Adapting Together, Thriving Tomorrow

A Review of Ghana's Building Codes and Standards

FREEDOM AND JUSTICE

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1. A REVIEW OF GHANA'S BUILDING CODES AND STANDARDS

1.1. Background

Building codes address many of society's most important concerns, including public health, safety, and environmental protection. They provide a comprehensive set of minimum health, safety and energy standards for the design, construction and maintenance of new buildings, renovations, and other engineering forms. They set an understandable and reliable floor for construction practices that reduce physical and social vulnerability to a wide range of hazards. For the most part and as applied in different jurisdictions around the world, building codes establish a building's quality, safety, and energy performance from both current and future-looking perspectives. This is essentially because initial design and construction decisions determine operational and maintenance costs for the life of the building.

After the planning and design process, the first step towards any building construction is getting a permit from the local building department, and in Ghana's situation either the EPA or the local government. The permit requires a structure's design and construction to adhere to a nationally approved standard which are usually backed by law. These codes, as implied earlier, set minimum requirements for building design, construction, and operation to protect public health, safety and the natural resources that sustain us. They are supposed to help us "build it right" at the beginning when it matters most to offer enhanced protection against the threats of natural disasters and other accidents to make our homes, residents, and communities more resilient, sustainable, and livable for generations to come.

In a sense, therefore, building equipment and other aspects of a building may be replaceable and upgradeable, but many aspects of building performance are "designed in" at the beginning, and are too expensive and difficult to change. Foundations and other parts of the building envelope are typically in place for 50 years or more. While building codes provide guidance on how to design, build and operate buildings, such codes are only effective when they are enacted into law and enforced by state and local authorities. The code development process assesses the technology landscape and consumer demand culture or trends to create a model code that can apply innovations gradually across the building sector to reduce the risk for individual builders, contractors, and occupants.

Requirements such as fire safety codes, structural and seismic standards, lighting quality, acoustics and the air quality standards all have underpinning health, safety and wellbeing, which codes consider minimizing the extent to which they effect human health and productivity. To keep up with fast changing trends, building codes are expected to be updated at least every three years to ensure new technologies, materials, and methods, as well as better approaches to health, safety, and environmental concerns are incorporated. Waiting too long in between to update codes may mean buildings are not current. From a climate change perspective and the potential impacts of climate change on buildings and other infrastructure types, adherence to building codes and the adaptation of such codes to current climate change conditions are particularly important.

Ghana, like many countries around the world, has come under the brutish impacts of climate change. While impacts have become visibility evident in most sectors, the infrastructure sector has also received its fair share of such impacts even though not a lot of attention has been paid to that. One way of ensuring that Ghana's infrastructure is resilient to climate change impacts both now and into the future is to put in place more robust building codes that are responsive to current climate and environmental impacts. This situation warrants that Ghana's Building Code is reviewed to assess its climate-proof readiness. This implies looking at exiting opportunities within the code that allows climate change considerations, as well as to identify existing

gaps or deficiencies that need to be addressed. This review has therefore been necessitated by this need and as part of Ghana's NAP process, which also aims to ensure that engineering standards and building codes are responsive to climate stress tests to ensure resilience.

1.2. Methodological Approach

The approach used here is simply document review. It is a qualitative process of reading the entire document with a critical eye, and in this regard, a climate change lens to identify where and how the codes address possible or potential climate change impact challenges and associated opportunities. Thus, the approach was to examine where the code has responded to issues of climate change and how such responses could be clarified, modified, and highlighted from the perspective of current and future climate impacts. Again, using a climate change lens, the review identified gaps that can and should be addressed. Gaps here imply missed opportunities or possible omissions which should be addressed. It is important to note that, Ghana's Building Code has a lot of foreign cultural attributions which are not properly adopted to suite Ghana's unique cultural particularities. Some provisions in the Code are therefore alien and not carefully considered for the local Ghanaian context. That said, the Code is generally broad and responsive to Ghana's construction and engineering challenges and offer significant insights into how climate change considerations could be incorporated. Furthermore, it is important to add that not all aspects of the code are relevant to climate change discussions, so the approach was to be carefully selective of themes and topics that are relevant from the different Parts of the document. In this regard, the following themes are selected based on relevance to climate change and the opportunity they present as a theme or subject to deepen climate change considerations in Ghana's building Code.

2. Development and Land Use

Development and land use are interlinked as they provide a good example of how humans interact with nature. In such interactions, how land is used for development defines the level and nature of human progress and the direction of what is perceived as development. Thus, it is fair also to say that how land is used for development in any given geographical space or context depicts then level of environmental awareness and how the protection of the natural environment is considered in development ventures. Part 5 of the building code specifies rules for land use. It makes clear provisions for development of infrastructural projects, maintenance of buildings and the selection of building sites. Such provisions are critically important, especially in an era of rapid population growth, surge urbanization and climate change. Land use management requires a certain level of intentionality to ensure land use is efficient and able to protect and safeguard environmental assets such as biodiversity and ecosystems.

2.1. Industrial and Residential Development

As part of land use and development, the Code delineates sites for industrial and residential developments as a way of ensuring a fair balance between the two. Industrial sites are for economic production purposes and are well known for high greenhouse gas emissions mostly from burning of fossil fuels to produce several products. Within the industrial zones, the code also makes provisions for other facilities such as recreation, car parks and financial zones or enclaves, which includes banks and other necessary financial facilities to serve industries.

Opportunities

Because industrial production, the type being anticipated by the Code are high carbon emitters, it presents a great opportunity for the code to consider how such production processes contribute to climate change and how measures such as nature based solutions, as well as other adaptation and mitigation measures could be integrated in the Codes. From such a perspective, some of the open spaces recommended by the Code could be intentionally used as mitigation and adaptation outlets and in ways that encourages or promotes tree planting and afforestation and with a view to use such ventures as sequesters. Trees could be used to provide shades to reduce heat in high temperatures, to serve as wind breaks and to help maintain air quality. These will ultimately constitute what has come be to be known as nature-based solutions, which if applied carefully could contribute to the effective management of climate-induced disaster events such flooding.

Gaps

Even though the code addresses issues of land use for development, such provisions are made only from an environmental management and land use perspectives, but not necessarily from a climate change standpoint. Despite all the opportunities mentioned above, there is no mention of climate change and neither has any adaptation or mitigation considerations been made in specific land use management regulations or standards. Opportunities for adaptation and mitigation measures to serve co-beneficial purposes seem to have been missed and that could be looked at again when the codes are up for renewal.

2.2. Development in Flood Prone Areas

The Code is specific about development in flood hazard areas or zones and discourages that in very clear terms. At the same time, however, the Code somehow advises that some development may be permissible on the condition that the lowest floors of any such building or structure in a flood hazard area is elevated or dry floodproofed to not less than 25 mm (1 foot) above the elevation required by this code. This is somehow contradictory and not clear and only serves as an example of how Ghana's building code has been adopted

from other cultural jurisdictions without careful consideration of how such provision suits our local contexts. Reality is, and from a Ghanaian cultural context, many desire to ignore regulations associated with building in flood hazard areas and will do anything to build. So, such contradictory provisions may not be helpful in protecting such areas.

Opportunities

Flood plain or flood hazard areas certainly provide opportunity for climate change considerations in land use management. They also provide opportunities for nature-based solutions such as parks and gardens, urban forestry, and mangroves to be employed as education and awareness avenues for the prevent floods, and to mitigate the disastrous impacts of floods. When done well, such actions could be seen purely as climate actions which can help improve adaptive capacity, build resilience, as well reduce the impact of floods, especially in urban areas.

Gaps

In its current state, the Code only addresses issues of flood in flood prone areas as environmental hazards and with no climate change consideration or dimension. The Code fails to consider changing trends of precipitation due to changing climate conditions and how that could increase flood incidents to affect the well-being of people living in and around these areas. Failure to integrate climate change thinking in flood hazard management also implies a lack of consideration for natural solutions and soft engineering approaches in addressing associated risks.

3. Fire Management Standards

Fire outbreaks are now a common phenomenon in both residential and industrial areas all over the world. While causes may vary and be attributable to different things, rising temperatures associated with changing climatic conditions have also in recent times highlighted the dangers and threats of fire outbreaks and the need for climate change to be taken into consideration as a major cause. The Ghana building code rightly identifies fire outbreaks in buildings as a major problem to be addressed through preventive regulations. Part 7 of the Code provides specific guidelines for ensuring fire safety in various types of buildings, including low-rise residential buildings, mid-rise residential buildings, and high-rise buildings. The Code is also specific on provisions for commercial buildings, industrial buildings, and institutional buildings by clearly stating the requisite engineering measures that need to be taken during construction and after. Most of these measures are found in Part 8 of the Code where guidelines are specified to address issues fire outbreaks. For instance, the Code outlines how smoke and fire detection devices should be deployed and the importance of adhering to requirements for fire-resistant-rated construction and the installation of fire and smoke protection systems in both new and old building.

3.1. Fire Safety in Buildings

The Code is clear about fire safety standards and the need for proper engineering standards to ensure buildings of all types are fire proofed. Safety provisions come in the way of what and how materials are used, The Code is specific on doors, windows, emergency exists, assembly points for emergencies etc as fire management measures that should be factored in the construction process. All these are premised on preventive assumptions; however, there is also an implicit acknowledgement of the likelihood of fire accidents and the need for post-event management approaches that ensure both the integrity and resilience of buildings.

Opportunity

The fact the Code acknowledges the threat and dangers of fire disasters in buildings and communities present an opportunity to invoke climate change and from the perspective increasing temperatures and the high plausibility of fire events. The Code in its current state seem totally oblivious of the current times and the fact that increasing temperatures create the environment for increased fire outbreaks. The satiation as presented by changing climate conditions make it necessary for the code to include climate and fire resilient building styles and materials to ensure the safety of buildings.

Gaps

Against this background, the Code does not address the potential impact of climate change on the frequency and intensity of fires, particularly on buildings located in areas prone to fire outbreaks. Rising temperatures and the possibility of fire-outbreaks are currently omitted in the provisions of the Code and must be reconsidered at the next opportunity. The Code is also silent on the requirements for fire-resistance building and construction materials.

3.2. Interior Finishes and Fire Protection

Part 9 of the Ghana Building Code focuses on interior finishes and the need to protect such areas from fire. The code contains performance and material requirements for controlling fire and smoke propagation within the interior of building. Part 10 of the Code focuses on building interior protection and fire safety systems.

Opportunity

The code provides requirements for the design, installation, and maintenance of fire protection and life safety systems, including fire alarms, sprinklers, smoke control systems, and emergency egress. These

are critically essential in ensuring that buildings are safe and resilient. Against in the face of climate change impacts such as more frequent and intense heatwaves, droughts, and wildfires, although the code did not directly address the issues of climate change not complete. Climate change may be contributing to the frequency and severity of fire outbreaks since the climate is becoming drier and hotter due to drought and heat waves. This makes fire prevention and detection very critical for infrastructure development. Although the building code did not specifically address the issues of fire as far as contemporary climate change is concerned, there exist climate change opportunities for reducing impacts on buildings as well as reducing emissions from industries. For instance, cement production companies can develop emission reduction projects by engaging in the carbon market. This will enable these companies to acquire energy-efficient technologies for their production processes while they improve product quality to withstand climate-induced hazards.

Gaps

The Code, however, fails to consider issues of sustainability, climate change and climate resilience in fire management. It fails to mention or even provide any guidelines for the use of sustainable and eco-friendly fire-resistant building materials. It fails also to consider the environmental impact of the production of the building materials used in the construction industry to assess their carbon footprints. The production of non-combustible building materials such as stones and Portland cement has high energy utilization which translates into greenhouse gas emissions. Aside from this, there are other associated negative environmental impacts.

4. Energy Efficiency Buildings

Ensuring energy efficiency in buildings is one of the major requirements to ensure climate change mitigation and sustainable development. Part 14 of the building code deals specifically with Energy Efficiency in buildings in terms of building ventilation, refrigeration, hot water systems and lighting system. The code aims to promote energy efficiency and for the sustainable management of buildings. The code is specific on building performance and especially how buildings can and may affect occupant health and productivity. Part 13 of the Code talks about issues of ventilation lighting, acoustics, and thermal comfort.

Opportunities

Energy-efficiency is at the core of climate change mitigation and sustainable living. Windows of buildings if properly designed and with the right materials may reduce energy use as well as, keep rooms comfortable and livable during extreme temperatures. Such efforts may minimize individual carbon footprints and contributions to climate change. Part 14 of the Code outline provisions for energy-efficient building design, including the use of energy-efficient building materials, lighting, and heating and cooling systems. Some of the energy efficiency mechanisms recommended in the code are solar water heating, and recovery of heat rejected from air conditioners or refrigerating equipment. Others are the installation of timers for circulating systems and regulating the installation of air conditioners and water heaters only when necessary. This is an opportunity to highlight climate change in the code and to use such regulations to promote innovative technologies that will reduce the carbon footprint of buildings, and in the process contribute to climate change mitigation.

Gaps

What is lacking at this point in the Code is the use of soft engineering nature-based solution options to promote energy efficiency in buildings and more importantly how such solutions could function as mechanisms to influence social behavioural changes. Also, the Code fails to place any emphasis on the life cycle of buildings, including materials sourcing, construction, use, and end-of-life disposal or recycling. For instance, even though solar technology is highlighted as an innovative technology, no reference is made about solar panels and the environmental risks they present. And, even though the Code talks about Solar from an energy efficiency perspective in buildings in Parts 13, 14 and 28, it fails to expand the focus of energy efficiency beyond solar. In other words, the Code does not consider other forms of renewable sources of energy such as wind energy.

5. Concrete and Materials Used in Construction

5.1. Requirements for concrete making

The type of material used in construction not only reflects environmental consciousness, but also reflects interest in sustainability issues and levels of climate change awareness. Concrete forms and types are considered in the Code and Part 20 of the Code provides instruction on practices that ensure that structural and non-structural concretes are designed in a way that aligns with the requirements of the code and standards. In brief, this part gives extensive details on the types of cement, the strength requirement, the types and textures of stones and the water pH level necessary for concrete making. It goes on to prescribe the materials and conditions required for concrete mixing materials as well as Curing Agents and Aggregate requirements.

Opportunities

These are great opportunities for resilience buildings from a climate change perspective. They are opportunities for the Code to highlight and define standards that could be used to stress-test infrastructure to evaluate and establish their resilience to climate change impacts. In other words, these standards are to ensure climate-proofing.

Gaps

What is lacking in this part is a consideration of different climatic factors in different areas and how they can affect concrete structures differently. For instance, the country's northern corridors have higher average temperatures and increasing seasonal downpours and this situation increases with changing climate conditions. In the western parts of the country, especially Tarkwa and the western coasts where rainfall is high all year round with higher temperatures, it becomes critically imperative that different grades and quality of concreate are classified to guide various uses in the construction industry and based on location. Not adding these classifications make concrete structures vulnerable to climate stressors.

5.2. Steel, Aluminium and Wood Materials.

Products of aluminium, steel and wood are very essential in building construction and the building code made provisions for the. However, these provisions are not properly outlined. Parts 21 to 25 mostly reference American and British building standards which do not provide an accurate reflection of what is required in the Ghana context. The climate system in Ghana is considerably different from that of the US and the UK, hence referencing material types, quality, and structures to the standards of these countries may not be beneficial to our country. For instance, Part 21 of the Code fails to give any specific requirements for the design and utilization of Aluminium in Ghana. It only references foreign standards which do not apply in the Ghanaian context. As stated earlier, Part 22 of the Code is alien to the Ghana context and does not reflect what Ghanaians need in their homes.

Opportunities

From a materials engineering and use standpoint, The Code provides sufficient reason for certain materials to be considered in the construction of buildings in Ghana. Part 27 of the Ghana building Code in particular foregrounds the issue of plastic waste in Ghana and the opportunity to use innovative means to use plastic in building construction. The provisions include material designs, applications, construction and installations of plastics, foam plastic insulations, interior plastic finish and strim, and plastic composition among others. A focus on plastic provides good opportunities to incorporate climate change thinking and practice in the construction sector to provide co-benefits in both adaptation and mitigation.

Gaps

The obvious gap is the fact that even though plastics is mentioned as a valuable material that could be used in the building and construction industry. This is mentioned only as a material with no reference to its environmental and climate change liabilities and how focused research to turn them into valuable eco-friendly materials in the building sector could contribute to both climate change adaptation and mitigation.

6. Mechanical Systems and Installation

6.1. Heating and Ventilation

Part 29 of the standards addresses issues related to with mechanical systems in buildings such as Heating, Ventilation, and Air Conditioning (HVAC). These standards cover the design, construction and installation of air conditioning and heating systems for the purpose of providing thermal comfort in buildings.

Opportunities

These standards provide yet another opportunity to connect issues of heating, ventilation, and air conditioning to energy efficiency standards and how they have climate change implications. The provision of thermal comfort must be linked to energy sources and types, and this is where sustainable and efficient energy systems could be relied on and from a climate change perspective.

Gaps

There seems to be a tendency in the Code to make isolated provisions. There seem to be a lack of effort to demonstrate the interconnectedness of things, systems, and issues. The provision of Thermal comfort in buildings is a clear example of how issues are dealt with in isolated ways without any effort to connect them. In short, this is an energy efficiency issue which shows how a clear opportunity has been missed to situate it in a climate change context.

6.2. Plumbing Component Installation and Maintenance

Part 30 of the Codes cover standards that regulate the design, construction, and installation of plumbing components, their use and maintenance. Plumbing systems play a crucial role in maintaining public health and ensuring access to safe water and sanitation services. Increasing frequency and intensity of extreme weather events such as high temperature and precipitation means that the design and construction of plumbing systems need to be adopted to cope with changing environmental and climate change conditions. This part of the code also governs the design, installation, and construction of drainage systems in buildings.

Opportunities

Mechanical systems can play a significant role in mitigating climate change by reducing energy consumption and greenhouse emission in buildings. Heating, Ventilation, and Air Conditioning (HVAC) systems can account for a major portion of a building's energy consumption. Therefore, building codes that include energy efficiency requirements for mechanical systems can reduce energy use as well as emission reduction possibilities associated with heating and cooling. The adoption of energy-efficient mechanical systems and technologies, such as heat pumps and high-efficiency HVAC systems can reduce warming. Another key opportunity is to design plumbing systems that promote water conservation through the installation of low-flow faucets, showerheads, and toilets. This can reduce the demand for water and ease the strain on freshwater resources, particularly in areas prone to drought.

Gaps

While doing all these, the Ghana building code did not adequately address the impacts of climate change on plumbing systems, drainage, flood risk and water scarcity. The Code also fails to identify alternative water sources from a climate change perspective. In other words, the Code assume constant water supply and business as usual to make pluming system functional.

7. Special Construction Regulations

Special constructions are structural and non-structural facilities that were not specifically captured as a major focus in the Building Code. They are treated, in a way, as “Other Matters of Concern”. Part 32 discusses special constructions and makes provisions to guide their constructions. Some of these special constructions are membrane structures, canopies, and greenhouses. These provisions apply to air-supported and air-inflated structures which are powered by standby generators.

Opportunities

To reach a global temperature of well below 2 degrees above pre-industrial levels by 2030, limiting the use of services that emit greenhouse gases is a necessary measure. These greenhouse gases that are emitted from sources like generators and vehicles contribute to climate change and should therefore be discouraged. Instead, the focus should be on the promotion and embrace of cleaner and efficient energy sources such as solar which is also relatively cheaper in the long run as compared to the national grid or generators and contributes to environmental quality.

7.1. Design and Construction

This part focuses on how some special buildings are designed and constructed. It requires that construction of awnings and canopies for example must be done to withstand wind or other lateral loads. As extreme weather events such as strong winds are becoming increasing rampant and intense, it becomes imperative that awnings, marquees, and canopies are fitted well to withstand these extreme weather events and to make the generally climate -resilient.

7.2. Solar Energy Systems

Solar energy systems are crucial to reducing greenhouse gases emissions into the atmosphere. Solar Energy is eco-friendly and sustainable, however, poses a great threat when it comes to the disposal of inverter batteries and other peripherals. Thus, while thinking of the best solutions with less environmental impact, there is also the need to explore other alternatives such as solar hydrogen technologies as well as long-lasting inverter batteries.

8. Green Building Requirements

The definition of green buildings as provided by the Code are heavily reliant on foreign concepts and notions that fail to take into consideration Ghana's unique socio-cultural context. Defining green building with UK, US and Australian standards does not always reflect the condition and the needs in Ghana. Section 37.3.1.1.1 of Part 37 defines solar heat gains and their design requirements for green building. While this looks convincing, the Code fails to demonstrate what this means or what it takes to achieve in the Ghanaian context. This design looks sound in its ability to trap heat within buildings; however, it is also a fact that most Ghanaian homes will rather want to trap cold than heat so clearly this is one provision that has been taken out of context and applied here in ways that are illogical.

Ultimately, it could be said that climate change presents both challenges and opportunities for building codes. On the one hand, buildings are significant contributors to greenhouse gas emissions, accounting for around 40% of global energy use and 30% of carbon dioxide emissions. Improving the energy efficiency of buildings can therefore have a significant impact on reducing emissions and mitigating climate change. On the other hand, climate change is also affecting the way buildings are designed, constructed, and operated. The sections below, therefore, present other general opportunities, as well as recommendations that could inform further review and enhancing of Ghana's Building Code to make it climate responsive and climate ready.

General Opportunities to Enhance Ghana's Building Code

- The Code specifies the installation of fire and smoke protection systems such as fire alarms, sprinkler systems, and smoke detectors. These systems can be enhanced to include sensors that detect high levels of carbon dioxide to indicate the presence of a fire or other dangerous gases.
- Incorporating materials and finishes that have low embodied carbon, can help reduce greenhouse gas emissions and minimize the environmental impact of construction.
- Using materials and finishes that are non-combustible, resistant to heat and flame, or treated with fire retardants, can help reduce the risk of fires and minimize the spread of smoke and toxic fumes, which can have severe health impacts.
- Incorporating renewable energy sources in building fire safety systems, such as solar-powered fire alarms can help reduce greenhouse gas emissions and minimize the environmental impact of construction.
- Plastic is a widely used material in the construction industry due to its durability, versatility, and affordability. The use of plastic as building materials reduces the overreliance on other building materials such as wood, cement, metal, and glass, which may not be environmentally sustainable and climate friendly.
- Installation of energy efficient systems in buildings as directed by the codes such as a combination of natural and artificial lighting systems such as brightening patterns and daylight factor, are key to reducing emissions in a building.
- Develop a framework to assure the resilience of building materials through their ability to withstand specific climate-induced stress tests.

Key Recommendations

- The next update of the Building Code should prioritize the contextualization of certain provisions within Ghanaian socio-cultural realities to make them relevant.

- The current Building Code is top-down and prescriptive. The most user-friendly building codes are made through participatory and stakeholder engagement processes.
- There is need to incorporate climate change and environmental sustainability considerations in the next update of the Building Code.
- Some key provisions should be aligned to create a system of interconnected standards to ensure uniformity and universality.
- While emphasising on hard engineering standards, the Ghana Code could also do with relevant soft engineering standards such as nature-based solutions as a complement and a mechanism for social behavioural change,
- The code could consider life cycle and environmental impact assessments of all building materials to make them climate compliant and sustainable.
- Interior finishing and materials used in building must be made to pass toxicity and low-carbon stress tests.
- The Ghana Building Code should mandate periodic climate change- induced infrastructure stress test for major infrastructure.
- Building codes should encourage innovation and new climate change compliant technologies that can improve building performance as well as reduce emission levels.
- Increase focus on renewable energy means Ghana's Building Code should promote the use of multiple and alternative renewable energy sources such as solar or wind power.
- There is need for clear regulations on the disposal of plastic waste and how plastic waste could be processed and used in the building and construction industry.
- The Codes should incorporate technologies for alternative water sources such as rainwater harvesting systems, greywater recycling systems, and wastewater treatment plants. into plumbing systems.

Stakeholder Engagement Approaches

As indicated in the review report, an effective Building Code is one that is created through participatory and democratic processes that allow diverse stakeholders to have an input and to own the process. As part of this review and in relation to possible future update of the Building Code, we recommend that conscious processes are put in place to identify key stakeholders and engage them to discuss not only the issue of climate change implications for the Codes, but also the overall enhancement of the Code to suit current and anticipated future trends. It might also be helpful to use such engagement processes to adopt and align aspects of the Codes to Ghana's unique cultural and socio-ecological peculiarities. Approaches could take the form of workshops where carefully selected stakeholders are brought together to examine and provide inputs to the review report and to collectively explore ways of using the report output to improve and update Ghana's Building Codes. In place of a workshop, key experts within the stakeholder group could be identified to review the report and to send inputs which could be compiled and made available to the requisite institutions responsible for the development of the Building Code. While there may be an endless list of potential stakeholders, we have provided a list below as a starting point with the possibility of additional stakeholders.

Suggested List for Stakeholder Engagement

STAKEHOLDERS	CONTACTS
Association of Building and Civil Engineering and Contractors	+233 (0)303 966 922
The Ghana Cement Manufacturers Association	+233 302 666 915- 7
Ghana Energy Commission Academia (Engineering dept, Climate & Sust. Dept, Environmental Studies, Planning, Estate Management, Building Technology, Architecture etc)	030 281 3756
Ghana Standard Authority	030 250 0066
Ghana Green Building Council	0553677741
Ghana Institution of Engineering	030 276 0867
Ghana Chamber of Construction Industry	0302954456
Ghana Real Estate Developers Association (GREDA)	024 130 1973
District/ Municipal and Metropolitan Assemblies	
Ministry of Local Government and Rural Development and other Relevant Ministries	