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Urban sustainability in the context of Lagos mega-city

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This paper contributes to the pertinent discourse on mega-cities and urban sustainability, using Lagos mega-city as case-study. It is derived from the growing need to appreciate the wider implications of the mega-city phenomenon as a unique feature of contemporary urban change in the developing countries. This need is imperative in the context of Lagos, which has come into fresh limelight through recent flurry of research interests, as well as the initiation of plans for the Lagos Mega-City Project. The purpose of this study is to examine the essential links between the mega-city phenomenon and urban sustainability, with a view to informing policy and strategies for the sustainable development of Lagos mega-city. The research method is a case-study approach involving qualitative analysis of secondary data related to Lagos mega-city, and primary data from participant-observation. The introduction examines the global emergence of mega-cities and the forces driving them. This is followed by a concise review of literature, including the unique challenges facing emerging mega-cities. The paper highlights and justifies how the Lagos Mega-City Project has become imperative as a basis for proposing the application of sustainability principles to the Lagos mega-city reality. It offers policy recommendations from an architectural and urban design perspective and concludes on the need for all stakeholders to respect sustainable development principles, and engage in greater synergy on the future of mega-cities.

Key words: Lagos mega-city, mega-cities, sustainable development, urban sustainability.

INTRODUCTION

At the turn of the millennium, and for the first time in human history, about half of the world's population began to live, not just in 'cities', but in 'mega-cities' (Massey, Allen and Pile, 1999). A mega-city by definition is a continuous urbanized area with population of at least 10 million people (UNCHS, 1996). In this league of cities are Tokyo, New York City, Mexico, Mumbai, Sao Paulo, Delhi, Shanghai, Calcutta, Dacca, Buenos Aires, Los Angeles, Karachi, and Rio de Janeiro. Table 1 is a composite of five lists showing the world's mega-cities in 1992, 1995 and 2007, with projections for 2015 and 2025. The disparities between the lists are accounted for by the varied sources from which the table was derived. The unique case of variation in the projected figures for Lagos (for 2015 and 2025) may be attributed to the fact that the latter are based on the most recent National Population Census data, which have been highly controversial and variously disputed. A number of key features of contemporary urban population growth are apparent, namely:

The largest cities appear to have been growing at the most rapid rates, a phenomenon which has given rise to

the concept of urban primacy – the demographic, economic, social and political dominance of one city over all others within an urban system.

The largest cities are no longer in the developed world but in the developing world. By the end of the twentieth century the world's 20 most populous cities have switched from a Euro-American focus to a developing world bias within only 20 years.

Of the 27 'mega-cities' predicted for the year 2015, 18 will be in Asia, 5 in Latin America, 2 in Africa, 2 in North America and none in Europe.

Hall and Pfeiffer (2000) identify three forces which have forged the explosive growth of twentieth century cities as: industrialization, the transportation revolution, and the parallel telecommunications revolution. A fourth factor could be political transformation; though less momentous in its impacts, decolonization has fostered the growth of new national capitals.

The transforming force of the twenty-first century is the informational revolution, uniting previously separate technologies – computer, telecommunications, and television – into a single medium for the generation,

Table 1. Mega-cities of the World 1992, 1995, 2015, 2025.

Urban Agglomeration	Popl. 000s	Ran k	Popl. 000s	Ran k	Popl. 000s	Ran k	Popl. Projn. 000s	Ran k	Popl. Projn. 000s	Rank
	1992*		1995**		2007***		2015**		2025***	
Africa										
Lagos			10,287	15			24,437	3	15,796	12
Cairo			9,656	19	11,893	15	14,494	16	15,561	13
Kinshasa									16,762	11
Asia										
Tokyo	25,772	1	26,836	1	35,676	1	28,701	1	36,400	1
Bombay (Mumbai)	13,322	6	15,093	5	18,978	5	27,373	2	26,385	2
Shanghai	14,053	5	15,082	6	14,987	7	23,382	4	19,412	9
Jakarta			11,500	11			21,170	5	12,363	19
Karachi			9,863	18	12,130	12	20,616	7	19,095	10
Beijing	11,433	10	12,362	8	11,106	16	19,432	8	14,545	15
Dacca			7,832	22	13,485	9	18,964	9	22,015	4
Calcutta	11,106	12	11,673	9	14,787	8	17,621	12	20,560	8
Delhi			9,882	17	15,926	6	17,553	13	22,498	3
Tianjin			10,687	13			16,998	14		
Metro Manila			9,280	21	11,100	17	14,711	15		
Seoul	11,589	9	11,641	10			13,139	18	14,808	14
Istanbul			9,316	20	10,452	19	12,345	20	12,102	20
Lahore			5,085	27			10,767	22	10,512	24
Hyderabad			5,343	26			10,663	23		
Osaka	10,535	13	10,601	14	11,294	14	10,601	24	11,368	22
Bangkok			6,566	25			10,557	25		
Teheran			6,830	24			10,211	26		
Moscow					10,452	18			10,526	23
Guanzhou									11,835	21
Shenzhen									10,196	25
Chennai									10,129	26
South America										
Sao Paulo	19,235	2	16,417	2	18,845	4	20,783	6	21,428	5
Mexico City	15,276	4	15,643	4	19,028	3	18,786	10	21,009	6
Buenos Aires	11,753	8	10,990	12	12,795	10	12,376	19	13,768	16
Rio de Janeiro	11,257	11	9,888	16	11,748	13	11,554	21	13,413	18
Lima			7,452	23			10,554	25		
North America										
New York	16,158	3	16,329	3	19,040	2	17,636	11	20,628	7
Los Angeles	11,853	7	12,410	7	12,500	11	14,274	17	13,672	17

Sources: *Castells (1996), p.404 – World's Largest Urban Agglomerations. **UNCHS (1996), pp.451-456. ***UN-HABITAT (2008) – The World's Mega-cities, 2007 and 2025 (Data from UN Population Division, World Urbanization Prospects: The 2007 Revision)

storage and exchange of information. However, the experiences of many developing countries seem to evidence the inimical rather than the beneficial impacts of these forces of urban change, resulting in dire physical problems, as well as severe social and economic

challenges (Satterthwaite, 1999).

METHODOLOGY

The research method adopted is a case-study approach involving

qualitative analysis of archival materials, publications of the Lagos State Government and its agencies, and other secondary data related to the case-study, including available census data. In addition, primary data were obtained through participant-observation; the researcher purposively spent time within the Lagos metropolis between 2005 and 2007 to observe and record the state and quality of physical and social infrastructure, these were reinforced by residual memories of experiences derived from an early childhood in the Lagos of the 1960s.

These research techniques were complemented by a review of literature on urban sustainability and mega-cities. The analysis of this body of data provides the evidence that justify how the Lagos Mega-City Project has become imperative, and the basis for proposing the application of sustainability principles to this mega-city reality.

LITERATURE REVIEW

Sustainability and cities

Sustainable development is about 'meeting the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). Sustainability as a concept attempts to achieve, simultaneously, the goals of an improved environment, a better economy, and a more just and participative society, rather than trading off any one of these against the others. While its primary context is global, sustainability is seen to be meaningful when it is practiced through local initiatives with global significance. In its application to cities, sustainability adopts the metaphor of metabolism; a city can be defined as becoming more sustainable if it is reducing its resource inputs (land, energy, water, and materials) and waste outputs (air, liquid, and solid waste) while simultaneously improving its liveability (health, employment, income, housing, leisure activities, public spaces, and community) (Newman and Kenworthy, 2003).

The last two decades have witnessed considerable growth in the literature on sustainability and cities. Haughton and Hunter (1994) build on the growing interest in the role of cities in the sustainable development process, examining the problems of urban environmental degradation and the contribution cities can make to broader goals of attaining global sustainability. Mitlin and Satterthwaite (1996) offer a wide-ranging scope of themes and ideas, entering into the discourse on the meaning and application of 'sustainable development', while providing useful guidance and warnings. Pugh (1996) evaluates sustainability in practice, assessing Agenda 21 and subsequent developments from the 1992 Rio de Janeiro 'Earth Summit'.

Brandon et al. (1997) offer a range of studies on the evaluation of the built environment for sustainability, and the dynamics and mechanisms required to transform the existing built environment to make it more sustainable. Others have highlighted the potential advantages that cities have for addressing sustainable development goals. Although the concentration of people, enterprises

and automobiles (and their wastes) in cities is often seen as 'a problem', high densities and large population concentrations also bring certain advantages for meeting human needs and for environmental management (UNCHS, 1996).

Satterthwaite (1999) covers the key issues on how cities can be made compatible with sustainability goals, including case studies of cities with innovative sustainable development plans. A common theme running through most of these contributions is their emphasis on both the potential advantages of cities for the achievement of sustainable development goals and the extent to which 'good governance' is central to realizing this objective. Other contributions to the literature include Brebbia et al. (2000), Layard et al. (2001) and Mander et al. (2006).

Beyond the issue of sustainability and cities, the relationships of sustainability to architecture, construction, housing, landscape, and site design have also been examined. Carpenter (2001), Brown et al. (2000), and Graham (2002) contribute to sustainable architecture and construction. Edwards and Turrent (2000), and Hal Anke van (2000) offer insights into sustainable housing. Benson and Roe (2000) and Thompson and Sorvig (2000) investigate the links between landscape, site planning and sustainability.

The concern with urban sustainability in the developing world lies not simply in the level of urbanisation, but in its sheer scale and rate of growth (Drakakis-Smith, 2000). Continuing population growth in mega-cities is a reflection of the remarkable tolerance by humankind of a very high level of spatial concentration of population. This does not however invalidate the challenges confronting these mega-cities, though sometimes taken to apocalyptic dimensions (Davis, 2006).

Challenges of emerging mega cities in the developing world

A transformation of the urbanization process is being experienced in the developing countries of the world in recent decades, producing different urban forms and social consequences. In contrast with the case when accelerated urbanization began in Western Europe and North America, this rapid "Third World" urbanization is most notable in countries with the lowest levels of economic development rather than the highest, that is, industrialization lags far behind the rate of urbanization. This, Davis (2004) describes as a form of urban 'involution' marked by vast expansion in combination with economic decline.

Cities in the developing world in general face major urban challenges, not least because global economic restructuring has decimated social opportunities and prosperity for many citizens. The urban planning issues posed by these mega-cities are important, not only because they directly influence the lives of vast numbers of people, but also because other emerging cities will

have much to learn from the experience of the 'giants' even if certain issues they face are unique to their contexts for reason of scale. Higher rates of in-migration exacerbated many urban population problems such as unemployment, inadequate housing, food and water supply, pollution, and traffic problems. Provision of transportation and other infrastructure constitute major planning issues. The management challenges posed by growth on the mega-scale are substantial (Jones and Visaria, 1997). These are accentuated by the trend of rapid urbanization with far fewer resources than the developed countries possess (Paddison, 2001). The health impacts of urban environmental problems are staggering. An estimated 1.3 billion people, mainly living in developing world mega-cities such as Cairo, Lagos, and Mexico City, are breathing air that the WHO deems unfit for humans (Serageldin, 1997). How this urban population increase takes place – its speed and direction, and how the needs of this increased population are provided for – will have enormous implications for human welfare. It is likely that mega-cities will grow larger, large numbers of smaller cities and towns will grow bigger and new towns will emerge.

Castells (1996) captures the most ironic complexity of the mega-city in these words, "Mega cities concentrate the best and the worst... they are connected externally to global networks and to segments of their own countries, while internally disconnecting local populations that are either functionally unnecessary or socially disruptive... It is this distinctive feature of being globally connected and locally disconnected, physically and socially, that makes mega cities a new urban form..." (Castells, 1996: 405-7).

The overall situation of mega-cities in developing countries is characterised by a conflicting mixture of excessive poverty and wealth; severe unemployment and great economic opportunities. Huge divisions often split apart the populations of these cities with great chasms dividing elite from poorer areas. For all the excitement and attraction offered, they also hold out the converse; spiralling inequality and insecurity. The threat of social explosion, the notion that the chasms of inequality might erupt in social unrest is rife. Although the very size of mega-cities establishes them as major foci of social relations within the globe, these are focal points with potential either for positive growth, for the generation of despair, or possibly for both. However, there is a perspective that African mega-cities still hold great potential for human vitality, creativity and productivity. What can be made of the potential of great agglomerations of people depends on the resources available, the intellectual and professional foundations for sustainability and the political will to do what is required and equitable.

In the case of Nigeria, fuelled by the oil-boom in the 1970s, the enduring by-products of rapid urbanization include: slums, overcrowding, poor sanitation, air and water pollution, clogged sewers, solid-waste contamination, staggering urban traffic, illegal conversion of

land-use and unbridled physical development without appropriate legislation, regulation and enforcement. Inability to march the housing needs with available resources and inadequate physical infrastructure to accommodate the population explosion have impinged negatively on social infrastructure. Mass unemployment among the youths gives rise to insecurity and rising crime wave. According to Mabogunje (2008), although metropolitan Lagos is undeniably the only mega-city, a few other urban centres – Kano, Port Harcourt, Warri, Ibadan, Ilorin, Kaduna, Aba and Abuja – are already showing indications of growth towards metropolitan status, tending towards emerging as potential mega-cities. Early recognition ensures that the challenges are addressed before they become very complex or expensive.

The challenges notwithstanding, sustainability and city-size are not necessarily antithetical. Indeed, mega-cities can contribute to sustainability through their economies of scale and density, which help to reduce per capita levels of resources and wastes and improve liveability. However, there is the need to constantly reinforce these advantages because local capacity limits on air, water and land are frequently stretched in larger cities. Nevertheless, the idea that small cities are more sustainable than large ones is not supported by empirical evidence; thus it is important that all cities, regardless of size, engage the sustainability agenda.

The study context: Lagos

The coastal city of Lagos, currently the fifth largest city in the world, is situated within latitudes 6°23'N and 6°41'N and longitudes 2°42'E and 3°42'E (Figures 1-2). There is a 'current flurry of interest in Lagos' as the city comes under 'intense critical scrutiny', particularly from architectural and cultural theory and critical urban studies. Lagos has been the focus of few international art exhibitions: "Depth of Field" at South London Gallery (2005); "Century City" (2001) in London; and "Africa: the Artist and the City" (2001) in Barcelona. The Harvard School of Design's "Project on the City" also focused on Lagos (Gandy, 2005).

The growing interest in Lagos is with good reasons. The mega-city is one of the most rapidly urbanising areas in the world, and Nigeria's most populous conurbation. Its growth has been phenomenal, both demographically and spatially. From a population of about 25,000 in 1866, Lagos reached 665,000 by 1963, covering 69.9 (km²) (Table 2). It became over ten million in 1995 thus attaining by UN definition, the status of a mega-city. It is projected to become the third largest mega-city in the world by 2015 (UNCHS, 1996). Its population is presently about 18 million according to National Geographic (2009).

Lagos may also assume the role of an archetype for the urbanization process at work in the global South.



Figure 1. Map of Nigeria showing Lagos and the States of the Federation. Source: Adapted from: www.motherlandnigeria.com/geography.html.

Studying Lagos may elucidate the understanding of the workings of an African city; how it can continue to function as a city at all in the face of an acute lack of basic amenities and public infrastructure deemed essential in traditional urban studies (Jameson, 2003). Lagos exemplifies many of the cities of the global South, which face an escalating crisis in terms of the provision of basic services such as water, housing and mass transit systems. The striking paradox is that vast demographic expansion over the past two decades has occurred in a context of extensive economic decline. Lagos portrays 'the paradoxical characteristics of the contemporary African city as a dysfunctional yet dynamic urban form' (Gandy, 2006).

Occurring simultaneously with the global transformation in patterns of urbanization, there has been deterioration in the state of the city since the post-independence euphoria of the early 1960s, through the era of the 1990s when Lagos assumed the dubious label of being regarded as one of the worst cities in the world, up to its present transitional state. The history of Lagos in the last two decades of the 20th century has been marked by severe deterioration in quality of life: high level of poverty;

proliferation of slums; environmental degradation; dilapidated and congested road system; massive flooding; disrupted sewerage network; and increasing crime rates (George (2010)). In terms of spatial expansion, from its original lagoon setting, the sprawling city has engulfed a vast expanse of surrounding areas including over 100 different slums (Figure 2). Abiodun (1997) affirms that the vitality of Lagos's economy and its nodal position in the national economy and transport networks explain its growth, despite the breakdown of many basic infrastructure services and the difficulties caused by this for both economic enterprises and individual residents.

Much has been studied and written about this sub-Saharan Africa's largest metropolis. The genesis of the present dysfunctions has been historically traced to the failure of successive colonial administrations to tackle the problems of overcrowding, disease and inadequate urban infrastructure (Aderibigbe, 1959; Echeruo, 1977; Gale, 1979); and the concomitant strategy of segregation between wealthy enclaves and the supposedly indifferent indigenous population (Home, 1983; Peil, 1991). The cultural dualism between 'modernity' and 'tradition' reflected in a disproportionate concentration of urban

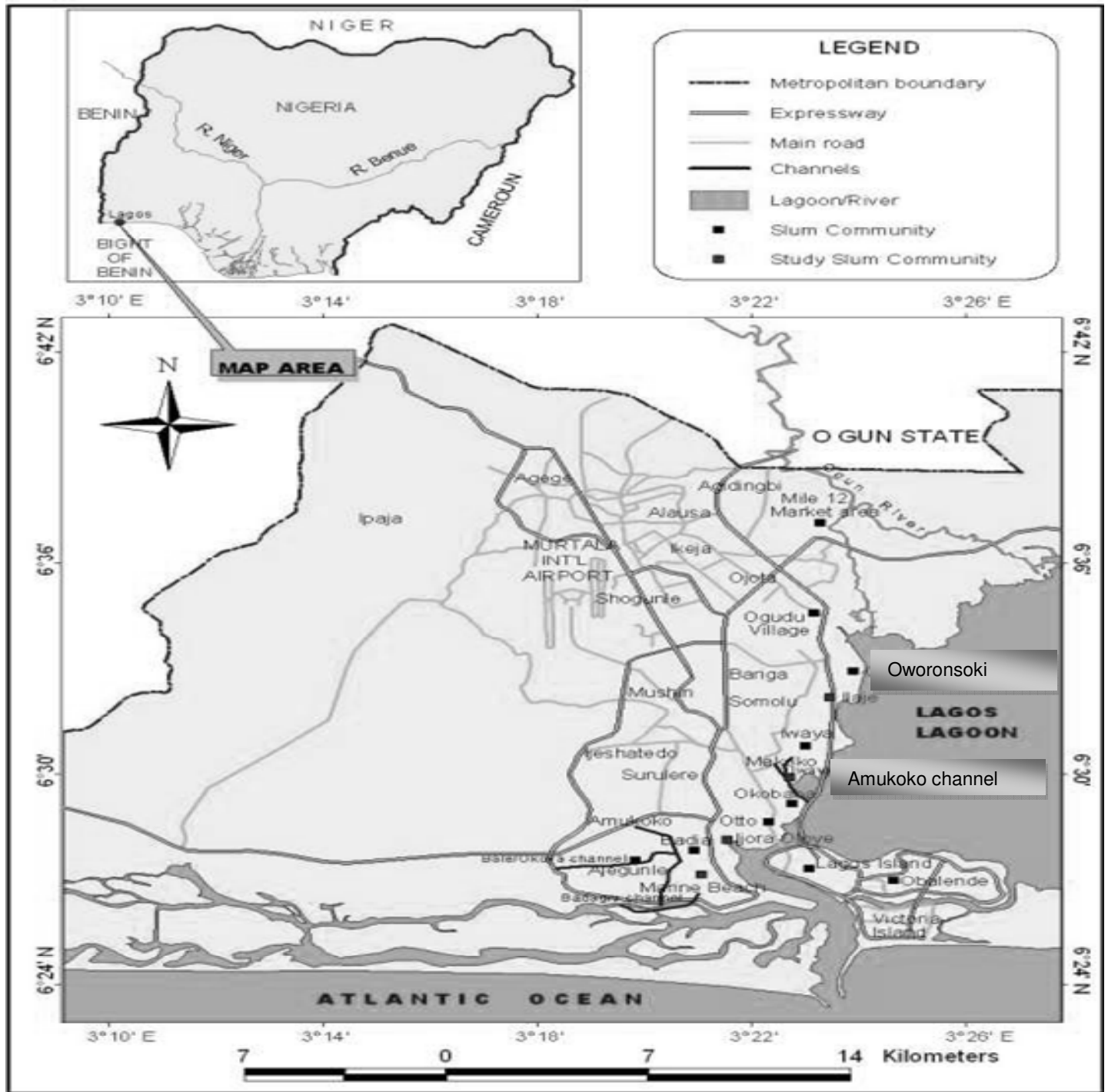


Figure 2. Slum Communities in Lagos (adapted from: Adelekan, 2009).

infrastructure in the colonialists' wealthy enclaves at the expense of the African majority (Olukoju, 1993). This, in part, led to the devastating public health crises culminating in the bubonic plague outbreaks of the 1920s, the establishment of the Lagos Executive Development Board (LEDB) and subsequent clearance-driven urban

renewal efforts.

Geographical and urban studies such as Ayeni (1977), Marris (1961) and Pullen (1966) have described the city's post-colonial haphazard expansion as exhibiting little co-ordination between employment opportunities and affordable housing. The immediate post-independence

Table 2. Population of Lagos: 1866 – 2006.

Year	Area covered by the census (km ²)	Total population
1866*	-	25,000
1901	-	40,000
1911	46.6	73,766
1921	52.3	99,690
1931	66.3	126,108
1952	69.9	272,000
1963	69.9	665,000
2006	3,345	9,113,605

Sources: Adapted from Abiodun (1997); *Ayeni (1981); National Population Commission of Nigeria (web) (Lagos State Government contested the 2006 figure).

era was also characterized by inadequate technical and administrative expertise for the management of cities (Williams and Walsh, 1968). Lagos has also been pivotal to debates that link urban governance with social and economic development, as evidenced in Olukoju (2003) and Rakodi (2002).

Two dominant approaches to analyzing and interpreting the Lagos phenomenon have been identified by Gandy (2005). First is an eschatological evocation of urban apocalypse, characterized by poverty, violence, disease, uncontrollable growth, inadequate access to water supply and sanitation, massive unemployment, and infra-structural collapse. Much of the literature on Lagos has tended to develop this outlook (See for example: Kaplan, 2000; McNulty and Adalemo, 1988; Parker, 2006; and Subiros, 2001). Adelekan (2009) recently examined the vulnerability of poor urban coastal communities to climate change in Lagos.

The second perspective is a neo-organicist approach, which draws on cybernetic metaphors of urban space to describe the novelties of the city's morphology. It emphasizes the seemingly chaotic aspects of the city's growth, but conceives these as a series of self-regulatory systems. Rather than focus on the shortcomings, it celebrates 'the continued, exuberant existence of Lagos and other cities like it', and the 'ingenious, alternate systems' which they generate (Koolhaas and Harvard Project on the City, 2001: 652).

Gandy (2005, 2006) offers an alternate contribution to the two earlier perspectives, by attempting to frame the experience of Lagos within a wider geo-political arena of economic instability, petro-capitalist development and regional internecine conflicts. A historical perspective is developed, which reveals how structural factors operating through both the colonial and post-colonial era have militated against any effective resolution to the city's worsening infrastructure crisis. Some of the causative factors of the crisis are elucidated through a succession of phases in the city's evolution. The first phase –

Colonial Lagos – was characterized by 'incomplete modernity' due to the inherited bifurcated systems of urban administration. The bustling capital of just over a million at independence soon came under severe economic and political tensions.

The second phase – the Post-colonial metropolis – evidenced initial optimism, with subsequent descent into despair, as an already unstable urban system deteriorated under the combined pressures of political instability, accelerated rates of migration (accentuated by the 1967-70 Civil war) and the destabilising effects of oil wealth. The author recalls an early upbringing in Surulere, a Lagos neighbourhood in the 1960s. Back then, there were functional public services: municipal water supply, waste collection and disposal systems, postage boxes and an effective municipal transport system. The civil war further exacerbated social divisions in the capital and contributed to a brutalization of everyday life. Lagos, which at independence was the leading industrial centre of Nigeria, from the mid 1970s onwards suffered from accelerating industrial decline. The genesis of some of the extensive slums in Lagos has been linked to the city's failed industrialisation strategy: they represent intense concentrations of human labour for which the promise of work and prosperity never materialized (Davis, 2004; UNCHS, 2004; Fapohunda and Lubell, 1978). Over time, the city began to portray a disjuncture between a facade of 'modernity' reflected in the construction of prestige projects such as the National Theatre and FESTAC town in 1977 and the city's deteriorating basic infrastructure.

The third phase saw the emergence of a succession of military regimes, interspersed with the global recession of the early 1980s, lead by the late 1990s to a near-complete break-down in the public realm, pervasive political and economic crisis and an extensive infrastructural collapse. The introduction of the structural adjustment programmes in 1986 further intensified the spread of poverty, resulting in declining levels of investment in public services and many abandoned projects (Isichei, 2002; Onibokun and Faniran, 1995). The Ministry of Economic Planning and Budget (2004) estimated a poverty level of 70 percent.

Lagos has been described as a city 'on an uncertain trajectory which differs from recognized patterns of capitalist urbanization because the city is growing rapidly in a context of economic stagnation' (Gandy, 2006). It has largely developed independently of the efforts of city planners, through a process of 'amorphous urbanism' (Gandy, 2005). The colonial state apparatus and its post-colonial successors failed to establish a fully functional metropolis through investment in the built environment or the construction of integrated technological networks. Also, corruptive consumption by political and military elites, in connivance with Western financial agents ensured massive capital flights that might have otherwise been invested in social and physical infrastructures. However, there is growing perception of a shift in policy

discourse marked by less reliance on external expertise and a greater commitment to developing local solutions learnt from best practice elsewhere.

THE IMPERATIVE OF THE LAGOS MEGA-CITY PROJECT

The available data analysed and discussed in the earlier section can be summarized as depicting Lagos as a largely spontaneous evolution in which an un-coordinated and incremental assemblage of structures gradually spread across all available space. This occurred in the contexts of historical, social, economic and political dynamics: at regional, national, metropolitan and local levels. George (2010) however identifies earlier planning efforts in Lagos; Koenigsberger-led 1964 Report on Metropolitan Lagos and LEDB's Draft Master Plan for Lagos Metropolitan Area 1965-1985. The third and most ambitious attempt by the government to capture the complexities of Lagos was the preparation of the *Master Plan for Metropolitan Lagos* – an UN-initiated strategic plan (UN, 1980); it became a casualty of military dictatorship. This signalled the end of attempts to conceptualize the city's problems in any integrated or strategic way. The subsequent rapid urban decline and brutalization of political life heralded a retreat of policy discourse into the realm of crisis management.

The re-emergence of democratic structures and institutions in the last decade holds great potentials for the resurgence of strategic planning, policy-making and their effective implementation. Undoubtedly, Lagos is on the verge of a major and radical transformation. The current Lagos State government is engaged in making a case for the Lagos Mega-City Project. However, the general misconception is that government is preparing to transform Lagos into a mega-city, as though it were a future event. Mega-cities evolve into such as they attract and accumulate human populations with skills, opportunities and avenues for advancement. What is required is to develop strategies to help transform the problematic of Lagos mega-city into the potential success it can become. This calls for recognition of the complex and multi-faceted nature of the problems involved and new initiatives to face them. The problems need to be managed and tackled in context, not just like any other city.

The reality is that Lagos by the UN standards has attained the mega-city status, yet presently lacks the infrastructural facilities, institutional and legal frameworks required to march the attendant challenges. Ironically, Lagos remains the economic and financial hub of Nigeria as more than 60 percent of total economic activities take place in Lagos State (Adejana, 2008). The idea is to transform this burgeoning mega-city into a viable and sustainable urban scheme – without inflicting injuries on its social, cultural and ecological dimensions – rather

than allow it to degenerate into a mega-slum of despair.

The Lagos mega-city region (LMCR)

The Lagos Mega-City region is identified as covering an area of 153,540 hectares – more or less the entirety of Lagos – with continuously expanding built-up area including parts of neighbouring Ogun State. FRN (2006) describes it as 'a region in crises'. The idea of the Mega-City Project is derived from the chaotic nature of urban development in Lagos State. The population pressure has been heightened by inadequate housing provision for the continuous streams of immigrants – including those from neighbouring countries.

Although the mega-city occupies only 37 percent of the land area of Lagos State, it accommodates nearly 90 percent of the population. The average population density within the LMCR is about 20,000 persons per square kilometre, compared to the national average of only 1, 308 persons. Inadequacy of decent housing has resulted in the Lagos state section of the LMCR recording 42 slum areas in 1985 and over 100 in 2006. Almost 70 percent of Lagos' population consequently live in slums (FRN, 2006). Lagos provides ample evidence that rapid growth in the context of economic decline has been a 'recipe for the mass production of slums' (Davis, 2004). The effect of these emerging slum areas is devastating, putting the corridors of land along the Lagos-Ogun State border under intense pressure of physical growth as the Lagos metropolis spills over into them, with very few indicators of real infrastructural development.

Lagos mega-city project (LMCP)

The idea of the Lagos mega city project was borne out of a two-pronged realisation: first is the projection that Lagos could become the third largest mega-city in the world by 2015 with an explosive population; second is the fact that the city had suffered severe infrastructure neglect for many decades, as discussed in earlier sections. Urban growth has occurred so quickly and in the absence of effective institutions, infrastructure and proactive planning to guide the hyper-growth. The LMCP is therefore conceived as the re-development of Lagos to fit its new urban status (FRN, 2006).

Initially the Federal Government's interventionist attempt came with the inauguration of the Presidential Committee for the Redevelopment of Lagos Mega-City Region in 2005 and the Lagos Mega-City Region Development Authority to address issues arising from the phenomenal growth of metropolitan Lagos across the border of the State into the adjoining Ogun State. Furthermore, the Lagos State government is engaged in a passionate drive to attract foreign investors to participate in the LMCP, stressing on vast opportunities to be

opened for prospective development in transportation, roads, waste management, water provision, power, tourism, property development and establishment of bus assembly plants.

Essentially the project involves providing infrastructure, mass housing and tourism, as well as developing the adjoining town of Badagry and linking it to the rest of the state with a modern transportation system. Other notable features of the proposed LMCP are:

1. Beautification and landscaping projects across the state: loops, medians along highways, setbacks and development of recreational parks in identified locations.
2. Plans for construction of new roads and a light rail road system (from Ojo to Mile 2)
3. Water routes in the state to be fully developed to facilitate marine transportation.
4. Construction of a fourth mainland bridge.
5. Construction of 10,000 housing units in the Lekki Peninsula.
6. Reconstruction and expansion of the Lagos-Badagry expressway into an eight-lane conduit with a light rail, a trans-regional route to link Nigeria and neighbouring nations.
7. A proposed ring road to link all the 28 activity centres in the state.
8. Construction of a water-way and the proposed Eco Atlantic City on the Badagry water front – “the New City on the Atlantic” – a PPP venture envisioned as a fully integrated business hub. This is to be a planned district constructed on reclaimed land, targeting 250,000 residents and 200,000 commuters flowing daily to the island, and powered by an off-grid 130 megawatts electric plant (Lagos Energy City, 2007).

URBAN SUSTAINABILITY AND MEGA-CITY DEVELOPMENT

That the government has recognised the fundamental need for infrastructural development and initiated a Project in that direction is commendable, given the earlier absence of any strategic vision to manage the urban environment in the public interest. However, to achieve the fullest potentials of the mega-city raises other issues. It has been suggested that in the cities of the developing world, the overwhelming problem is not urban growth in itself, but the fact that city administrations lack either the political will or resources to manage growth or adopt inappropriate and obsolete planning paradigms (Angotti, 1993).

Available data and literature review have revealed the inadequacy of applying conventional incremental urban planning strategies to the Lagos urban reality. For the idea of the Lagos mega-city to be enduring and sustainable, solutions must be principle-based, transcending the usual ad-hoc, isolated prescriptions. Such

conceptualizations can take a number of forms, but two interrelated strategies are proposed here: one is in terms of “Infrastructural Priorities”; the other is in terms of “Urban Essentials”. These approaches embrace earlier identified key areas of infrastructural deficiencies in the Lagos metropolis, on one hand, and the need for a multi-disciplinary, holistic perspective on the other. Abiodun (1997) and George (2010) identify similar infrastructural priorities as the following:

Infrastructural priorities

These are physical and social infrastructures that represent key areas of action:

1. Housing: Provision of affordable and adequate housing.
2. Civil construction: Road redesign, construction, upgrading and rehabilitation.
3. Transportation: Integrated transportation systems and traffic management.
4. Urban design: greening, landscaping, open space beautification, recreational facilities.
5. Waste disposal and functional drainage systems to prevent flooding.
6. Health care delivery: at the primary, secondary and tertiary health care levels.
7. Potable water supply and environmental sanitation.
8. Security of lives and property.
9. Energy and regular power generation, distribution and supply

Adequate levels of infrastructural facilities with appropriate supporting social services are a prerequisite for any meaningful programme of sustained industrial and commercial development of Lagos (Abiodun, 1997). However, urban planning does not automatically equate physical planning; physical planning is seldom free from social implications. There is evidence to suggest that the core problems of the city are social (Palen, 1975). Ironically, the conventional response is to attempt to provide only engineering solutions for urban problems based on the naïve belief in the liberating power of technology.

Urban essentials

Based on earlier analysis, this study finds applicable some guiding principles, which Hall and Pfeiffer (2000), based on the analysis of the World Commission URBAN21 and its expert group, describe as ‘Dimensions of the Sustainable City’. These ‘urban essentials’ represent the most fundamental concerns of sustainability and illustrate its inherent multi-dimensionality. To be sustainable, a city must score on virtually all fronts. The

particular analysis of Lagos highlights the significance of each of these dimensions of sustainability:

Sustainable urban economy

Work and wealth (as against poverty, unemployment, hunger, poor health etc). The acute poverty and social polarisation within Lagos presents a threat to rebuilding the social and physical fabric of the city. A sustainable economic strategy would therefore take cognisance of the vast expansion in the vibrant informal economic networks that presently sustain everyday life in the city.

Sustainable urban society

Social coherence and solidarity (as against social and political exclusion). The idea is to ameliorate the current intense social polarisation and spatial fragmentation in which households attempt to provide all of their own services (water supply, power generation and security), leading to a 'self-service city' in which little is expected from government. The identification of commonalities which transcend present patterns of polarisation would enhance the task of developing new and more legitimate modes of public administration (Gandy, 2006). A sustainable urban society would synergize public, private and popular inputs for the good of all.

Sustainable urban shelter

Decent affordable housing for all. The city now has the advantage of a larger pool of built-environment professional expertise than in earlier decades, who can contribute to effective housing policy-making and sustainable implementation, management and main-tenance, as they relate to urban housing issues, whether in the public, private or popular housing sectors.

Sustainable urban environment

Stable ecosystems. A major area of concern is the vulnerability of poor coastal communities to the flooding problems of Lagos, due to inadequate drainage network, and accentuated by climate changes (Adelekan, 2009).

Sustainable urban access

Resource-conserving mobility. Studies have shown the futility of urban sustainability that does not address automobile dependence; when an urban area assumes automobile use as the dominant imperative in its decisions on transportation, infrastructure, and land use

(Newman and Kenworthy, 2003).

Sustainable urban life

Building liveable city. The kind of vibrant, cosmopolitan ideals promoted at independence have been replaced by a context where social and economic relationships are in a constant state of flux and uncertainty (Simone, 2004). The present realities of Lagos depict a fragmentary, polarised, unstable urban space.

Sustainable urban democracy

Empowering the citizenry through participatory approaches. The emerging democratic culture since the return to civilian rule are yet to facilitate the emergence of urban 'citizens' as opposed to mere 'inhabitants' with little stake in the city's future. Part of the challenge of Lagos is to articulate itself as a city in a way that transcends the multiplicity of sectional interests sharing urban space.

The above sustainability principles underline the multi-disciplinary demands of the mega-city phenomenon. They do not however diminish the value of the design disciplines (Architecture and Urban design/Planning) in the realm of sustainability, as these remain relevant with regard to the aesthetics, functionality, morphology and urban quality of the mega-city. In the absence of strategic urban design and planning, the city's disadvantages will become graver. When based on emerging participatory paradigms, these disciplines can make significant contributions towards sustainability, by improving the city's form and making it more people-friendly; in short, enhancing the city's advantages and diminishing the disadvantages (Carmona et al., 2003; Carmona, 2001).

RECOMMENDATIONS

In the long-term, not only technological development but also better-informed urban policy-making and management can help to mitigate several of the problems of mega-cities. The latter can safeguard and improve the living conditions in mega-cities of the developing countries where urban growth appears inevitable. Experience of countries such as China has shown there is greater wisdom in strengthening the economic functions of mega-cities, than in adopting measures of deconcentration (Jones and Visaria, 1997). Significant as the growth of mega-cities is, it is perhaps better to concentrate not on the 'fear of size' but on synergy of form, flow and function. Gandy (2006) posits that panoply of institutional reforms is critical to any improvement in urban conditions. Based on the author's disciplinary platform (architecture and urban design), the following recommendations, related to two key areas: (1) Housing

(2) Transportation and Urban Renewal are offered.

Housing

Housing holds a significant position in the Lagos Mega-city reality. The conventional wisdom includes: slum upgrading strategies, using participatory approaches; mortgage-based home-ownership schemes; site and services programmes; private sector estate development; policies which promote multi-storey residential development; and phased urban neighbourhood renewal. These additional recommendations could be considered:

1. A compilation of the existing body of research findings in housing issues in Lagos.
2. Detailed demographic, quantitative and qualitative evaluation of the present state of housing in Lagos (in terms of urban residential morphology, housing types, needs and conditions, forms of tenure, occupancy rates, and affordability) as basis for accurate projections and input for periodical "State of the City" reports to guide development.
3. Identification and designation of urban priority areas (locations) that require urgent and special developmental attention.
4. Preparation of neighbourhood residential and mixed-use design guides, and flexible layout plans which emphasize the importance of places, above vehicular movement.
5. Self-help projects through micro-credit and cooperative systems are initiatives that should originate with the actual slum dwellers.
6. Core public housing projects that do not end up as 'elitist estates' for the wealthy.
7. Community inclusion and citizen participation in planning and managing the mega-city. Planning within the dynamics of mega-cities must accommodate a high level of complexity and uncertainty; and therefore flexible and adaptable.
8. Ineffective, restrictive institutional frameworks for planning need to be overhauled, re-oriented and revitalized to meet the fresh challenges of the mega-city era.

Transportation and urban renewal

According to Abiodun (1997), Lagos until 1981, had no urban transportation plan; road networks were laid out incrementally in specific areas as they became incorporated into the built-up area of the city. The identified three-fold problems of transportation in Lagos are: institutional, inherent physical characteristics, and social/human problems of traffic control. Planning an affordable and sustainable transport system accessible to all population sectors is therefore a major challenge.

These recommendations are considered useful:

1. Organizational, technological and engineering strategies to deal with the traffic will include opening up traffic bottlenecks, re-routing, and widening of roads.
2. Highway planning in residential areas should not only ensure safety and vehicle flow efficiency, but also assure environmental quality and pedestrian permeability.
3. Social and cultural re-orientation of the citizenry towards the virtues of non-motorized modes of movement, aimed at reductions in traffic congestion and pollution.
4. The development of pedestrian-friendly, integrated transport management systems such as Mass Rapid Transit Systems (MRTSs) and Light Rail Transits (LRTs).
5. Revitalizing the inner areas of the mega-city through people-sensitive urban renewal, and transit-oriented, mixed development, pedestrian-friendly land-use (Frey, 1999).
6. Discouraging urban sprawl through effective growth management strategies, such as mini-green belts, urban buffers and the provision of sub-centres for existing suburbs.
7. Improved local adaptation of existing clean technologies; in many instances local, culturally adapted and low-cost technologies offer viable solutions.
8. Greater application of Geographic Information Systems (GIS) and remote sensing technology to monitor the rapidly growing city for better informed policy making, spatial planning, land administration, and infrastructure development (Osei et al., 2006).

Conclusion

This paper has discussed the issues of mega-cities and urban sustainability, situating these within the practical and pressing context of Lagos mega-city. It examined the global emergence of mega-cities, reviewed literature related to urban sustainability, the challenges of mega-cities in general and the context of Lagos as a particular case-study. The available data from archival sources, researcher-observation and the literature depict Lagos as a largely spontaneous evolution in which an un-coordinated and incremental assemblage of structures gradually spread across all available space. The Lagos Mega city Project is thus justified as imperative. Specific infrastructural priorities and sustainability dimensions were presented as tenable responses to the challenges. Recommendations relating to housing, urban renewal and transportation were offered from an urban designer's perspective.

However grandeur the dream of a Lagos Mega city Project, government should fully appreciate the immense urban issues (subsisting and consequential) that are impacted. The LMCP would benefit from continuous injection of new ideas, experiences, and research

endeavours. Apart from the issue of sustainability, other related areas of further research on mega-cities may include: morphological issues; the implications of globalization and the informational revolution for mega-cities of the developing world; urban management and governance issues; and climate change. Mega cities are extremely complex systems and solutions to their problems require integrated approaches. It is therefore expected that stakeholders will engage in greater synergy on the future of Mega-cities.

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