooking to you and your family		.465		
Factor 3 preference of the household head	b58	How important is it to have a separate resting space different from your sleeping space for use during the day?			.756	
	b56	How important is to have separate space for eating to you and your household?			.711	
	b59	1s it important to have a separate space for worship inside the house?			.672	
Factor 4	b66	A house should have front and back.				.754
	b63	Food items should be stored in a designated kitchen space.				.598
taste and choice of residents in planning and design	b61	How important is the separation of activities within the Benin house?				.448
	b65	The sitting room in the house should be separated from other spaces.				.425

Table 4: Factors Responsible For Evolving House Typologies in Sub-Urban Zone

And in the planned estate zone, the factor analysis shows that only three factors are deemed satisfactory after loading the 21 non- redundant items. From Table 5 the factors are: Factor 1- Tenure Composition and Socio-Cultural Background of Resident, 2 - Privacy and Comfort of Household Head and 3 – Preference of Household Head. This reveals that there are two factors from the core zone (tenure composition and socio-cultural background of resident as well as privacy and comfort of household head), one from the intermediate zone (privacy and comfort of household head), two factors from the suburban zones (privacy and comfort of household head as well as preference of household head). The interpretation of these is that certain factors are constant and are continuing across the four residential zones in Benin. This means that these factors account for the continuity of some domestic spaces in the houses across Benin-City, while some factors that do not cut across the four zones are responsible for the pockets of evolving domestic spaces experienced across the entire City.

Factors		Items (attitudinal questions)	Component		
			1	2	3
Factor 1 Tenure composition and socio-cultural background of the resident	b58	How important is it to have a separate resting space different from your sleeping space for use during the day?	.641		
	b57	How important is it to have separate sleeping place different from bedroom in the house?	.627		
	b70	Houses should be designed/built for extended family	.623		
	b64	It is important to have a separate sitting room for receiving visitors in a house.	.614		
	b62	The cooking space should be separated from the main house.	.611		
	b67	Houses should accommodate more than one household.	.550		
	b59	1s it important to have a separate space for worship inside the house?	.544		
	b65	The sitting room in the house should be separated from other spaces.	.426	.424	
Factor 2 privacy and comfort of the household head	b56	How important is to have separate space for eating to you and your household?		.653	
	b55	How important is it to have cooking space inside the house?		.616	
	b60	How important to you is it to have toilets inside the house?		.594	
	b54	How important is it to have separate space for cooking to you and your family		.554	
	b53	How important is the separation of activities in the house into distinct functional space?		.538	
	b63	Food items should be stored in a designated kitchen space.		.531	
Factor 3 preference of the household head	b71	Houses should be designed/built for nuclear family (i.e. man, his wife and children)			.707
	b69	The space around the house differentiates one house from another			.635
	b72	The size nuclear family living shape the use of space in a house.			.616
	b68	The religion of the people is a major factor that determines the meaning, use and organization of domestic space in the house.			.526

Table 5: Factors Responsible For Evolving House Typologies In Planned Estate Zone

DISCUSSION

six (6) fundamental factors that determined the people's responses and attitudes towards evolution in domestic space across the four residential zones in Benin, resulting in three broad categories of house-typologies (i.e.; traditional courtyard house, ii. Common corridor/apartment house and iii. Contemporary house). These factors include: Tenure composition and socio-culture of residents, religion and beliefs of the residents, privacy and comfort of residents, taste and choice of residents in design, size of household and preference of household head. These factors shape and re-shape house-types evolving in the entire City, and they also determine the location of houses in different residential zones in Benin.

	Core Zone	**Intermediate Zone**	**Sub-Urban Zone**	**Planned Estate Zone**
Factor1	Tenure composition and socio-culture of the residents		Tenure composition and socio-culture of the residents	Tenure composition and socio-culture of the residents
Factor 2	Religion and belief of the respondents	Religion and belief of the respondents		
Factor 3	Privacy and comfort of the residents	Privacy and comfort of the residents	Privacy and comfort of the residents	Privacy and comfort of the residents
Factor 4		Taste and choice of residents in design	Taste and choice of residents in design	
Factor 5		Size of the household		
Factor 6			Preference of house owner/household head	Preference of house owner/household head

Table 6**:** Factors That Determine the People's Responses and Attitudes Towards Evolving House Typologies due to Domestic Space Evolution across the Four Residential Zones in Benin

IMPLICATION OF RESEARCH: SYNTHESIS OF HOUSE TYPOLOGY

During the last four centuries, findings showed that the type of houses built in Benin has evolved from traditional- modified impluvium design- institutional- contemporary house with its compact design. Evolution in house-typologies over time in Benin was done in other to outline factors responsible, using available records and compare them to samples collected to strengthen the findings. Also subject samples of contemporary Benin houses and compare it to traditional houses for a better understanding of effect of evolution on social and cultural values inherited by Edos. Spaces in all house-types are characterized in similar way; the observed variation is the dwelling size. Contemporary house types may introduce a range of new spaces such as hall, guest apartment, etc. Smaller traditional/ apartment houses have fewer spaces and may not have spaces like garage, laundry, gym room, study and so on. The designs of Benin contemporary houses integrate the storage with the female quarter, locate the kitchen in close proximity to the living room for quick services, and position female courtyard at same depth as the male one. Contemporary houses adhere to the principle that group all spaces and function in one built area.

Admittedly government agencies initiated apartment house design, yet the design respects the cultural life style of folks. This is so because of research were conducted by officials at that time to insure the compatibility of design to local cultural needs. Traditional and apartment houses respond to the cultural needs of its users. The morphology of both plans show a house space divided into male/female quarters, female spaces located at a deeper level than male spaces, a segregated anti-natal room, storage and a separated kitchen from other living quarters, to isolate women from eyes of visiting male. In all types of houses, there is a clear gender classification of a house space; there are fixed male spaces and other female spaces. However, such distinction may not exist in small houses with limited space. The distribution as well as arrangement of spaces in Benin houses is quite distinctive; simultaneously they do specify spaces for private or collective use as observed in traditional courtyard houses. But, any given activity can take place in various parts of the house, depending on the nature of the activity and the status of its participants.

CONTRIBUTION TO RESEARCH AND PRACTICE

The evolutionary process of Benin traditional architecture described in this study shows that it is not simply the changing arrangement of spaces, but the interaction between the spaces and its activities within the domestic environment that can define the new spaces. There is an indigenous concept of level-distinction that was actively evolved in this process. Guided by these underlying forces, the evolution of houses in Benin has followed certain topological paths to adapt the old inherited properties to the new physical environment, and the user's attitudes and responses described above proves that these values do persist through the formal changes.
One major contribution therefore, is that the findings would assist policy makers, practitioners, professionals and researchers, to advocate, design and construct "all-inclusive buildings" (residential building especially). Specifically during the conceptualisation and implementation stages of provision of house; users preference, socio-culture dispositions of users, religion of users, believe system and full participation of users is key to providing an "all-inclusive housing", which could be a regenerative development in other palace. Therefore without prejudices to climatic and environmental issues, the above parameters are vital for provision of "homes" irrespective of class of persons and location of the communities.

CONCLUSION

In examining attitudes of residents in the entire city to determine evolving house-typologies across the four residential zones, it is important to note that certain variables have been analysed and interpreted. Some of these variables were selected along space segments like; cooking and eating space, storage space, sleeping space, outdoor spaces, visitor's space and personal hygiene. The analyses reveal the causal factors responsible for evolution of house-typologies in Benin-City. There were six (6) factors that determined the people's responses and attitudes to of house typologies across the four residential zones in Benin, resulting in three broad categories of house-type (i.e.; traditional courtyard house, ii. apartment house and iii. contemporary house). These factors structure and restructure the domestic architectural evolution in Benin City, and they also determine the location of the houses in different residential zones in Benin. However,

these factors are likely to be same for all forms of architectural and house evolution, transformation in Africa and beyond.

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