

## **Recombinants: Theoretical Propositions to Practical Dispositions for Resolving Conflicts in African Metropolis and Periphery**

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### **Abstract**

*This paper is exploratory and uses Accra, Ghana as a case study to draw examples of conflicts and contradictions that exist between African Metropolis and Periphery. This paper argues that the attainment of sustainable merging of the periphery and the metropolis is a complex system of urban development practices and theories. To connect the metropolis and the periphery, individual behaviors and institutions, this paper proposes “recombinant design” as a tool to investigate the modularity of the periphery and metropolis. This paper concludes amongst others that the development of recombinant tools based on “localisation theory” provides great opportunities for establishing an ‘African Centre of Recombinant Urban Studies (ACORUS)’ for study of the dynamics of the relationship between the African Metropolis and its periphery.*

**Keywords:** Recombinant, African Metropolis and Periphery, Conflicts, Contradictions, City of Accra, Ghana

### **1.0 Introduction**

This paper seeks to use Accra, Ghana as case study to draw theoretical examples of conflicts and contradictions that exist between African Metropolis and its Periphery. This paper is structured into five distinct parts. Following this introduction is a snapshot of recombinant as a theory/theorem. The third part deals with recombinant as design or social tool for development and the fourth part explores in depth, ways in which the theory/theorem of recombinant tools could be applied to better understand the City of Accra and beyond to affect other cities of sub-Saharan Africa in general. The final section recaps some of the issues of this paper. Responsive urban architecture development and land-use planning system appear complicated and seemingly elusive with a mixture of virtues and vices. As a result, major cities of Ghana are confronted with challenges similar to what pertain to most growing African cities, seen for example in urban sprawl, that lead to suburbia growth associated with inappropriate high density development, inadequate infrastructural/services provision, lack of preservation of traditional architecture and public open spaces, to generate a responsive land-use and African urban living environment. Literature is replete with the need and great demand to tackle urbanization and built environmental issues in most African cities. A number of scholarly works (including those by Stren, 1994; Onibokun, 1994; Mabogunje, 1994; Antwi, 2000; Mbiba and Huchzermeyer, 2002; Mahama and Dixon, 2006; Jenkins et al., 2007; Crook 2007; as well as Obeng-Odoom, 2009/2010a/2010b) constitute a significant body of positive contribution to urbanisation issues in Africa and Ghana as evidenced for example in the observation that, nearly 90 percent of the low income displaced tenants and families relocate to the peripheral areas or suburbs in Kumasi-Ghana (Adarkwa & Oppong, 2005). From these peripheral locations, they commute over considerable distances to work daily in the city of Kumasi (Adarkwa & Oppong, 2005). That hints the useful role the periphery plays for urban outcast whose livelihoods depend on the city. Yet, the city and the periphery are perceived as two different entities. Tactics for resolving and managing conflicts (e.g. spatial) to merge the city [metropolis] and suburbia [periphery] remain non-existent or a minimalist concept in Africa even though the periphery ‘functions as an important locus of acculturation into city life and a vivid zone of transition between rural and urban cultures’.

Nuanced with the forgoing, this paper discusses amongst other pertinent questions as follows:

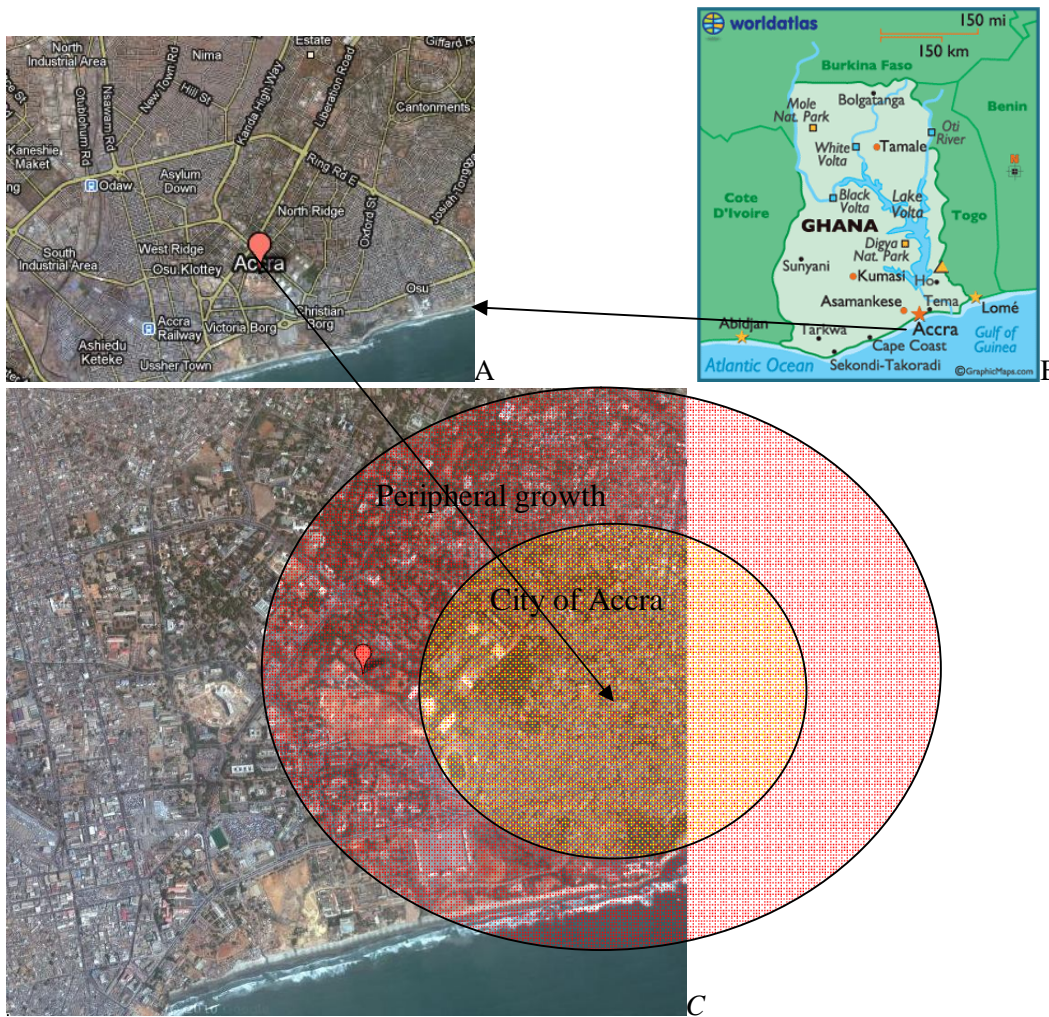
### **1.1 Can the Periphery be thought of as a Full-Fledged Part of the City that Reaches Beyond a Mono-Functional Zone for Dwelling?**

This section seeks to dwell on existing body of knowledge especially by Kevin Lynch (1960) and Léon Krier (1984; 1980; 1977) with Accra, Ghana as an example to deal with the above question. Krier, in his writings demonstrates that mono-functional zoning that is productive, commercial, administrative, educational, residential, and recreational is the technical instrument of fragmentation. Krier and others including Paul Drewe have argued for and against mono-functionalism and blamed urban design masters such as Le Corbusier for city-peripheries throes. Krier on one hand notes; ‘functional zoning is not an innocent or neutral planning instrument; it has been the most effective means in destroying the infinitely complex social and physical fabric of pre-industrial urban communities, of urban democracy and culture. The true grandeur of a city depends on the intelligence of its physical and social organization, on the familiarity of its public spaces, the beauty of its monuments and finally, on the wisdom with which one knows how to exploit the beauties and the accidents of nature to the greatest advantage of all its citizens. It depends, above all, on the identification of each citizen with the present as much as with the past’.

As perceived, the periphery destroys the structure of the historical centre. Mono-functional zoning promotes high concentrations of administrative and commercial activities in the historic centre, and the periphery remains a purely residential area. The old city becomes the heart of too-large a body, and under the combined pressures of building speculation and the growing tertiary sectors, it slowly disintegrates, with the population in the centre dropping. Mono-functional zoning can be identified as the most radical instrument in the destruction of cities, for example, in Europe. Not only does Mono-functional zoning promote land and building speculation at the large scale, but it also strengthens the centralising tendencies of political bureaucracies and justifies the monopolization of commerce. Thus, it destroys the refined and delicate physical fabric of most cities, and it has also become the most brutal means for destroying the social fabric and the complex cultural and economic relationships within the surviving urban community (Krier, 1980).

Paul Drewe on the other hand, notes that; the creation of mono-functional zones for dwellings, work and facilities, for example, for recreation, naturally induces traffic between zones and the rise of the automobile and the accompanying expansion of the road network have produced a “mobility problem” that is still unsolved today (Drewe,2000). Again, Drewe (2000) asserts that ‘mainstream urbanism has rather been dominated by zonal thinkers like Le Corbusier(1929/1987) as opposed to network thinkers such as Ildefons Cerdà (1815-1876) who, when the government of a time in Spain finally gave in to public pressure and allowed Barcelona’s city walls to be torn down, realised the need to plan the city’s expansion so that the new extension would become an efficient and liveable place, unlike the congested, epidemic-prone old town within the walls. And Frank Lloyd Wright, whose thoughts on suburban design, proposed subdivision layout that strayed from traditional suburban lot layouts on a philosophy of community planning hinged on decentralization, Wright advocated that new communities must be away from the city but all services and facilities should be by factories side by side, and that farm and home could coexist.

Positing Accra, Ghana against the foregoing, Accra which began in the 16<sup>th</sup> century as a small trading- town, has been for the past 125 years, the economic and political capital of Ghana. Currently Accra is a major West African city and home to about 3.5 million people. It exhibits the benefits as well as the disadvantages of a world metropolis. Accra’s growth is phenomenal as its peripheries are engulfing other regions such as the eastern and southern eastern as well as the western portions of Ghana (Figure 1).



**Figure 1: A and B- Context Maps of Accra and Ghana; C – Conceptual Boundaries of the City of Accra and that of the Peripheries Merged to form One Entity**

Boundaries of the City of Accra and that of the peripheries are apparently merged but the two are notably administered as separate entities. The peripheries of Accra are treated as “mono-functional zone for dwelling” but the reality is that since most of the periphery-dwellers are ‘ejected occupants’ of the City of Accra, they inadvertently become dependants of the city; especially for socio-economic livelihoods because all the industries, economic and recreational facilities are concentrated in the city of Accra. What makes Accra case interesting is that the peripheries of the City appear mono-functional zones without mono-functional planning qualifications: there are sub-metropolitan authorities with conflicting devolved responsibilities for the day-to-day functioning of the peripheries. For instance, the sub-metropolitan authorities depend on the central government for development budget allocation amongst many others. That somewhat corroborates Léon Krier’s argument elsewhere that mono-functional programming and the privileged allocation of financial resources to such programmes are its political and economic motor as industrial development is effected through the fragmentation of integrated and multifunctional complexes of cities, villages, districts, quarters, parishes into mono-functional suburban zones viz. residential neighbourhoods, campuses, shopping centres, industrial parks and so forth.

Again, Accra as metropolis is formed by a smaller independent and autonomous suburbs and towns. However, Accra does provide for functions of the daily lives of those suburbs and towns as single city. The growth and form of the peripheries seemed to have rendered the Accra metropolis centre-less and limitless, even though a metropolis must have a center and a well-defined, readable limit. The peripheries of Accra have grown to assume the same dimension of the city of Accra (Figure 2). Yet, the peripheries depend on Accra amidst dearth of infrastructural networks, especially roads and transport.

The peripheries are characterised by amorphous planning of high density residential and commercial as well as recreational and educational facilities: And, perhaps, the peripheries could be thought of as a full-fledged part of the city that reaches beyond a mono-functional zone for dwelling.



**Figure 2: Maps Juxtaposition of (A) Portion of Accra City Central Core and (B) Portion of Periphery [Suburban] of Accra, Ghana**

The conclusion from the foregoing, perhaps, supports Krier's assertions that 'the city needs no suburb to live and the suburb cannot live without a city and a suburb without a city is like a cancer without a body...mono-functional zoning of cities only dissolves complex urban communities into cities for sleeping, cities for working, and cities for consumption. The only solution now is not better public transport, but the elimination of much of the commuting traffic by integrating again urban functions like living/working in the same urban area'. The question that follows, then, is:

### 1.2 How can the Connections between City Centre and Periphery be Conceived?

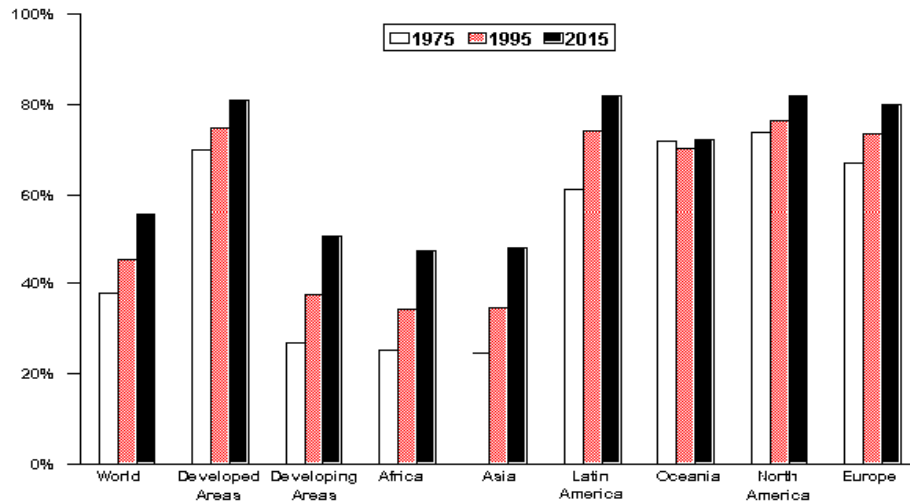
There exists a plethora of works published on the city, the peripheries or suburban, much of which, purely, combine theoretical or technical in contemporary philosophical approach to deal with the developed or the so-called first world countries. This paper contends that tactics for resolving and managing conflicts (e.g. spatial) to merge the city [metropolis] and suburbia [periphery] remain non-existent or a minimalist concept in Africa even though the periphery 'functions as an important locus of acculturation into city life and a vivid zone of transition between rural and urban cultures'.

Ellen (1996), unless otherwise mentioned, asserted that there has been tremendous growth of suburbs around cities after the Second World War and there have been a number of attempts to "reconceived the city" without a consensus among urban social scientists. Since 1960s, cities have tended to be defined in a deliberately vague way, as settings in which certain characteristics appear together but need not occur in every case. Likewise urban historians as well as architectural historians, theorists, and critics have also been unwilling to pin definitions on the city. It is not surprising, then, that urban designers – architects and planners – have been struggling with the question of how to define the canvas upon which they labour. Among several others, it is argued elsewhere that "if the city is redefined, so the process of urban growth- or urbanization – and the lifestyle of city dwellers – or urbanism-must *be*. Manuel Castells (1972) proposed that we define the urbanization in global terms as the integration of regions into the world system and that we define urbanism as the culture of the world system. Immanuel Wallerstein (1974) similarly redefined urbanisation as the growth and development of the world capitalist system and urbanism as the culture of this system.

Again, eschewing the "traditional dichotomy of city and country," Loic Julienne and Jean-Marie Mandon chose to speak of "an urbanity which touches all sectors of activity". It is not, says Ingersoll, the city which is disappearing but the suburbs as all well become urban.

After the Second World War when massive suburbanization could not be explained by Ernest Burgess's theory of graduated concentric zones, and as "way of life" in cities no longer conformed to Louis Wirth's description in "Urbanism as a way of Life"; Herbert Gans revised Wirth's thesis in "Urbanism and Suburbanism as Ways of Life", in which was the explanation that rise of metropolitan regions in the United States revealed the inadequacy of the rural/urban distinction posited by Wirth. Rather, one's "way of life," Gans said, has less to do with whether one lives in the city, the suburbs, or the countryside, than with such factors as social class, life-cycle stages and rates of social mobility, unless people are free to make choices.

**Figure 3: Percentage of the World's Population Living in Urban Areas, 1975, 1995 and 2015**



**Source: Population Information Programmes 1996).**

Circumstances of urbanism are occurring very fast and moving ahead, and not backwards and therefore pragmatic methods and theories are needed. The world as a whole is experiencing a rapid rate of urbanisation (Figure 3). The growth rate of urban population on African continent is high and it is predicted to rise by several authors (see, for example, Mabogunje, 1968; Aluko, 1971; Bascom, 1955; Olotuah, 2005). The resultant effect of the high rate of urbanisation has been the formation of more peripheries or suburban areas which are fully grown with population to that of a city but continually depend on their parent cities for survival with consequent conflicts and contradistinctions.

As indicated earlier on in this section, there is the need for tactics to resolve and manage conflicts to merge the city and periphery as the periphery functions as an important locus of acculturation into city life and a vivid zone of transition between rural and urban cultures. In that regard, this paper proposes *Recombinant Design* as methodology to generate "informed urban design model(s)" to serve as policy rationale for the creation of sustainable metropolis in Ghana and Africa in general. Following the foregoing theoretical insights, the next section considers *recombinant* –its theory and practice, and explores how it can be applied to urban design issues for African metropolises and peripheries, with Accra, Ghana, as the focus.

## **2.0 Recombinant as Theory/Theorem**

Many biologists and other scientists as well as entrepreneurs have benefited from the concept of "recombination or recombinant" as a theory that arose from the works of Stuart Kaufman, a biologist at the Santa Fe Institute. As a medical doctor by early training, Kauffman moved to the study of theoretical biology and complex systems in positions at the University of Chicago and University of Pennsylvania, with international recognition in his work to bring complex systems thinking to issues of evolution. Recombinant refers to the way that old ideas can be reconfigured in new ways to make new ideas. Metaphorically, the underlying thesis of recombinant is an insightful way to model the production of new knowledge as a natural centerpiece for a theory of endogenous aggregative growth. The growth may lie not so much in one's ability to generate new ideas or to process an abundance of potentially new seed ideas into usable form.

It has been applied into benefit and enhanced knowledge in economics (Weitzman, 1998), biophysical and biochemical and DNA studies and analyses (see, for example, Glazer and Nikaido, 2007; Arakawa and Philo, 2002; Fry, 1992; Bennett, 1986; Richards, 1978), and in the music industry known as *InSoc Recombinant*.<sup>1</sup>

### **3.0 Recombinant as (Urban/Social) Design Tool**

According to Luoni (2011) recombinant as a design tool integrates metrics from ecology, engineering, architecture, urban design, and social policy into design patterns not possible in their respective parent disciplines. Much like recombination in the biological sciences where the concept has been applied extensively, recombinant is tactically plausible for policy triangulation, administration, and design through various development tools involving ecotone, matrix, transect, map, and table to sort and sequence environmental resources. Likewise, design's disciplinary capacity is thickened by the absorption of another's tools (metadisciplinary), enabling co-evolutionary planning approaches solicitous of feedback with the social; and environmental energies of a local context. Again, Luoni (2011) asserts that, the University of Arkansas Community Design Center (UACDC) in its mission to advance in Arkansas through education, research, and design solutions to the physical environment is developing a repertoire of recombinant design methodologies applicable to community development issues in Arkansas with currency that goes beyond the state. UACDC design solutions introduce a triple bottom line, integrating social and environmental measures with economic development. UACDC works multilaterally with clients, collaborators, and government agencies to build networks that facilitate creative development, triangulating development in policy, best management practices, and design. Recombinant development embeds ecological metrics into otherwise obdurate or stubbornly entrenched planning conventions governing land-use policy and infrastructure (Luoni, 2011).

On the social realm, recombinant is akin to the Chicano activist and writer Armando Réndon's *concept of the Barrio Union* – where neighbourhoods-based organisation, with its own community or multi-use facility, charged with providing a forum for residents to meet, discuss their needs and interest, share their understanding of issues facing their communities, and develop actions plans to address these concerns; residents select officers from among themselves to speak for the communities in question to: “bargains collectively with city, county, state or authorities to remedy possible complaints, such as street lighting, paving, sewer improvements, improve police for fire protection, ... zoning laws, and distribution of jobs in businesses or industries relocating near communities”(Orosco,2007).

In order to fully comprehend the complexity of cities, David Grahame Shane (2005) argues that recombinant urban modelling techniques provide a methodology for understanding the polymorphous layers of influence that shape the city form. Although the Shane's modelling techniques provide a clear and concise method of analysing the morphological changes that have occurred throughout history, we would argue that his generalised approach concentrates mainly on the top down approaches to design, engaging primarily with architects and planners with little mention of clients or the users of urban space. This paper wishes to argue that embodying perspective of the city user, has the potential to understand the successes and failures of the functionality which are prescribed to urban space and additionally highlights the potential of practices that deviate from conventional uses. Finally, the ensuing section, albeit not tentative, as way forward, explores ways in which the theory/theorem of recombinant tools including: media of mapping, cinematography and/or as narratives could apply to a better understanding of how the City of Accra and its peripheries functionally interrelate. The paper seeks to illuminate the city of Accra in an attempt to make the city more legible and more comprehensible to its inhabitants.

### **4.0 The Way Forward: Recombinant as Urban Design Study Tool in Ghana**

Reflexively, the application of recombinant as urban design study tool in Ghana, specifically to the city of Accra is apparently weak because little is known of the theorem in the field of urbanism in developing nations; unlike the developed nations (Francis and Lorimer, 2011). A painstaking World Wide Web searches for developing nations that have used or using recombinant as urban development/design tool always end in futility thus far. Notably, recombinant as a tool abounds in the medical sciences, for example, in the area of biotechnology in developing and third world countries (see, Kenny and Buttel, 1985; Niba, 2003, Madan, 2005). Therefore, with hindsight, poverty, illiteracy, logistics and integrating the knowledge of recombinant for diverse urban development professional use are possible but surmountable obstacles in a developing nation like Ghana.

<sup>1</sup> See, [www.informationssociety.us](http://www.informationssociety.us) for more on *InSoc Recombinant*

Insomuch as these obstacles are real, constant contact with a complex and ephemeral visual landscape of the city has bred a population remarkably adept at navigating those complexities casually, indifferently. And, whole academic fields, from public relations to visual studies programs, have emerged to examine and control the verbal-visual amalgam that makes up much of the texture of everyday life (Isenstadt, 2001). In the light of the foregoing, this paper proposes to explore mapping, narratives and the media of photography and cinematography/filming as recombinant tools/tactics in Accra, Ghana.

#### **4.1 Understanding the City through Medium of Mapping**

In order to fully comprehend the complexity of cities, Shane (2005) argues that recombinant urban modelling techniques amongst others provide a methodology for understanding the polymorphous layers of influence that shape the city form. "Mapping has emerged in the information age as a means to make the complex accessible, the hidden visible the unmappable mappable" (Abrams and Hall, 2006). Coincidentally, there is Cultural mapping project using Danish-Osu, a historic suburb of the City of Accra with the aim of gathering data on cultural assets and human resources of the city of Accra in order to generate strategies to turn Accra into a cultural capital of West Africa. This paper suggests the use of mapping as a pilot recombinant tool to configure day time, night time, seasonal time to show the complexities and temporal dimensions of Danish-Osu, Accra. We present the argument that mapping as a recombinant tool will help teach the city of Accra dwellers to perceive their cities in new ways. Mapping could be applied to pull up, for instance, three major issues together, that is: what can the heritage space ( the historic places, sites and structures of Danish Osu), the people (various groups such as the local residents, tourists and visitors who move through the space at Danish Osu), the people's activities ( everyday life ways, special occasions, festive events e.g. the August Street Carnival streaming through the space) create scenarios for future meaningful development of such historic space to help make Accra an African cultural capital?

It is envisaged that the use of recombinant tools would not only enhance the proposed Accra Cultural Mapping project but carry relevance to the author's desire for future postgraduate programme in urban studies to be mounted in Department of Architecture of the Kwame Nkrumah University of Science and Technology, Kumasi. The use of cultural mapping in Accra would pay particular attention to the use of public space and disused space which could be considered as the residual remnants of urban development. The uses of other cities in Ghana are also plausible.

#### **4.2 Understanding the City through Narratives**

There are increasing demands that public spaces should not be only convivial but also *communicative* – of history and other narratives, requiring the incorporation of media into the environment (Frenchman, 2001). The role of the media cannot be overemphasised as a tool for democratization (Warf, 2007). According to Holcomb (2001) for society to function, there must be some shared image of reality. Without that, communication is impossible. The demand for "mediated environments" is raising important challenges for designers not only in terms of how to physically construct such places, but also in deciding what messages they should carry. The response is leading to what we see today as new practice of city design (Jenkins, 2001). Reading from Lynch (1960) the perspective of someone who studies cinema and not cities, what one can find most striking is that he discusses urban form in a vocabulary that closely parallels the ideals of the classically constructed narrative. Lynch (1960), for example, speaks of a "melodic" structuring of landmarks and regions along a succession of paths, which he suggests might follow a "classical introduction-development-climax-conclusion" pattern (Jenkins, 2001).

#### **4.3 Understanding the City through the MEDIA of PHOTOGRAPHY, CINEMATOGRAPHY/FILMING**

In addition to the foregoing, the paper proposes to use photography, cinematography and/or video film making techniques to develop a way of analysing the patterns of interaction with the built environment of the City of Accra. Photography and cinematography have the capabilities of capturing the city's images from wider perspective or everywhere (the 110<sup>th</sup> floor, the sidewalk, lower balcony, pages of a guide book, the country side, on a street corner, at the train station, [on the train or bus, or air], through the rear-view mirror or to say the least, 'the way things are' (Jenkins, 2001) By capturing the temporal qualities of open urban space, the study would investigate the association between types of use and spatial organisation as a way of demonstrating the effect that various different models of urban design have on its users. Information retrieved from the video films would be correlated against additional data sets such as climatic conditions, historical background/case histories and narratives, economic land values, and documented social vices to provide an illustration of the relationship between the inhabited reality and normative models of urban space.

Lynch (1960) saw urban design studies as a way of building a more educated and appreciative audience for city design. He recognised that our images of the cities are shaped partially by formal properties of the cities themselves and partially by the process of perception through which we construct mental representations of those properties (Jenkins, 2001). An ill-considered development deal may mar the urban landscape, blocking our ability to see important landmarks or move fluidly between nodes. In one sense, the cinema would seem to be the perfect form to express the dynamic properties of the city of Accra, since like city design, cinema is a “temporal art form”; but the cinema brings its own expectations about what a classically constructed story looks like – expectations that urban-based stories are often unable to satisfy. Classically constructed stories remain focused on particular characters, their motives, their goals, their memories, and their experiences. The challenge for the filmmaker is to create a story that situates the individual in relation to the city in such a way that the film preserves what is distinctive about the metropolis-congestion, simultaneity, heterogeneity, randomness, fragmentation in short incoherence (Jenkins, 2001).

Arguably, the Accra study would present the viewpoint that the embodied-perspective of the city-user has the potential to understand the successes and failures of the functionality which is prescribed to urban space, and additionally highlight the potential of practices that deviate from conventional uses. The use of urban space is directly connected to a multitude of social values and technological implications. This new urban modelling technique (recombinanting) essentially plays on the importance of appropriation of space to determine its future use, and gives more urban actors the tools for shaping the built environment.

### 5.0 Concluding Remarks

Thus far, this paper has briefly presented and theoretically explored the city of Accra as a case for African metropolis and ‘cancerous’ peripheral growth. Again, it has hinted that the periphery plays a useful role for urban outcasts simply because their livelihoods depend on the city. Yet, the city and the periphery are perceived as two different entities. This paper contends that as long as African governments do not provide housing and socio-economic opportunities within cities for their ever increasing populations, then attention must be given by Great African cities to their peripheries which are almost invariably, sporadic, and mad in nature, with “disturbing possibilities”. Following, this paper has argued for recombinant as tools/tactics for resolving and managing conflicts (e.g. spatial) to merge the city [metropolis] and suburbia [periphery] in Africa so long as the periphery ‘functions as an important locus of acculturation into city life and a vivid zone of transition between rural and urban cultures’. For instance, Corbusier argued that:

*The city determines everything: war, peace and toil. Great cities are the spiritual workshops in which the work of the world is done. The solutions accepted in the great city are those which are singled out in the provinces; fashions, styles, development of ideas and technical methods. That is the reason why the reorganization of the great city carries with the renewal of the whole country (Corbusier, 1929/1989:85).*

African cities appeared “brutalised and battered by torrents” of the peripheries but *recombinant DNA* of design and planning *resilience*<sup>2</sup>(Stern,2011) that include residential, commercial, and retail components, transportation networks, public events spaces, enhanced access and effective connection between City and Periphery as well peoples’ perceptions/narratives should lead the way to avoid conflicts between African metropolis [city] and periphery [suburban] as research elsewhere (Falk,2008) has shown that urban development that includes a wider social mix-matrix and careful design and management, is formula for conflict avoidance. This paper has explored mapping, narratives and the media of photography and cinematography/filming as recombinant tools/tactics for Accra, Ghana; and therefore, concludes that development of recombinant tools based, perhaps, on “localisation theory”, is likely to provide great opportunities for establishing ‘African Centre of Recombinant Urban Studies (ACORUS)’ for training/practice and research. ACORUS is still exploratory and perhaps, Design, Development and Research (DDR) 2013 Conference can join this exploration for developing African cities through recombinant design.

<sup>2</sup>Complex Adaptive Systems (CAS) suggests- an adaptive theory as an emerging discipline that studies the way systems self-organise, learn, and change proactively. It is argued that a central concept of CAS theory is *resilience*- the ability of a system to absorb disturbance and adapt to change without passing a threshold into a qualitatively different state and resilience as a concept provides an important conceptual framework for designers to navigate or even celebrate complexities in the built environment to create cities, communities and systems that are resilient and sustainable.



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