

# Stakeholders' and sustainability considerations for mega infrastructure projects: A case of Accra Airport City Project, Ghana

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## ABSTRACT

Studies have revealed that stakeholder management and sustainable principles consideration are essentials for mega construction project success. The aim of this paper was necessitated by the fact that though there is stakeholder dissatisfaction and lack of studies on the sustainability of the Airport City Project (ACP) Accra, there is a proposal for second phase development. This paper evaluates stakeholders' and sustainability measures considered for the ACP's long term sustainability. A mixed method approach and purposive sampling was adopted. The 70% quantitative survey response rate was validated using six (6) semi-structured interviews and data analysed using a descriptive survey method.

Key findings indicate that peer review of designs, project stakeholder meetings, project approval in principles and development monitoring were the measures instituted for stakeholder and sustainability considerations rather than the entire stakeholder management process. The research concludes that the ACP is only medium term sustainable due to low level stakeholder consideration, services infrastructure development, high vehicular traffic congestion, high rental values, socio-economic and cultural factors which are challenges for long term project sustainability.

**Keywords:** Airport City Project, stakeholders, stakeholder management, sustainable development

## 1.0 Introduction

Accra, the capital city of Ghana has seen major infrastructure development during the past decade transforming it into a modern city towards the realization of the 'Gateway to West Africa concept.' The physical manifestation of this concept is the sprouting of splendid architecturally-designed high rise glass buildings, magnificent structures and road networks in the city but more conspicuous is the infrastructure developments within the vicinity of the Kotoka International Airport (KIA), stunning for the eyes to feast and developed as the ACP, Accra (Modern Ghana, 2013). ACP Accra, unlike many projects in the city which are small scale, sprawling or isolated high rise developments in nature has about 40 high rise projects of competing height, architecture and functions located in the same arena and conspicuous along the airport and airport by pass roads.

According to the Properties Manager of Ghana Airports Company Limited (GACL), the site belonging to the Ghana Civil Aviation Authority (GCAA), was redesigned in 1996/97 as part of the Accra Redevelopment Scheme with a modern urban development concept in realization of the 'Gateway Concept'. The ACP Accra enclave has about 40 developers, at 80% completion stage, entails large, complex and major projects which are described by different terms but can be referred as mega construction projects (Ruuska et al., 2009; Grun, 2004; Flyvbjerg, et al., 2003). Though several descriptions are given to the project including large scale, large size and complex projects,

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fundamentally, they are huge investment projects aimed at supporting governments in achieving their social and economic development objectives (Othman, 2013), and attracting public and political attention due to their substantial impacts on communities, environment and budgets (Van Marrewijk et al., 2008; Capka, 2004). Othman (2013) and He et al., (2015) state that mega construction projects are usually complex in nature. Evaluating and understanding these complexities becomes critical to the success of such projects which entails huge contract sums, number of participants, technical and managerial competences, significant social and economic impacts, extensive works and closely connected to other major developments.

The ACP, Accra includes hotels, shopping malls, residential apartment, corporate office blocks, multi storey open space rental tower buildings, restaurants, banks and insurance companies. The different types of projects, scale, complex nature and numerous stakeholders involved in these projects leads to several factors impacting on the project success namely, technological, organizational, environmental, cultural, goal and information complexities (He et al., 2015) numerous and disgruntled stakeholders (Eyiah, 2015a). Guangshe et al., (2011) suggests that mega projects have close connections with globalization and could be the outcome of social conflict having close relationship with economic development. The economic development objective of the project can thus be achieved if the project is sustainable and successful.

Among the major factors in determining a project success is meeting stakeholder satisfaction and needs (PMI, 2013). It is imperative that the ACP therefore meets stakeholders' expectation to ensure project sustainability. Several researchers including Morris and Hough (1987), Nijkamp and Ubbels (1998), and Flyvbjerg et al. (2003), have studied a large number mega construction projects and found that such projects often fail to meet expectations and agreed goals notably deadlines, budget and specified quality usually linked to problems in planning or executing activities within a project. It is useful exploring the success of the ACP Accra before the proposed phase 2 is implemented. Considering stakeholders concerns, the project may not deliver what the users need; hence impacting on sustainability (Frame, 1987; Kreiner, 1995). The failure may be attributed to the numerous stakeholders involved and failure to manage stakeholders as in the case of GETFund projects in Ghana (Eyiah, 2015a).

The ACP Accra with over 40 developers involve a wide array of stakeholders whose interests and demands need to be considered in the managerial decision-making, for project sustainability and success (Cleland, 1986; Diallo and Thuillier, 2005; Olander and Landin, 2005). It is expected that project managers should consider the interests of the many stakeholders involved and adopt an effective stakeholder management process through a process of identifying stakeholders, roles and responsibilities, interest, affect or affected (Freeman, 1984), legitimacy, power and urgency (Mitchel et al., 1997) to impact on the project outcome. Yang et al. (2011b) states that in MCPs, project managers often face challenges in the processes of identifying stakeholder and their needs, assessing stakeholder impacts and their relationships, and formulating appropriate engagement strategies to meet their needs. This situation is worse considering the numerous developers and competing interest, diverse project stakeholders and their actions affecting sustainability considerations from one project to the other. The dissatisfaction of some stakeholders and the call for stakeholder consideration assessment is justified.

Research has also confirmed consideration of sustainable principles such providing clean atmosphere, efficient energy utilization and sustainable sites are necessary for project success and that effective management of these mega-projects relies on three key concepts of early planning and organizing,

stakeholder communication and project controls integration, and continuous improvement (KPMG, 2013).

Further studies have shown that mega construction projects MCPs undertaken in developing countries impact on the environment, culture, social and economic growth of the nation at large. Ugwu and Haupt (2007) suggest that in addition to the internationally recognised sustainability major metrics of economy, environment and society are project management and resource utilization which involves project key stakeholder roles. Designers as key stakeholders have a responsibility to consider environmental impacts, innovative solutions, optimised usage of resources including, design durability, constructability, material reuse recycle and waste management in addition to innovative construction methods and technology. These projects mega in size and cost, have numerous stakeholders with diverse interest (Mok et al, 2015), high risk undertakings that consume substantial amount of time, cost and requires highly trained construction industry professionals and skilled managerial team (Othman, 2013).

According to PMI (2008), projects are temporary endeavours undertaken to create unique product, service or result with definite beginnings, end times, cost and performance parameters. Eskerod and Jepsen (2013) state that carrying out a project as planned is not a guarantee for success and that project may fail because project managers do not take the requirements, wishes and concern of stakeholders sufficiently into account. Stakeholder management as a project management tool may be a challenge for many project managers in Ghana since much emphasis is not attached to stakeholder management, the many approaches to stakeholder management and the numerous stakeholders involved in the project execution. There is lack of studies in stakeholders' and sustainable principles consideration in mega infrastructure project delivery and long term sustainability for developing countries. This paper therefore assesses stakeholders, sustainability consideration and the long term sustainability of Accra ACP development. To achieve this, the specific objectives considered were to explore: (1) key project stakeholders, roles and consideration process in the project development; (2) sustainability considerations; and (3) the project sustainability in relation to stakeholders and sustainability considerations.

## **2.0 Literature review**

### **2.1 Airport City Project, Accra**

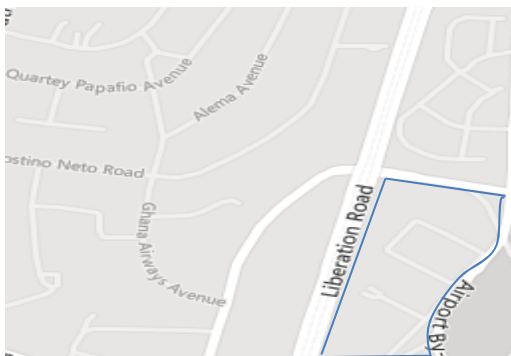
The Gateway to West Programme was a major government of Ghana policy to create the enabling environment to attract investment in the late 90's. According to an interview with the chief executive officer of Ghana Civil Aviation Authority (GCAA) in 1999, the airport city project, Accra is one of the many projects that the government of Ghana embarked on to enhance the Accra-Tema area in 1998 to give the right impression to visitors and those who wanted to stay in Ghana as part of the Vision 2020 plan and also to encourage quality business away from the central business district (Forbes, September 1999). The GCAA plans as landowners was to develop the 40 plus acre site in front of the airport as the 'Airport City Project' by developing the roads, communication facilities, power distribution, lighting, water supply, sewage treatment, parking lots, landscaping, drainage, walkways, utilities as site and service scheme and let out to private developers due to financial constraints. This agrees with Othman et al (2013) assertion that development projects are undertaken by government for specific interventions but are constrained by financial resources.

The 40 acre site is bordered at the north by the Airport road, east by airport by-pass road, south by the north liberation road and the west by the liberation three-lane carriage road with only two exits from

the airport single lane by-pass road. The envisaged investment is a complex of hospitality industry, hotels, shopping malls, offices, parking and recreational areas (GCAA, 1999) and by linking these several complex projects can be conceived as mega construction projects (Othman, 2013; Mok et al, 2015). Hannan (2012) quotes Robbins (2014) and Scott et al. (2006) as raising the question of the long lasting benefits of such mega construction projects in the interest of the entire citizen and its conception as part of urban redevelopment scheme, planned to link project with the city centre and urban transportation system. Mok et al., (2015) state that such mega projects have numerous stakeholders with diverse interest and cultural influence on the project outcome.

The three major questions raised are:

- Who are the project stakeholders and their interest?
- How are the project stakeholders, interest and influences managed?
- What are the project sustainability considerations?



**Plate 1** Layout showing Airport City location



**Plate 2** View of Airport City Project, Accra

## 2.2 Stakeholders

According to Freeman, (1984) stakeholders are “groups or individuals who can have effects on, or are affected by, the objectives of an organization or those who are, or could be, influenced by an organization (Kolk and Pinkse, 2006). Stakeholders have vested interest in the success of a project and the environment within which the project operates (McElroy et al, 2000) and most important is the widely acceptance that stakeholders have a claim or interest in a project and its activities (Nguyen et al., 2009). Considering the initial 100 interested investors alone (CEO GCAA, 1999) gives an indication of a high stakeholder interest. The project stakeholders thus include the government, the GCAA as client, client organization, project sponsors, developers, project team project manager, consulting architects, engineers, quantity surveyors, specialist designers, contractors, sub-contractors), facility users (financial institutions, office staff, shoppers, holiday makers), suppliers, statutory bodies, utility service providers, road users, air travellers, investors and pedestrians (Newcombe, 2003; Olander and Landin, 2005a; Atkin and Skitmore, 2008; Yang, 2010, Heravi et al, 2015). Though there are several stakeholders, some are primary and others secondary related to the project hence have different levels of impact and consideration (Clarkson, 1995; Calvert, 1995; Winch and Bonke, 2002). Newcome (1996) suggests that project managers usually will consider the project client or developer as the only stakeholder of importance though there is the tendency of a negative impact by others if considered not beneficial. This paper therefore assesses the stakeholder management process and impact on the project sustainability

### **2.3 Stakeholder Management (SM) and Mega Construction Projects**

Bourne and Walker (2005) state that stakeholder management (SM), is an effective approach of bringing stakeholder concerns to the surface and developing robust stakeholder relationships in complex project environments. Young (2006) agrees and suggests that SM should include identifying stakeholders, gathering information about stakeholders and analysing the influence of stakeholders which should consist of a systematic approach (Lock, 2007). Making conscious effort is an essential part of project management for projects of this scale and with several stakeholders considering the objective of SM which seeks to ensure a successful project delivery by considering stakeholder interests, needs, influence, and conflicts while enhancing stakeholders' contribution and roles. Cleland (1986) and Jergeas et al. (2000) stress the need for efficient management of the relationships between the project and its stakeholders as an important key to project success". SM therefore has a major role in the long term sustainability of the Accra Airport City project.

According to scholars, the challenges to project managers are the identification of all stakeholders involved and the best approach to stakeholder management for effective impact on mega construction projects with stakeholders of diverse interests (Chinyio and Akintoye, 2008, Yang, 2010, Mok et al, 2015). Researchers have identified tools for analyzing effective management of stakeholders to include Stakeholder Matrix (Chinyio and Olomolaiye, 2010; Newcombe, 1996), Stakeholder Circle Tool (Bourne, 2005), Social Network Analysis (Bourne and Walker, 2006; Rowley, 1997) which is necessary for sustainable project development in developing countries since MCPs impact by contributing to value addition to society economically, culturally, socially and environmentally (Barrett and Barrett, 2006). Earlier research has shown that some stakeholders in developing countries only consider aspect of SM, rather keeps mental record than documentation of the process (Eyiah, 2015). The paper assesses stakeholder consideration and impact on long term sustainability.

### **2.4 Mega Construction Projects (MCP) and Sustainability**

The Airport City project by virtue of the site coverage of 40 acres, the over 40 projects currently being developed, complexity and cost qualifies it as a mega construction project (Othman et al, 2013). Research has identified that MCP's development can be controversial, raising several questions on the long term benefits to the people and community as envisaged (Hannan, 2012; Robbins, 2014; Scott et al., 2006) due to the diverse interest which in some instances are political. There has been several researches on sustainable development and in construction since the (Bruntland Commission Report, 1987), because construction projects such as roads, dams and housing developments by their scale and site coverage naturally cause a lot of environmental damages and ecological instability. The Airport City Project is not exceptional since the hitherto green area with water bodies have turned into brown paved areas. Though construction projects are seen as intervention for socio-economic development, maintenance of the capacity of ecological systems to support social and economic systems (Berkes et al, 2003) is required, implying avoiding practices which appear to be acceptable in the short term, but which, in reality, undermine future possibilities (McGranahan, Songsore, & Kjellén, 1996). Thus sustainability, or sustainable development, has emerged as a normative concept to address environmental crisis. Sustainable development promotes the integration of economic, social and environmental concerns within policies and strategies, paying to the integrity of nature, well-being of the people and environment (Gibbs et al., 1998; Hopwood et al., 2005) The Environmental Protection Agency is the body responsible for environmental sustainability and a major stakeholder in this project realization.

According to Othman, (2013), case studies and analysis carried out confirmed many of the challenges identified in literature relating to MCPs and sustainability impact on developing countries which were classified under (1) engineering design and technical challenges, (2) environment, society, economy and policy, (3) client performing organisation and (4) project nature and objectives. The Leadership in Energy and Environmental Design LEED, advocate for sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality as measures necessary for building sustainability. These factors are critical when considering MCPs due to their scale and impact on the environment. The paper assesses the project in the light of these and other factors.

Sustainability can be achieved as a long-term solutions to meeting community needs but requires involving multiple community partners in the planning process, using local materials equipment and technology when possible, identifying a local funding source, providing training and education, motivating beneficiaries to take ownership, monitoring and evaluating project objectives (Rotary, 2012). Barrett, (2006) suggests that sustainability can be achieved through constraints driving, collaboration and creativity which eventually lead to community benefits. The need for stakeholder management role for enhanced MCP sustainability and project delivery cannot be over emphasized hence the assessment of sustainability considerations and impact on project long term sustainability.

### **3.0 Research Design**

To achieve the research aim and objectives, a mixed-method research survey was considered which consisted of (1) literature review (2) quantitative survey validated, using (3) semi-structured interview. A purposive sampling involving key stakeholders involved in the Airport City Project was used. Fifty questionnaires were administered with a 75% return rate which was followed with semi-structured interview of six key stakeholders. Themes and objectives were developed around the three research questions formulated as; “who are the project stakeholders and their role in ensuring sustainability of the project?”, “what are the sustainability principle considered by the key project stakeholders?” and “whether the airport city project is sustainable in Ghana?”

Firstly, there was a comprehensive background buildup of the research topic including (1) stakeholder, stakeholder management (2) Airport city project and developing countries nature and characteristics (3) Mega construction projects and sustainability approach. This approach mainly through extensive literature review on stakeholder management, mega construction projects and developing countries from academic journals, text books, conference papers and news articles assisted the researcher with information on various stakeholders involved in MCPs, stakeholder management processes, sustainable principles and sustainability considerations used in preparing the set of questionnaire. Interviewing further six key stakeholders; two project managers, architects and developers each validated or otherwise key stakeholders’ perception of the sustainability of the project from literature and the quantitative data. The Airport City Project considered included large shopping malls, multi-storey mixed-used apartment blocks, multi-storey hotel, apartment and commercial development.

### **4.0 Findings and discussion**

#### **4.1 Airport City Project Development**

An interview with the Ghana Airport Company Limited (GACL) architect revealed the company’s satisfaction with the project development and the plan underway to develop a business center (GACL website). The project at about 80% complete has all major projects completed or at various level of

completion except the airport city hospital complex yet to commence. The study considered one each of the different types of projects developed at the enclave namely: hotel, office tower, shopping mall, bank and mixed-use development in relation to stakeholder management and sustainability principles. The projects are the Silver Star Tower, 3-Star Holiday Inn Hotel, exquisite UT Bank, One Airport Square (a mix commercial), Marina Shopping Mall, SSNIT Emporium adding to the elegant spectacle of the Airport City and the 13-storey complex with a revolving restaurant at the summit, cinema halls, retail outlets and offices selected due to their complex architectural design, availability of information or public interest. Stakeholder and sustainable development considerations for the overall project, individual projects, and needs of interested or affected individuals, groups and simultaneous devotion to economic, social and environmental goals for sustainability were explored.



Plate 3; Marina Shopping Mall



Plate 4; Holiday Inn Hotel



Plate 5; SSNIT Emporium

The Marina Shopping Mall is a dual commercial development owned by Marina Market, a daughter company of Marina Group in Burkina Faso, 9000sqm area, has over 45 outlets, spread across three floors and one of the four shopping malls in Accra managed by Broll Ghana, the others A&C Square (10,000sqm) Accra Mall (20,000sqm) and the West Hills Mall (27,000sqm) in Weija-Accra ([marinamallghana.com](http://marinamallghana.com)) The mall was opened in 2012 in the multi-purpose shopping and office hub at the Airport City enclave, serves as a hangout, meeting place during week ends and the success of it attributed to the growing middle and upper class income group in Accra as a result of the economic growth of 14% in 2007 and desire for people to shop in a modern environment ([modernghana.com/news](http://modernghana.com/news)). The Holiday Inn, Hotel is part of the African Sun group well located for the business traveller or adventurous tourist with 168 appointed rooms. It has the Wiase Restaurant, overlooking the sparkling pool and the La Cabona Pool Bar. The SSNIT Emporium on the other hand is a corporate ultra-modern office complex, has a main building and a tower with about 15,400sqm, biggest commercial office space in Accra, well sited, aesthetically pleasing designs and greenery and belongs to the Social Security and National Insurance Trust with several estate developments in Ghana.



Plate 4; One Airport Square



Plate 5; Silver Star Tower



Plate 3; UT Bank, Manet Towers

The airport city project cannot be mentioned without the One Airport Square project, which has an outstanding architectural traditional character, nine floors of office space and 2000sqm retail space designed by the award winning sustainability architect Mario Cucinella. The Silver Star tower has

been the banking halls for Ecobank Ghana and Stanbic Bank for several years. In addition, there are commercial office spaces, showroom for Japan motors, owners of the property and restaurant. The UT Bank is located in one of the Manet twin towers at the Airport city arena with a box-like glass curtain wall, double volume columns with arches and open floor office design.

## **4.2 Stakeholder Management**

Researchers have suggested that stakeholder management should be a process entailing stakeholder identification, assessment, engagement, analysis, planning and monitoring (Cleland, 1986; Mitchell et al., 1997; Elias et al., 2002; Bourne and Walker, 2006). The study revealed that the complex and mega nature of the project resulted in the involvement of numerous stakeholders with different cultural backgrounds with interest or had their interest affected by the project outcome which agrees with literature (Mok et al., 2015). There were notably Italian, German and South African as well as local Ghanaian architects as the project designers or partners with different cultural backgrounds impacting on the design concepts as well as project managers and contractors. The project supply teams were not different hence several individual and stakeholder firms were involved in the project. Project managers had hectic task of identifying the several individual and groups with stake in the project development: project managers, project teams, consultants, site personnel, contractors, subcontractors, supply chain, statutory approval bodies, end-users and professional bodies (Newcombe, 2003; Ward and Chapman, 2008; Chinyio and Akintoye, 2008).

The study further revealed that stakeholders mainly considered by project managers and designers were the project team members, primary stakeholders who had interest in the outcome of the project. In addition project client, land owner, project sponsor and identified end-users interests were the main consideration with the client as the top most priority. This agrees with the assertion by Newcombe (1996). Significantly missing was consideration for stakeholders affected by the project; public and politicians (Mittelman, 2000) and those who were benefitting from the undeveloped land; vegetable farmers, labourers (squatters), road users, individuals and businesses firms daily using the adjacent Air Cargo warehouse affected by the project outcome but had little legitimacy and power (Mitchell et al, 1997) though literature suggests the need for their consideration. Equally, the media, politicians, and local community were less considered. Stakeholder identification for the Airport City Project was therefore not; rigorous, entirely considered, at the project planning stage confirmed by the absence of stakeholder identification register. Thus, much as individual project managers identified their internal and primary stakeholders, other external and secondary stakeholders with interest and affected by the project outcome were ignored, this affecting the entire stakeholder identification process.

Stakeholder meetings and engagements were mainly project meetings, engagement with the GCAA or the GACL (landowners) and project team's organisations. This basically confirms literature that many project managers consider only the interest of the client and client's organisation (Freeman, 1984; Newcombe, 1996). Beyond the project team the other stakeholder mainly considered were the statutory bodies responsible for approval, the Accra Metropolitan Authority (Building Permit), Town and Country Planning (Development Permit), stakeholder committee set up for approval in principle (AIP) and the utility providers as and when their services were needed (Chinyio and Olomolaiye, 2010). Peer review of designs were highly considered at the professional level but not aimed at stakeholder engagement except when designs evolved out of completion.

The approach to stakeholder consideration was in contrast to SM process suggested by scholars that project stakeholders need to be identified at the beginning of the project and their interest considered



from the initial planning through to the final operation and maintenance since stakeholder expectation can affect or be affected by the outcomes both negatively and positively the implementation of the project (Olander, 2007). Project managers agreed with scholars on project stakeholder as; client, project management team, consultant and design team, contractor, subcontractor, supplier, employees, local communities, funding bodies and government authorities as stakeholders whose interest needed to be consideration but ignored the local community, some end-users, media and politicians who had interest or were affected by project outcome (Olander and Landin, 2005a; Newcombe, 2003; Atkin and Skitmore, 2008).

Stakeholder Management SM process was not fully considered. The approach adopted for the Airport City Project was largely client and known end-user consideration thereby maximizing the utility of the developers firm in terms of profit and growth (Smyth, 2008). Scholars have suggested that for effective SM process it is essential that stakeholders are systematically identified, engaged, analysed, planned and monitored (Lock, 2007, Yang, 2010). Cleland and Ireland (2002) suggest that SM approach should be formal. In the absence of formal identification process, project managers adopted different approaches to managing the project team members and identified end-users with SM process not fully carried out for entire stakeholders. The approach seems to agree with the suggestion by Karlsen (2002), Chinyio and Akintoye (2008) that no formal approach exists in real projects or has been fully developed with regards to developing countries (Yang, 2010) hence there is selective consideration and different approaches adopted. It is not surprising that some stakeholders are dissatisfied with the absence of parks, pedestrian walkways bus stop or taxi ranks.

The research further identified that in the absence of formal identification, stakeholder types and influences were not considered. Stakeholder roles were rather considered for project team members and stakeholder engagements in the form of project site meetings, progress meetings or arranged as and when necessary. The client traditionally was considered (Newcombe, 1993) regarding power, legitimacy and urgency (Mitchel et al, 1997), mostly monitored and well informed by the project team. There was lack of monitoring of other stakeholders in the absence of the formal process, the reason behind poor utility services development as GCAA failed to developed the needed infrastructure including car parks and widening the carriage way.

Three things were evident: (1) some important stakeholders like the local community and government agencies were not considered, (2) SM consideration was only at the initial stages of the projects and that (3) there was absence of records showing SM process for the entire project development except the project teams' individual informal approach for their key stakeholders and the specific projects. A careful SM consideration for the entire project could have created the necessary stakeholder needs such as common landscaped open spaces for a vibrant culture, where a diversity of social, recreational and economic activities can take place, safety, security and car park provision to meet stakeholders need necessary for the sustainability of the project. It also confirms that SM approaches is subject to national context of the project and at best traditional stakeholder analysis techniques is adopted notwithstanding their weaknesses (Mok et al., 2015).

### **4.3 Sustainability considerations**

The research explored sustainability considerations for the ACP as mega construction project with sustainability implication and required simultaneous attention, devotion to economic, social and environmental goals (De Brucker et al., 2013). Sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality as measures necessary for

building sustainability were in addition considered (LEED) with these factors seen as critical when considering mega projects due to their impact on the environment. The Airport City Project site until its development had water bodies, greenery, was eco-friendly and environmentally sustainable.

#### **4.3.1 Creation of an urban regenerated city**

According to the CEO, GCAA (1999), the site had been redesigned for urban regeneration scheme. This was confirmed by the GACL properties manager (Modern Ghana, 2013) who reaffirmed the modern urban development concept, the expansion of the airport business portfolio perceived as outlets for economic growth such as promotion of trade and employment generation. This objective appeared to have overshadowed the need for consideration of sustainable principle as the Airport City is seen as an arena with brisk business, social and economic created by the presence of the Vodafone Offices, Silver Star Tower, 3-Star Holiday Inn Hotel, UT Bank, One Airport Square, Marina Mall and the SSNIT Emporium. Economic and social activities mainly banking, financial transactions, telecommunication, hotel business and shopping is brisk, second only to the Central Business District in Accra and confirming the project's objective. The Airport City Project thus serves residents in the central and north eastern suburbs of Accra, visitors and airport staff but lacking vibrant culture though Hannan, (2012) has suggested the need for creation of vibrant culture.

This high rise development is in response to the liberal urbanism with characteristics of globalization, strong effect on urban densities and environment (Roberts et al., 2009) however uncharacteristic of urban design as it lacks open spaces and greenery. There is no outdoor recreational spaces provision for the local community and the general public, a situation which hinders local community ownership of the development. The green ecological area has become brown with paved grounds for car parks and the sprawling development suddenly vanished, a situation which has become a major concern to stakeholders.

#### **4.3.2 Environmental, cultural heritage consideration and sustainability**

The research identified that environmental and cultural heritage consideration necessary for the project sustainability are virtually missing. The designs of the office blocks, shopping mall, hotel and the mixed commercial high rise buildings do not manifest the traditional architectural character and concepts that enhances social interaction and usually considered for the tropics. The One Airport Square project is outstanding in terms of architectural character environmental consideration. It adopts the traditional courtyard concept, raises the floors on columns to enhance airflow and create space for social interaction. The Una Mall, ground floor of the UT offices however depicts some traditional architectural characters.

The usual courtyard designs with long overhangs, creation of terraces and balconies were missing together with the lack of attempts to preserve any cultural heritage in the form of buildings (Gounden, 2010). The design and the environment created exclude the benefits of the poor in society though developers have benefitted from the government resources by not providing for social infrastructure for the poor, a cultural heritage which is found in the local communities (Hannan and Sutherland, 2015). Corner shops, local eating areas, playing fields for recreation pedestrian access are just not available which was attributed to the non-engagement and participation of city residents in the planning and design. There are virtually missing the use of local materials such as bricks both for walls, as facing material, clay roofing and wall murals which are commonly found in several parts of

the country especially northern Ghana. Most of the architectural designs can only be considered as foreign and lacks cultural heritage for sustainability.

#### **4.3.3 Mega construction projects (MCPs) and sustainability**

Research participants agree with the researcher that the Airport City Project can be assessed as a mega construction project considering the scale, complexity, size, cost, site coverage, linked infrastructure development and stakeholder involvement (Othman, 2013). As MCP it impacts on the environment, society, local resources and the community having several stakeholders and national cultures. In addition, the need for high design knowledge, technical skills, managerial capabilities, political and economic stabilities, coupled with sustained business environment are all sustainable challenges for Ghana as a developing country and therefore the project. Research participants further mentioned lack of matching infrastructural development as a major challenge. Power, water, sanitation, transport, telecommunication are some of the major utility services lacking and threatens the sustainability of the project. In the opinion of respondents, economic and political stability are prerequisites for MCPs sustainability not to mention convenience in accessibility and proximity.

#### **4.3.4 Efficient transport systems and sustainability**

A project architect at GACL interviewed agreed that transport system and integration to the urban transport network is ill-considered just as the Durban stadium development in South Africa (Hannan and Sylvia, 2015). The project is not accessible from three lane carriage Liberation road linking the Tetteh Quashie interchange from the Tema motorway and the Legon high income residential areas. The two vehicular accesses with exits to the project site; airport by-pass and the north liberation road remains single carriage lanes with high vehicular traffic unprecedented throughout the day and very difficult to exit or join. Project managers agree and continue to advocate for the airport by-pass which links the trade fair site, aviation village and the cantonments area to be developed as a dual carriage.

The Accra City Project has no bus terminal for urban commuters using public transport. In addition the site has no links with the proposed rapid transport network neither accessible by train nor has parking spaces designated for buses for group tour or usage of the place. Least to mention is the pedestrian consideration at the Airport City which though bordered by roads at all sides lacks properly designed pedestrian walkways and provision for bicycles use which is advocated by urban transport designers to ease traffic jams. Thus with the current terminal three airport expansion proposal in that direction, road traffic will increase, aggravating the existing situation and affect patronage.

Research participants were of the view that absence of multi-level car parks at the site has created a major deficiency in the car parking provision and poor access to the facility and integration to the urban transportation system. Key stakeholders again agreed with the suggestion of reducing vehicular dominance and encourage large buses and streets in favour of the pedestrian as an alternative to cars. Providing more buses means less congestion and better air quality which encourages cycling, walking and sustainability.

#### **4.3.5 Sustainable design considerations**

The Holiday Inn and Marina shopping malls designs have little maintenance capacity for ecological system unlike the SSNIT Emporium in the enclave. The airport city project to a large extent promotes integration of economic, social and environmental concerns without nature consideration and the

well-being of the people and environment (Gibbs et al., 1998; Hopwood et al., 2005). Sustainable principles advocates by LEED; sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality as measures necessary for building sustainability are considered critical when considering MCPs due to their scale and impact on the environment. There is no balance between greenery and brown areas, materials used and design are not water efficient. No single project recycles complete waste water generated in the building for re-use. The large curtain walls design with no consideration for solar orientation for the UT Bank and Vodafone offices are a major energy conservation concern. The One Airport Square and Holiday Inn however had design consideration for reduced heat generation within indoor spaces. Day lighting and natural ventilation cannot be adequately relied on hence the heavy dependence on artificial lighting and ventilation. Stakeholders agreed with the researcher that sustainable principles were not well considered but sacrificed for modern and stunning architecture. The volume of vehicular traffic has created noise and air pollution depriving the environment of quality air.

The high and rising cost of local produced building materials, fast degradation of sand sites coupled with lack of innovation for recycling or re-use of materials can be attributed to demands by these mega construction projects which cannot be sustained in the near future. Stakeholders have expressed concern about the need to reduce development of Greenfields in the city and rather suggested the redevelopment of unused sites, the re-use of infrastructure, re-use of previously developed land (Brownfield sites), and the preservation of green space.

Sustainability can be achieved as a long-term solutions to meeting community needs but requires involving multiple community partners in the planning process, using local materials equipment and technology when possible, identifying a local funding source, providing training and education, motivating beneficiaries to take ownership, monitoring and evaluating project objectives (Rotary, 2012). Barrett (2006) also suggests that sustainability can be achieved through constraints driving collaboration and creativity which eventually leads to community benefits. The need for stakeholder management role for enhanced MCP sustainability and project delivery cannot be over emphasized.

No.	Themes	Areas explored	Literature review	Project studied
1	Project nature and development consideration	Consideration of project as Mega Construction Project MCP	x	M
2		Project involved several stakeholders with diverse interest, influence and power to impact on the project	x	H
3		Consideration of project as likely to have impact on the society	x	L
4		Consideration of project as likely to have impact on socio-culture and economy	x	H
5		Consideration of project as likely to have impact on the community and environment	x	L
6	Project Stakeholder and Stakeholder Management Consideration	Project stakeholders identification	x	H
7		Project stakeholders engagement	x	M
8		Project stakeholders analysis and planning	x	L
9		Project stakeholders monitoring	x	L
10		Consideration of stakeholder management process and documentation for positive impact	x	L
11		Stakeholder management likely impact on project cost, time, performance and meeting stakeholders needs	x	H

12	Creation of vibrant culture	Consideration of creation of vibrant business culture	x	H
13		Consideration of creation of vibrant social culture	x	M
14	Sustainable principles consideration	Sustainable sites consideration, ecological balance	x	L
15		Efficient and effective use of local materials and natural resources	x	M
16		Consideration of re-cycled, re-usable materials, reduction of waste and pollution levels	x	L
17		Consideration of energy, water efficiency and clean atmosphere	x	M
18	Promoting sustainable urban transport and pedestrian walkways	Consideration of efficient transportation systems, provision of multi-level car parks, bus stops	x	L
19		Consideration of road network, accessibility and other means of transport	x	L
20		Pedestrian consideration, walkways, open spaces, green provisions		L
21	Stakeholder management	Stakeholders, stakeholder management and impact on project sustainability	x	L
22	SM and Sustainable principles consideration	Consideration of sustainable principles and impact on project sustainability	x	M
23		Convergent of stakeholder management and sustainable principles as two agents impacting on sustainability		L
24	Future of MCP	Does the country need mega construction projects in the light of SM and sustainability challenges	x	H
25	sustainability and need	Does the sustainability of mega infrastructure projects in developing countries have a future		L

Key: x-from literature review, H-High (24-35), M-Medium (12-23), L-Low consideration (0-11)

Table 1- Findings from questionnaire administered.

## 5.0 Conclusion

This paper evaluated the ACP as a mega infrastructure development, considered stakeholder management, sustainability principle consideration and their impact on infrastructure sustainability as a developing country. It addressed the questions of (1) who the project stakeholders were and their roles in the project development (2) what sustainable principles were considered and (3) the extent of impact stakeholder and sustainability principles considerations on project sustainability using eight (8) thematic areas. It concludes that the ACP was necessary for socio-economic development and has achieved its objective of creation of vibrant economic environment. Further, as a mega construction project, there was a positive impact on the economy and business culture but negatively on the socio-cultural and physical environment.

The project failed to consider stakeholder management process hence the failure to meet stakeholder needs and satisfaction except the project clients. Failure to consider the local community and other stakeholder impacted negatively on the project hence the dissatisfaction by the local community and end-users. Key stakeholders were identified and roles considered but without consideration of the entire process and the positive impact, the reason for scope changes, lack of needed infrastructure development, and negative impact on project cost, schedule, quality, stakeholder satisfaction and future sustainability.

It was further emerged that project key stakeholders were aware of sustainable principles but were not fully considered as attempts were not made for cultural heritage preservation such as building conservation, traditional architecture, creation of open spaces for social activities and integration. The lack of guidelines and tools for measuring and ensuring adherence to sustainability principles

contributed to the negative impact on sustainable sites, energy efficiency, resources effective usage, recycling of waste materials and components.

Designers aimed at meeting clients need rather than sustainability considerations hence the absence of green areas provision, pedestrian walkways, open spaces and efficient transport systems impacting negatively on sustainability of the infrastructure development. As part of contribution to knowledge in the area of stakeholder management, stakeholder management process and sustainability has been considered as two agendas that can be convergent and explored to improve the sustainability of mega construction projects.

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