

## **The drawbacks of the lack of building codes and regulations in Somaliland: Public health and safety implications<sup>1</sup>**

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### **Abstract**

Over the years, building codes (BCs) have been seen as an important driver for economic development. This is because building codes tackle a great number of any society's most significant concerns and expectations for health, safety, well-being and environmental protection as well as establishing a baseline for suitable and cost-effective building quality. Consequently, this paper carefully explores and discusses the current construction practices before elucidating the major flaws and health & safety implications associated with the lack of building codes and its enforcement in Somaliland. The study concludes that the Somaliland government would have to take audacious steps regarding the implementation of building codes with the aim of reducing chronic and disaster risk while making progress towards a sustainable future. Moreover, practical recommendations for the future formulation of strategies/measures that will guide the development, implementation and enforcement of building code in Somaliland are proposed for public health, safety and well-being.

**Keywords:** Construction practices, construction projects, building codes and regulations, public health, public safety, low- and middle-income countries, Somaliland

### **1. Introduction**

Over the past two decades, natural hazards and disasters have resulted in the loss of more than 1.3 million lives, upset approximately 4.4 billion people, and led to \$2.91 trillion in economic losses globally, between 1998 and 2017 (Pascaline, House, McClean, & Below, 2018; Sun, Gao, Gong, & Wu, 2020). Unfortunately, the poor and the marginalized have been excessively affected by

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<sup>1</sup> How to cite this paper: Fashina, A.A. Sheikh, A.A., Fakunle, F.F & Opiti, C. (2020). The drawbacks of the lack of building codes and regulations in Somaliland: Public health and safety implications; *PM World Journal*, Vol. IX, Issue VII, July.

these hazards and disasters. In particular, 85 percent of entire disaster-related death toll have been globally linked to the low- and middle-income countries (Sun et al., 2020). It has also been established that the effect of these disasters on gross domestic products (GDP) is about 20 times higher in high-income countries than in the low- and middle-income (Pascaline et al., 2018). Interestingly, this fact still invariably poses as an underlying threat to the Sustainable Development Goals (SDGs) that is geared towards putting an end to poverty and improving shared prosperity by 2030.

Although, attention and efforts to minimize the danger of large-scale severe health and safety risk occurrences in built environment might have overshadowed the increasing impact of smaller chronic risks, there have been an increased evidence in recent years which argues that the collective impacts of daily hazards resulting in remote losses are in actual fact superior to those of large disasters resulting from life-threatening occurrences (I. O. Adelekan, 2019; Bull-Kamanga et al., 2003). Nevertheless, their impacts on low- and middle-income countries are broadly underestimated, as they often fail to meet up with the standards that may qualify them as “disasters” in a global context (Faling, 2010; Sun et al., 2020). Consequently, a notable part of damage to housing, basic facilities, and low-income households influenced by small disasters has been poorly reported and ignored (I. Adelekan et al., 2015).

Taking a closer look, one could thus argue that the present development models add up to the widespread of hazard and susceptibility factors and consequently to the scaling up of disaster risk (I. Adelekan et al., 2015; Sun et al., 2020). Meaning that the vulnerable populations are not just affected by the possibility of catastrophic occurrences, but also suffer from the additional tricky and distributed losses of chronic risks, that often end the lives of thousands in fire outbreaks and impetuous collapse of inadequately designed or crudely constructed buildings (Bull-Kamanga et al., 2003; Faling, 2010). For instance, building collapses are a common, disastrous occurrence in low- and middle-income countries. A predominantly robust model of collective fire outbreaks and impetuous collapses of buildings in India (Raul H. Figueroa Fernandez, 2014), Bangladesh (Bolle, 2014), Nigeria (Helen Ifedolapo, 2015), Uganda (Mwanaki & Ekolu, 2014), and Kenya (Raul H. Figueroa Fernandez, 2014) in the last 25 years clearly exemplifies how the combined loss of human lives and basic facilities/properties in many of the low- and middle-income countries can be evidently defined as a disaster of noteworthy magnitudes.

While data about these unfortunate cases are distinct and not well organized in low- and middle-income countries, a few of them can still be explored in the literature. One of such is the work by Mwanaki & Ekolu (2014), who reported that 54 building collapse deaths and 122 injuries occurred between 2004 and 2008 in Kampala, the capital of Uganda. In 2012, India recorded 2,737 spontaneous building collapse incidents that claimed the lives of over 2,600 people and resulted in the injury of 850 persons (Raul H. Figueroa Fernandez, 2014). In another comprehensive study by Windapo & Rotimi (Windapo & Rotimi, 2012), the authors pinpointed 112 cases of building collapse and their causes in Lagos, Nigeria from December 1978 to April 2008. According to the Nigerian Building and Road Research Institute, 199 people died in four collapsed buildings incidents between 2014 and 2016 and more recently, Adugbo et al. (Daniel Adugbo; Haruna Ibrahim; Titus Eleweke, 2019) reported in a Nigerian daily newspaper that between February and May 2019, 29 deaths and 76 injuries were recorded from 13 building collapse incidents across Nigeria. In a more dreadful incident that occurred in April 2013, Bangladesh saw the deaths of over 1,200 persons, as a result of the collapse of an eight-story commercial building (Bolle, 2014).

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These cases are quite alarming and set the path for a pathetic call for the need to improve the health and safety of people from the lingering risks in low- and middle-income countries.

Scholars and professionals within the construction industry however believe that the implementation and enforcement of building codes, regulations and legislations has a vital role to play in the reduction of disasters on built environments (Haupt, 2001; Lin & Mills, 2001), one which until now has not been at the center of the low- and middle-income countries' decision-making process. As a result, it has provided supports for a shift in efforts from the management of disasters to the reduction of fundamental risks in some of these countries (Sun et al., 2020). Moreover, since the status of the construction and building sector directly or indirectly affects the economic, political, social, civilization, and industrial aspects of any country (Chan & Chan, 2004; Ilhan & Yobas, 2019), it is vital to establish codes and standards to implement construction projects. In an effort to make them successful, it is however important that building codes and standards be incorporated into a broader health and safety culture that should include construction and structural engineering education and construction professionalism training along with legislation, and support for implementation and enforcement measures/policies (Jo da Silva, 2012).

This is quite significant in the sense that, in a decade from now, it is expected that new urban development will exceed all previous urban advancements all through history and approximately 60 percent of the areas expected to be urbanized or built by 2030 are located in Sub-Saharan Africa and South Asia (UNISDR, 2015b). Likewise, it is estimated that by 2050, the world will experience the construction of one billion new housing units (UNISDR, 2015a). Intriguingly, majority of these developments are expected to occur in cities with feeble capacity to safeguard risk-sensitive urban expansion. It is thus important for the international community to act swiftly in order to seek to attain more productive procedures to the development, enforcement and compliance of building codes and regulations in low- and middle-income countries. This is because the negligence of building regulatory policy and compliance in low- and middle-income countries has been aggravated by appallingly formulated and awfully communicated building codes. Corruption at the local level of regulatory authorities, has also jeopardized the implementation, enforcement and compliance of code in buildings in these countries (Jigyasu, 2013). However, by implementing building regulations and championing its vigorous enforcement and compliance, the application of present scientific and engineering understanding of a secure built environment can be hasten.

Furthermore, the last decade has seen an increasing development in the Somaliland construction sector that has led to the acceleration of rural-urban migration in the major cities in the country (Flahaux & De Haas, 2016; Omar, Fashina, & Fakunle, 2020). In spite of the rapid development, the rural-urban migration has taken place in the absence of building codes and regulations. This however, has its future consequences which can be linked to the fact that urban development without regulatory guidance like the building regulations, majorly leads to the expansion of unsafe vulnerable settlements that can extend into chronic and disaster risk (I. Adelekan et al., 2015; Pelling & Wisner, 2012). The Government of Somaliland should thus learn from the experiences of the aftermath of the failure of implementing or enforcing building regulatory policies in other low- and middle-income countries to make decision at the early stage to adopt progress-building regulations (Jigyasu, 2013; Sun et al., 2020). It is thus clear that there is a need to produce building codes in Somaliland that will regulate material, methods of construction, installation of fixtures,

equipment, and accessories. However, the introduction of building codes will not be effective unless there is a proper administration and enforcement process that will activate the implementation of building codes (Jigyasu, 2013). This implies that the social and physical challenges of the rapid development in Somaliland require a futuristic building code institutional framework with the capacity to manage the balance between environmental interests and the health, safety, and general welfare of the citizens. This could boost the development of effective buildings and real estate industry as well as protect the citizen's lives and properties. It is on this note that this paper seeks to convince the Government of Somaliland to develop its own set of building codes. This paper also aims at providing construction practitioners, private sector, donor entities, policy-makers, and governments agencies with an improved understanding required to leverage good-practice of building codes and regulations in the reduction of chronic and disaster risks, thus setting war-torn and conflict-prone countries on track toward successful urbanization reform.

The first part of the current paper provides the background introduction on chronic risks, natural hazards and disasters in built environments that relates to the lack of building regulations in low- and middle-income countries. In addition, the overview of building codes in selected high-income countries and the widespread problem of the lack of building codes and regulation in low- and middle-income countries are also presented. At the same time, the paper highlights the construction practices and drawbacks of building codes & regulations in Somaliland before exploring the implications of the lack of building codes and regulations on the health, safety and welfare of the general public in same country. The last part of this paper presents the concluding remarks and noteworthy recommendations of the policy tools and measures that can efficiently contribute to the health and safety aspects of the building industry via the development, implementation and enforcement of building codes in Somaliland.

## **2. Overview of building codes**

In the past few decades, natural and human-instigated disasters have on one hand exposed the weaknesses of humans in safety standards and on the other hand shown us ways to improve on these standards (Francis D.K Ching, Steven R. Winkel, 2016). The increasing advancement of building codes over the years has helped in the reduction of mass casualties from building collapses, fire outbreaks, and flooding (Rountree, 2001). Majority of Building Codes (BCs) in most countries cover the safety of lives (Rountree, 2001). Building codes provide significant safeguards for buildings and thus ensuring that they are safe for habitation. Simultaneously, excessive or outdated standards and codes can unreasonably add up to the cost of new development, which can in turn dampen the activities of a new construction project (Ching & Mulville, 2014).

A number of codes including building codes support the promotion of health and safety in both residential and non-residential structures (Chauvin, Pauls, & Strobl, 2016). In this case, building codes mostly address structural features and materials, as well as plumbing, mechanical, electrical, and energy codes (Laustsen, 2008). There are also dedicated codes that encourage specific designs, such as accessibility for people with disabilities. Instead of designing their own set of codes, majority of the building/construction authorities adopt model codes developed by a national or international standards organization, like the International Code Council (International Code

Council, 2015). Some countries adopt these codes, with or without further modification, and require management and enforcement of those codes through strategic review and inspections at the local level (Malalgoda & Amaratunga, 2015). Other countries allow local authorities to implement their own codes or to adjust international or national codes to suit local conditions.

Furthermore, the US, UK and Australia remains the main drivers of Building Code with the US having the most detailed requirement (Annunziata, Frey, & Rizzi, 2013; Commission, 2011; Ellingwood, Galambos, MacGregor, & Cornell, 1980). For the UK, the BC focuses more on energy efficiency (Annunziata et al., 2013), while the BC for Australia focus on sustainability and their objectives are similar to that of the US (Commission, 2011). Interestingly, in some cases, you can have cities in the same country having different requirements for building code. This is peculiar to countries where the town or city lies in the path of hurricanes or cities where there are many high-rise buildings with high population density or cities where oil blocks or refineries that create hazards are located (McMullan, 2018; Wong, 2010). Moreover, most of the building codes for cities/municipalities are based on standards established by the International Code Council (ICC) (Commission, 2011). Yet, each city/municipality may choose to create their own requirements besides the standard building codes.

### **3. Barriers to the implementation and enforcement of building codes in low- and middle-income countries**

Over the past three decades, there have been consensus among many researchers and government research agencies on the challenges related to the deficient implementation and enforcement of building code (Black, 2004; Harley-Haddow, 1981; Jigyasu, 2013; Listokin & Hattis, 2005; Marszal et al., 2011; McFann, 2012; Paz, Leigh, Paz, & Leigh, 2004). Some researchers believe that there exist some barriers to the enforcement of building codes or regulations for residential construction that often do not get required engineering attention regarding the wind load and drainage requirements, and other external factors for building codes (Boggs & Dragovich, 2006; Ching & Mulville, 2014; Harley-Haddow, 1981; The Building Department (BD), 2013). Others believe that building regulations are mostly too complicated for many parts of the building industry (Funke F. Fakunle, Opiti, Sheikh, & Fashina, 2020), and as such, many construction industries struggle to understand the need for building codes, particularly, in the low- and middle-income countries (Iwaro & Mwashu, 2010; Liu, 2010; Low, 2005). This can however, be traceable to the fact that corruption in the enforcement of building codes has been linked with the widespread building failure and loss of life in disasters (Iwaro & Mwashu, 2010; Liu, 2010; Low, 2005). This is depicted in the evidence from recent statistics that indicate that 83 percent of all deaths related to earthquakes in the last four decades or more have happened in countries considered to be the most corrupt nations (Iwaro & Mwashu, 2010; Liu, 2010; Low, 2005).

Another indispensable issue in the low- and middle-income countries is the unavailability of funding and support for building codes and regulations at the local level (Iwaro & Mwashu, 2010; Liu, 2010; Low, 2005). The issue is generally entrenched in huge challenges that are related to income levels and authority over tax policy (Iwaro & Mwashu, 2010; Liu, 2010; Low, 2005). In addition, many local governments do not possess the appropriate staff with technical skills required to properly screen construction projects (BRE, 2008; Building Research Establishment, 2019). Nevertheless, the problems of deficiency in the implementation or enforcement of building

code are generally common but slightly differs from country to country (BRE, 2008; Building Research Establishment, 2019). In Jamaica for instance, research has shown that 85 percent of the population cannot afford the housing units that conforms with the nation's existing formal planning and building standards and this has led this group to ignore the implementation and enforcement of building standards in their buildings (Janda & Busch, 1994).

In a study by Erastus and Wuchuan (Kabando K. Erastus and Pu Wuchuan, 2014) in 2014, the authors argued that difficulties involved in the introduction of new building materials technology in Kenya can be traced to the Ministry of Local Government 1969 Kenya Building Code that is still presently used despite the efforts made by the Ministry of Housing in 2012 to redraft the Code to become a dynamic and performance-based code (Kabando K. Erastus and Pu Wuchuan, 2014). This further explains the reason for the recurring number of collapse and fire outbreaks across the country overtime. Similar to the scenario in Kenya, the building codes for Uganda is not ready till date in spite of the approval of the Building Control Act in 2013 by the Ugandan presidency (Mwanaki & Ekolu, 2014). The reasons for the delay in the implementation and enforcement of this Act can be linked to a number of challenges such as limited funding (Oluka, 2016). In another work in 2016, Fekele et al. (Fekele, Quezon, & Macarubbo, 2016) explored the health and safety practice in building construction in Addis Ababa, the capital of Ethiopia. Out of the 12 factors investigated in the study, the authors identified inadequate enforcement of the existing building rules and regulations as the second most significant factor that influence health and safety issues in building construction projects in Addis Ababa, Ethiopia (Fekele et al., 2016).

Furthermore, in spite of efforts made by the Architects Association of Tanzania (AAT) to design and hand over the Building Code to the Tanzania government in 2003, the Code did not gain attention until after a decade, following the collapse of a 16-storey residential apartment in the capital that claimed 36 lives and left more than 60 persons trapped under the wreckage in 2013 (Kiganda, 2017). The haphazard and illegal real estate development in Tanzania at the time was traceable to the preference of most building owners to employ the services of outdated and unregistered contractors due to cost (Kiganda, 2017). Unlike other eastern African nations, Rwanda has regularly reviewed the nation's building code since its introduction in 2009 and adoption in 2015 (Fabrice Mwizerwa and D. Buddhi, 2019). In a recent development in the early part of 2019, the Government of Rwanda expressed her commitment to building a safer future for its citizen by taking a bold step to revise the Rwanda building code that gave birth to the Green Building Minimum Compliance System (GBMCS) (GGGI, 2019). The GBMCS targets new large-scale commercial buildings, educational buildings, assembly buildings, health facilities and other public buildings with the aim to effectively minimize chronic and disaster risks (GGGI, 2019).

It is therefore clear that imperfect and incompetent building regulatory enforcement has repeatedly not been able to protect the lives of people and their properties in low- and middle-income countries as exemplified in the selected cases of eastern African countries presented, asides Rwanda. One can thus argue that the failure to develop and implement productive building regulations is particularly harmful to low- and middle-income countries and this is perceived to varies from country to country.

## 4. Construction practices and drawbacks of building codes & regulations in Somaliland

### 4.1 Location of Somaliland

Somaliland is a semi-desert territory on the southern coast of the Gulf of Aden. It is bordered by the remainder of Somalia (per international recognition) to the east, Djibouti to the northwest, and Ethiopia to the south and west (See Figure 1) (Hunt, 1951; Omar et al., 2020). Somaliland lies between the 08°00' – 11°30' parallel north of the equator and between 42°30' – 49°00' meridian east of Greenwich. The area of Somaliland is 176,120 km<sup>2</sup> (Hunt, 1951).



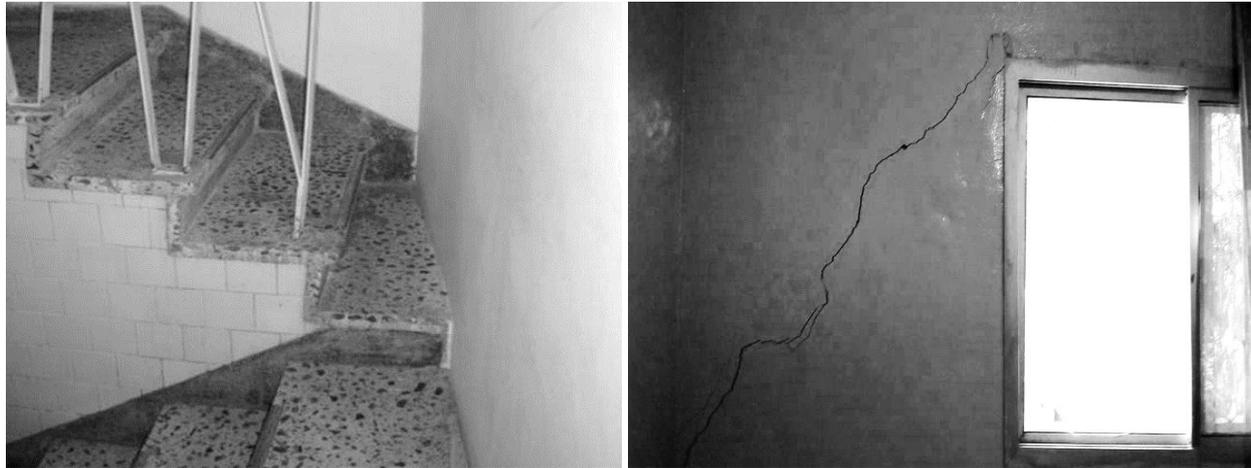
Figure 1: Somaliland Map and Boundaries.

### 4.2 Building and construction practices in Somaliland

In the past decade, Somaliland has been experiencing an increasing affluent in its construction sector (Hoehne, M. V., & Ibrahim, 2014). This is because the construction and real estate industry contribute massively to the country's Gross Domestic Product. Most permanent urban dwellings are built with cement blocks, with a zinc roof on top and the most expensive structures are built with concrete columns and beams with a slab as a roof. In the construction of these structures, the engineer usually uses his own judgment and experience in order to produce a sound building with no government supervision whatsoever (Sheikh, Fakunle, & Fashina, 2020).

It is quite common in Somaliland that the owner or his representative (a consultant, family member or friend) supervises the construction of their buildings. Since there is no building codes/regulations and enforcement, most of the owners in Somaliland act as general contractors and consultants when they choose to build their homes and commercial building (Ministry of Housing and Public Works, 2019; Sheikh et al., 2020). Most at times, they even go further to hire inexperienced contractors and consultants in the search of a cheap labor. This is contrary to International Building Code that indicates that a registered engineer is required to carry out the design and construction of buildings (ICC, 2012). This can be traced to the fact that there is no article in Somaliland Law which imposes regulation to theoretically or practically test or exam the skills of contractors and construction professionals (Hargeisa Regional Court, 2019; Omar et al., 2020). This however in turn leads to major defects during and after the construction stage.

Instances of these defects can be seen in Figure 2. The consequences of these major defects are certainly huge in number (Fakunle & Fashina, 2020). These may include loss of enormous financial resources, additional maintenance repairs, and other hazards.



**Figure 2:** Major defects in a building in Hargeisa

### **4.3 Overview of the drawbacks of the lack of building codes and its enforcement in Somaliland**

Although there have been efforts made by the Ministry of Housing and Public Works (MHPW) in 2018 to establish a Building Code & Quality Control Department in the Ministry, nothing has been done yet in terms of building codes and regulations in Somaliland (Ministry of Housing and Public Works, 2019; Sheikh et al., 2020). One of the notable efforts by the Ministry in 2018 was the establishment of a Building Code & Quality Control Department with six Senior Somaliland personnel from different fields such as Civil Engineering, Electrical Engineering, Mechanical Engineering to make a draft for building regulations in Somaliland (Ministry of Housing and Public Works, 2019). However, till date the initiative has not yielded any outcome as work is yet to kick off in this direction.

According to the MHPW, some efforts were also made by Somalilanders in the diaspora to establish a preliminary draft for Building Codes. However, most of their efforts was derived from European and western standards such as Eurocodes which is very different from the Somaliland context and does not incorporate the unique risk patterns, history, building traditions, and economic and social constraints of the country (Ministry of Housing and Public Works, 2019; Sheikh et al., 2020). For example, many sections of the draft contained ample information about timber structure, snow load etc. Nevertheless, there are no timber structures in Somaliland neither do the country experience snow which made most part of the draft invalid.

Over the years, heavy floods have led to the deaths and injuries of many, leaving thousands of persons homeless at different times in Somaliland (MERD, 2019). There were also cases where people were electrocuted by downed electric wires during heavy or tropical rainfall (MERD,

2019). These incidents are as a result of the absence of building codes and safety regulations that forbid construction in flood prone areas or ensure appropriate electrical wires are utilized for overhead power lines. Table 1 shows that building codes-related disasters majorly happened in Hargeisa, the capital of Somaliland. While most of the disasters experienced were flooding due to torrential rain, heavy rain or cyclonic storm other were related to building collapse and electrocution (MERD, 2019). As depicted in Figure 1, the major damages caused by these incidents includes the destruction of buildings and bridges, rooves blown off, and destruction of farms. Table 1 also revealed that the 2018 tropical cyclone Sagar affected over 670,000 persons. This is the most impactful among the disasters that have occurred in Somaliland. A detail information is provided in Table 1 below:

**Table 1: Ten building codes-related disaster occurrences in Somaliland**

Date	Disaster	Region or City(ies)	Recorded Deaths	Injuries Recorded	Number of Persons Affected	Damage	Cause (s) or Comments
24 <sup>th</sup> Oct., 2005	Flooding	Hargeisa, Burao, Berbera, and Boroma	5	Not available	1,000	170 buildings and 2 Bridges	Torrential Rain
6 <sup>th</sup> May, 2011	Collapse of stadium walls	Hargeisa	At least 3	3	Not available (Spectators)	1	Torrential rain
11 <sup>th</sup> Aug., 2011	Flooding	Hargeisa	2	Not available	Not available	10 (Rooves blown off)	Heavy rain fall
11 <sup>th</sup> Nov., 2013	Collapse of old houses and flooding	Berbera	0	Not less than 10	500 families	50 (Collapsed)	Cyclone Rain
14 <sup>th</sup> June, 2016	Flooding	Hargeisa	8	26	41,000	100	Torrential rain
19 <sup>th</sup> May, 2018	Flooding	Hargeisa	52	Over 1,500	670,000	700 (Farms)	Tropical cyclone sagar Heavy rain Car swept off
14 <sup>th</sup> May, 2019	Electrocution and flooding	Hargeisa	5	9	Not available	Not available	(3) Electrocuted by live lamp post (2)
27 <sup>th</sup> Aug., 2019	Rooves blown off and flooding	Hargeisa	3	18	Not available	67 (Rooves blown off)	Heavy rain
6 <sup>th</sup> Oct., 2019	Flooding	Hargeisa	6	Not available	Not available	Not available (Hotels, buildings and roads)	Heavy rain Car swept off (4)
9 <sup>th</sup> Dec., 2019	Building collapse	Hargeisa	4	0	0	1	Old building

**Data Source:** Ministry of Environment & Rural Development, Somaliland, 2019

#### **4.3.1 The lack of proper laws and regulations that could guide the enforcement of building code in Somaliland**

Unlike in the developed countries like the US where Building Code are regulated and mandated by the US Municipal law (Baugher & Roberts, 1999; Funke F. Fakunle et al., 2020), there is no specific or relevant article at Somaliland Court of Law to regulate and enforce Building Codes in Somaliland. Majority of the building designs and construction practices in Somaliland are not regulated by approved codes and standards. Meaning that there is a lack of cutting-edge knowledge among many construction professionals in Somaliland. These situations are clear indications that the deficiency in the legal status of building codes and regulations ultimately leads to unresolved dispute between owners and contractors in Somaliland (Fashina, Fakunle, & Opiti, 2020; Hargeisa Regional Court, 2019).

According to the Somaliland Court of Law, there are tens of cases that are reported monthly in Hargeisa Court regarding disagreement on building design or material used or quantity (Hargeisa Regional Court, 2019). Since most agreements are oral and non-written, such cases have proven to be difficult to avoid. Most Somalilanders prefer oral contracts since they believe it's much quicker and also won't embarrass the contractor (Hargeisa Regional Court, 2019; Sheikh et al., 2020). With no laws in place for building standards or codes alongside the lack of written contract between the owner and the contractor, there is no legal way for the government to know if the builder is wrong or not (Hargeisa Regional Court, 2019; Sheikh et al., 2020). So, it's a limbo for the owner or the client since they can't claim anything, and likewise a problem for the government since they can't prove anything.

#### **4.3.2 The lack of proper documentation of building records**

According to Article No. 104.7 of International Building Code, "the building officials shall keep official records of applications received, permits and certificates, reports of inspections, and notices and orders issued" (ICC, 2012).

In spite of this, there are huge incidences of no records or lost records of building projects in Somaliland Ministry of Housing and Public Works. The only time the land owners, contractors, designers, or developers will meet with government officials is the payment period for the building permit (Ministry of Housing and Public Works, 2019). At this point, the owners, contractors, designers, or developers is accompanied by a government surveyor to check if the land is in the right position according to the city survey map and that is all (Ministry of Housing and Public Works, 2019). They do not have to submit any technical, architectural and electrical drawings or topographical surveys, or soil tests. So, the owner can basically build whatever he/she wants or whichever way he/she wants as long as the building is not passing the property border. As such owners, contractors, designers, or developers do not have any guide or regulation on what to do when working on their projects, or in the case of a disagreement and court cases (Hargeisa Regional Court, 2019).

#### **4.3.3 The lack of proper review of serviceable structural design**

The Ministry of Housing and Public Works does not have in place any procedure to carry out a consistency check of the structural design. The local council just issue permits without caring about reviewing the structural design (Ministry of Housing and Public Works, 2019). As such,

many inconsistent codes are used by consultants or architects when performing design since there is no review plan for serviceability by the local Municipality or the Ministry of Housing and Public Works. Some engineers use India building codes, some use American Standards, some use Saudi Arabian standards and others use informal standards that are locally agreed upon (Ministry of Housing and Public Works, 2019).

#### **4.3.4 The lack of premises identification number**

Since house address numbers are not only convenient for locating houses but essential and crucial to the safety of the general public, particularly, for emergency responders to find the location of an emergency need (Krieger & Higgins, 2002). More importantly, in the case of an emergency, response time is very crucial and address number can save the time of emergency personnel like firefighter, ambulance response unit or police to quickly and easily find a location in need. This is why Article No. 303.3 of International Property Maintenance Code recommends that building should have an approved address number that is legible and systematically positioned in a visible point from the street or road facing the property (ICC, 2012). However, this is contrary to the case of Somaliland, as house premises do not have address numbers till date (See Figure 3).



**Figure 3:** Premises with no address number in Hargeisa

## **5. Major health and safety Implications of the lack of building codes and its enforcement in Somaliland**

Presently in Somaliland, there are no building codes or regulations not to talk of safety codes that determines the accessibility of the disable community into buildings. Also, there is no structural design conformed standards that can keep the building safe, neither is there any control or baseline for the Bill of Quantity (BoQ) between the contractor and the client that sometimes result in dispute or violence. Every year, major cities like Hargeisa and Burao experiences a number of death casualties due to the lack of drainage and fire escape standards or regulations, as depicted in Table 1. More insights are provided in the subsections below:

## 5.1 Inadequate or no fire safety requirements for buildings

Like in many countries around the world, there are a number of cases of injuries resulting from residential fire outbreak in Somaliland (Somaliland Fire Agency, 2019). Residential fires statistics in Somaliland is quite alarming (Somaliland Fire Agency, 2019). Based on the Somaliland Fire Agency 2018 statistics presented in Tables 2 and 3, majority of the fire incidents occurred in the capital of the country, Hargeisa with the Bungalows having the highest rate of occurrence (Somaliland Fire Agency, 2019). This can be linked to the absence of fire code/safety requirements, as many buildings in Somaliland do not have fire smoke alarms. In recent time however, some house builders are now making efforts to incorporate smoke detectors into households and commercial building to effectively prevent deaths and injuries from fires.

According to the Somaliland Fire Agency, there was 422 reported cases of building related fire in Hargeisa in 2018 alone. Other reported cases include: 63 cases that occurred in Burao; 52 cases that occurred in Borama; and 73 cases that occurred in Wajaale (See Table 2). In addition, it can be seen from Table 3 that 50% of building fires occurred in bungalows built with cement blocks, followed by corrugated iron sheet structures with 30%, huts or “buuls” are on 15%, other structures 10% and Commercial Mid-rise building with 0%. It was also recorded in the statistics for 2018 that there was a total of 30 people that was rescued while 20 people got injured during these fire incidents (Somaliland Fire Agency, 2019).

**Table 2: Building-related fire incidents in Somaliland in 2018**

Major Cities	Number of Reported Cases	Number of Recorded-Injuries	Number of Persons Rescued
Hargeisa	422	Not provided	Not provided
Burao	63	Not provided	Not provided
Wajaale	73	Not provided	Not provided
Borama	52	Not provided	Not provided
<b>Total</b>	<b>610</b>	<b>20</b>	<b>30</b>

**Data Source:** Somaliland Fire Agency, Hargeisa, 2019

**Table 3: Percentage distribution of types of buildings affected by fire outbreaks in Somaliland in 2018**

S/N	Number of Reported Cases	Percentage (%)
1	Bungalows (Concrete)	50
2	Mid-rise buildings	-
3	Corrugated iron sheet structures	30
4	Buuls/Huts	15
5	Other structures	5
6	<b>Total</b>	<b>100</b>

**Data Source:** Somaliland Fire Agency, Hargeisa, 2019

## 5.2 Deficiency in building code associated with problems due to wind condition & floods

Despite the fact that Somaliland falls within a semi-desert environment, the design of most buildings barely considers the impact and consequences of wind-blown sand and storms (MERD, 2019; Ministry of Housing and Public Works, 2019). Besides the challenges associated with the wind loading, most design do not put into consideration the problems of erosion, sand encroachment, indoors intrusion of sand and dust, soil erosion at building foundation, sand dust deposition on façade, vents, and roof elements (MERD, 2019; Ministry of Housing and Public Works, 2019). All these issues can however be traceable to the lack of building codes and standards in Somaliland.

As indicated in Table 4, three tropical storms have hit Somaliland between 2013 and 2018 that include ARB 01, Cyclone Megh and Cyclone Sagar. The Ministry of Environment & Rural Development revealed that out the three tropical storms, the 2018 Cyclone Sagar is the most impactful in the history of Somaliland (MERD, 2019). This is because it claimed the lives of 52 persons and many animals, leaving thousands of families homeless. In addition, majority of the dreadful floods that occurred in Somaliland in the past years were mostly caused by these tropical cyclonic storms (MERD, 2019). The unfortunate cyclone incidents have shown that there is a vital need for building codes across Somaliland and how the lack of BC can affect the safety of Somalilander, in such a force majeure.

**Table 4: List of three recent horn of Africa tropical storms experienced by Somaliland**

Dates Active	Name	Area affected	Sustained wind speeds km/h (mph)	Pressure hPa (inHg)	Peak classification
8 <sup>th</sup> - 11 <sup>th</sup> Nov., 2013	ARB 01	Berbera	3-minute sustained: 55 (35) 1-minute sustained: 85 (50)	1002 (29.59)	Deep depression
5 <sup>th</sup> - 10 <sup>th</sup> Nov., 2015	Cyclone Megh	Somaliland (minimal)	3-minute sustained: 175 (110) 1-minute sustained: 205 (125)	964 (28.47)	Cyclonic storm
16 <sup>th</sup> - 20 <sup>th</sup> May, 2018	Cyclone Sagar	Hargeisa	3-minute sustained: 58 (50) 1-minute sustained: 120 (75)	994 (29.35)	Cyclonic storm

## 5.3 The lack of toilet rooms requirements for residential buildings in Somaliland

The lack of toilet room requirements in Somaliland are tremendous harm to human welfare. Checking out few houses in Hargeisa city in Somaliland, most houses are not in compliance with toilet room international standards, particularly, the International Property Maintenance Code (ICC, 2012). As such, it is a breach of building regulations when there are many buildings and houses around Somaliland including slums, which have incidences of deficient in basic toilet requirements. Despite the incidences of toilet collapse recorded in some parts of Somaliland (See

Figure 4), the Ministry of Housing and Public Works are yet to take any action regarding building codes.



Figure 4: An incident of toilet collapse in Hargeisa

#### **5.4 The lack of proper area requirements for food preparation at residential buildings in Somaliland**

According to Article No. 404.7 of International Property Maintenance Code “all spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, to prepare and serve foods with proper sanitation requirements. There shall be adequate facilities and services for the hygiene disposal of food wastes and refuse, including facilities for temporary storage” (ICC, 2012). There are many buildings and houses around Somaliland, that have inadequate facilities for food preparation (See Figure 5). Consequently, recent report by the Somaliland Fire Agency indicates that most of the 610 fire outbreak incidents that occurred in 2018 were majorly caused by kitchen electronic devices such as refrigerators, electronic cookers, microwaves, the Somaliland Fire Agency (Somaliland Fire Agency, 2019). Additionally, there are also reported cases where gas cookers were the causes for these fire outbreaks (Somaliland Fire Agency, 2019). It is thus important that the Ministry of Housing and Public Works take steps in accordance to Article No. 404.7 of International Property Maintenance Code (ICC, 2012).



Figure 5: An inappropriate food preparation area in Somaliland

## 5.5 The lack of proper sleeping areas requirements for residential buildings in Somaliland

According to Article No. 404.5 of International Property Maintenance Code “every bedroom occupied by one person shall contain at least 6.5 m<sup>2</sup> of floor area, and every bedroom occupied by more than one person shall have at least 4.6 m<sup>2</sup> of floor area for each occupant” (ICC, 2012). Following the International Property Maintenance Code regarding sleeping areas requirements for residential buildings, it is without any doubt that many houses and buildings around Somaliland do not meet up with this standard as many of them have overcrowded sleeping areas (See Figure 6). However, not only does overcrowding of sleeping areas causes great inconvenience for human, it also affects their health as well. It is thus important that the Ministry of Housing and Public Works take steps in accordance to Article No. 404.5 of International Property Maintenance Code which states that for 6 or more occupants shall contain at least 6.57 m<sup>2</sup> of floor area for food preparation purposes (ICC, 2012).



**Figure 6: An improper sleeping area in Somaliland**

## 6. Conclusions and Recommendations

The current construction practices and drawbacks of building codes & regulations in Somaliland has been explored and discussed in the present work from the perspective of public health and safety. The paper revealed that Somaliland currently has no official standards or building codes regulated by the government that the builders and other construction practitioners can adapt. This allows the contractors to rely on their best judgment and experience to build, and in some cases, they have to rely on the standards and regulations of other countries. In fact, owners rarely appoint appropriate consultants that understand what is needed to initiate and complete a construction project. In addition, since there are no official laws to fall back on, there are tens of cases in Somaliland Law Court regarding disagreements and misinterpretation of building contract. Furthermore, as at the time of writing this article, the only available official document required to start building in Somaliland is the “building permit document”. Once the builder or owner pay a fee in order to obtain the document, a government surveyor will accompany him to check if the boundaries of the property is correct and not beyond the city survey map. Besides, with the increase in the construction of mid-rise buildings in Somaliland, there is a need for laws and regulations regarding Emergency Response Plan (ERP) in buildings such as emergency exit. This

is because in the case of an emergency such as fire outbreak in these buildings, incidents like stamping or people been forced to jump from top floors can be easily avoided.

In our opinion, we suggest that the Somaliland Government should not wait until the nation experiences a major tragedy before responding to the country's building code needs but rather take preventive and bold steps regarding the implementation and enforcement of building codes with the aim of:

- introducing and establishing policies, legislations and institutional framework for building codes at the local and national levels;
- creating testing procedures and certification system for building and construction professionals;
- creating a strategic plan to design, implement and enforce building codes, regulations and laws including penalties;
- setting up procedures for proper documentation and records of building projects in Somaliland;
- making efforts to continually raise public awareness of how building and fire codes can help prevent catastrophe, enhance our environment, and protect the general public.

Nevertheless, it would be vital for the Somaliland Government to actively involve the participation of building occupants, building owners, builders, construction and building practitioners as well as the local and global public health community in the development, design and implementation of the building codes with the intention of reducing the chronic and disaster risk, and promoting the health and safety of the general public, particularly in the built environment. It is therefore important to ensure that the citizens of Somaliland are in good health, socially happy and that their properties are safe.

**7. Declaration of Conflicting Interest:** The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**8. Funding:** The author(s) received no financial support for the research, authorship, and/or publication of this article.

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