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Increased Incidences, Intensity and Scope of Disasters: Manifestation of Unsustainable Development Practices

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Abstract

Over ages, disasters have been considered as natural calamities that humanity has no control or role. However, the frequency, complexity, scope and destructive capacity of disasters continue to escalate over time, implying other factors are at play. The vulnerabilities of communities are increasing through a myriad of development practices at individual, local, national and international levels. Notable amongst the disaster hazards that have increased over time include: protracted civil strife/wars; emerging diseases; food insecurity; climate change; and pollution. To a large extent, they manifest development practices that do not conform to the tenets of sustainable development as espoused in the Brandtland Commission resolutions. This article reviews selected examples of development practices that have occasioned disasters, debunking the myth that all disasters are entirely attributable to natural causes. For each disaster considered, the article recommends a raft of practices that should be embraced to ensure development practices are not responsible for the increased incidences of disasters.

Keywords: Disasters; Manifestation; Unsustainable Development

Introduction

Disaster is a disruption of the functioning of a community or society causing widespread human, material, economic and environmental losses which exceed the ability of the affected community to cope using its own resources [1]. A disaster occurs when a hazard interacts with vulnerable settings. Vulnerability refers to the lack the capacity to reduce the probability of the occurrence of disasters or reverting back to normalcy after the disaster. Examples of disaster hazards include floods, landslides, earthquakes and tropical storms, amongst others. Hazards are thus trigger events and depending on the vulnerability of the populations, can lead to disasters. For example, the occurrence of an earthquake, landslide and floods in uninhabited geographical locations cannot be considered as disasters, no matter how strong or intensive. The aforementioned can only be described as disasters if they affect a vulnerable human population, with widespread destruction of property [1]. Therefore, vulnerability is the extent to which a community, structure, services or geographic area is likely to be damaged or disrupted by the impact of a hazard [2]. This is dependent on their nature and proximity to risk hazards. Vulnerabilities are either physical socio-economic in nature [1]. Physical vulnerability is based on the physical condition of the infrastructure and proximity to the hazards. It also relates to the technical capability of the infrastructure to resist the forces on impact with hazardous events [1]. Examples of physical vulnerabilities include: the state and nature of the roads, bridges, buildings, industries, urban development amongst others. For example Japan has a strict building code that makes it the best prepared nation in the world for disasters such as earthquakes and tsunami. In Japan, high concrete seawalls have been constructed along some coastline that avail the first line of defense against sea water while networks of sensors have been put up to set off alarms that automatically shut down floodgates and control surging sea water. Likewise, high-rise buildings have hidden skeletons of extra steel bracing; giant rubber pads and embedded hydraulic shock absorbers that make modern Japanese buildings among the sturdiest in the world. To mitigate disaster risks, Mexico tightened up building codes and is in the process of improving its emergency response strategies after the 2017 earth quake that occasioned serious damage. On the other hand, socio-economic vulnerability refers to the social and economic status of the people. For example, poor people living in flood prone areas cannot afford to put up strong concrete houses and embankments along the river banks. They are generally at risk hence lose their shelter whenever there are storms. Further, due to their poverty, they too are not able to rebuild houses and revert to normalcy after the occurrence of a disaster. On the converse, economically endowed people have the capacity to recover because of their wealth and readily available livelihoods hence are resilient. Some of the socio economic vulnerabilities that predispose communities to disasters include; limited access to resources; illnesses; disabilities; age; gender; and poverty.

Causes of disasters

Conventionally, disasters have been identified by their predominant triggering factor, often considered as natural, where humanity has no role. However, the intensity, frequency and impacts of disasters in regard to economic losses have risen since the turn of the 19th century and society in general has become more vulnerable to disasters [1,3-5]. There are indications that this is as a result of unsustainable development practices by humanity, a pointer to the fact that disasters are not entirely natural [1,4,6]. Whereas the primary trigger may be natural, such as an Earthquake, droughts, locust infestations, storms, the humanitarian emergency directed entirely by political régimes may create more resilient or vulnerable communities [1]. For example the tropical storms that occasioned massive fatalities in the Philippines in 2017 could have been less destructive if the government had in place both physical and the socio-economic infrastructure that could have enhanced the resilience of the population. Similarly, a series of famines that occurred in Ethiopia in the 70s and 80s were predominantly linked to change of regime, yet

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the underlying trigger were mainly a series of droughts that were poorly managed by the then political dispensation. Therefore, whereas many disasters may manifest symptoms of naturalism, human activities are either directly or indirectly responsible for their occurrence [6]. This article considers a selected number of development practices that have occasioned or have the potential to result into disasters.

Unsustainable development practices that trigger disasters

Deforestation

Deforestation entails removal of trees where the land is thereafter used for large scale farms, ranches, or urbanization, industrialization and other infrastructural development [7]. Often this is to address the needs of the expanding population. Literatures indicate that the most concentrated deforestation occurs in tropical rainforests [8]. Amongst countries with very high rate of deforestation include; Thailand, Brazil, Democratic Republic of Congo and Indonesia. In Kenya like many other developing nations, wood fuel and charcoal provides the basic energy needs for the rural communities, urban poor and informal sector. Wood fuel accounts for 68% of the total energy consumption in Kenya. According to a study by the Green Africa Foundation, Kenya loses 5.6 million trees daily as 64.6% of the populations depend entirely on the wood fuel (GAF, 2017). Forests make up a complicated and productive ecosystem each part helps the others and also depends on the other and are a home to over 75% of all terrestrial species [7,9,10]. The inter-linkages are such that any part affected has an impact on the other parts. Forests thus play a very crucial role in the enhancement of biodiversity. This ensures healthy ecosystem and sustainable preservation of other species. Forests provide important resources, such as timber, food, fuel, fodder and non-wood products such as shelter, soil and water conservation. They prevent land degradation, desertification and reduce the risk of floods, landslides and avalanches, droughts, other disasters. In this way, they serve as catchment for water towers. Forests contribute substantially to climate change mitigation and adaptation as considered in section 2.2. One of the most important functions of forests is in their role as carbon sinks. Here forests contribute to carbon sinks by absorbing and utilizing carbon dioxide in photosynthesis [9]. In this way, forests store large amounts of carbon sequestered from the atmosphere and retained in living and dead biomass and soil. Literature indicates that forests are responsible for sequestering large volumes of Greenhouse Gases (GHGs), mainly carbon dioxide, from the atmosphere [11]. In sequestering carbon, forests have a very crucial role in mitigating climate change. On the converse, deforestation is responsible for emitting equally large volumes of carbon into the atmosphere per year. This is due to the fact that deforestation removes the carbon sinks and the decomposition or burning of the forest biomass results in the discharge a lot of the stored carbon. In this way the 'sinks' are, converted into sources of carbon, with the attendant impacts on climate change.

Further, forests play a crucial role in the water cycle that ultimately impacts on precipitation or rainfall. Therefore deforestation has a adversarial impact on the rainfall or precipitation. It is for this reason that some countries that have not adopted sustainable use of their forests have experienced desertification. This entails the degradation of land which increasingly becomes arid, by losing water bodies as well as vegetation and wildlife. According to the United Nations Convention on Combating Desertification, land degradation activities and climate change are the main causes of desertification. For instance the 1970s, the expansion of the SAHEL region in Africa was blamed on the massive deforestation and unsustainable use of land resources [12]. More recently, reports indicate that Lake Chad, found in the Sahel region on the border of Chad, Cameron and Nigeria has shrunk by about 90% since 1960 due to massive logging in the catchment. Likewise, the drying up of Aral Sea in the Soviet Union is considered as an example of a natural area destroyed by human activities. This is attributable to the use of its water for irrigation in addition to clearing of large portions of forests that harness the water tower for the Aral Sea. The Aral crisis is symbolizes one of the planets' most catastrophic environmental mismanagement practice in the 20th century [13]. In Kenya, if deforestation is not controlled, the likelihood of complete decimation of the country's already depleting forests and woodlands continues to become a reality. Due to the deforestation, the impacts of desertification are already being experienced in many parts of the country. Kenyans are individually and collectively depleting and destroying forests, driven by self-interests against the common good. This is congruent with what Garret Hardin observes in the paper; The Tragedy of the Commons where people are destroying scarce resources for as long as the impacts affect them collectively and not individually. Globally, the tragedy of the commons is playing out in all dimensions of environmental plunder. For instance the perennial water scarcity in many cities in the world like what occurred in Cape Town at the beginning of 2018 is the outcome of the collective harvesting of forests and hence destruction of water towers.

Greenhouse gases emissions and climate change

Climate change denotes a significant change in the mean values of meteorological elements, such as temperature or amount of precipitation in the course of a period, where the means are taken over periods of a decade or longer [14]. GHGs, mainly from anthropogenic activities are the main cause of climate change as indicated in Table 1.

Studies indicate that the concentrations of GHGs in the atmosphere have increased since the beginning of the industrial era [11,14]. Worldwide, anthropogenic emissions of GHGs, mainly carbon dioxide, increased by 35% from 1990 to 2010 [11]. Overall, the bulk of the world's GHGs emissions come from electricity generation, manufacturing, domestic sources, transportation, livestock production where Methane is the dominating greenhouse gas and other forms of energy production and consumption. Climate change is a serious disaster with multi-sectoral impacts in many economies. Amongst these comprise impacts on: agricultural production systems; global disease vectors; epidemiological characteristics of diseases; extreme weather conditions such as floods, droughts, tropical storms and elevated temperatures. For example the hurricanes and the El Niño La Niño events continue to intensify with devastating impacts on communities. Further, according

GHG	How it's Produced
CO_2	Burning of fossil fuels (oil, natural gas, and coal), solid waste, and trees and wood products, deforestation, and soil degradation.
Methane	Production and transport of oil and natural gas as well as coal; livestock and agricultural practices and from the anaerobic decay of organic waste in municipal solid waste landfills
Nitrous oxide	Agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
Fluorinated gases	hydro-fluoro-carbons, per fluorocarbons, and sulfur hexafluoride, among other chemicals. Emitted from a variety of industrial processes and commercial and household uses e.g.in refrigerants, and do not occur naturally. Sometimes used as substitutes for ozone-depleting substances such as chlorofluorocarbons (CFCs).

Table 1: Sources of Major Green-House Gases (GHGs) [**Adopted**: From the Fourth Assessment Report, (IPCC, 2007)].

to [15] heavy rainfalls affect the transmission of vector-borne diseases. The water creates suitable conditions for an explosive rise in the vector population with the attendant increase in diseases like malaria and or dengue epidemic [1]. That is why there is a direct relationship between the intensity of rainfall, especially after El Niño and the incidences of water borne diseases.

Of great concern is the food insecurity occasioned by climate change as considered under section 2.3. These impacts cause extensive loss of property and human fatalities and disruptions of livelihood systems, yet they occur as result of unsustainable human practices. Extreme temperatures common in climate change scenarios exacerbate forest fires, are responsible for the melting of ice and have adversarial effect on photosynthesis, the process of primary food production. A case in point is the deadly wildfire destroyed over 700 homes in California in December 2017 is the largest blaze in the state's recorded history. This fire, Christened, Thomas fire burned more than 1000 square kilometers, an area bigger than New York City, Brussels and Paris combined. Soon after the forest fire, came torrential storms that occasioned very serious floods in the same region. This is because the fire left the land surface exposed hence vulnerable to the floods. Elevated temperatures are also responsible for the melting of glaciers are sensitive to temperature variations. Outcomes from modeling indicate that the unsustainable development patterns are likely to cause the world's average surface temperature to rise and surpass 30°C this century in this 21st century. Extrapolations from modeling studies show that by 2100, sea level is estimated to rise by an additional 46 to 59 cm as a result of thermal expansion of ocean water [14]. According to [16] EPA, the global sea level has risen by eight inches since 1870. This will also bring about the regression of coastlines with low elevation, ultimately destroying some beaches and buildings. Cities in such coastlines such as, Dhaka, Mumbai, Banjul, Lagos and Alexandria are thus at risk. This is also a threat to the existence of low lying islands. In the same vain, droughts, floods and other extreme weather events are hitting cities much harder than scientists have predicted [17]. Consequently cities are experiencing challenges with the water supplies like the unprecedented water shortage in Cape Town in 2018. Water shortages are predicted to become persistent due to as climate change. This should serve as a wake-up call to other vulnerable cities to prepare accordingly. Overall, the way forward is to ensure all systems sustainably use resources and create resilience by mitigation the consequences. For instance, in the case of the acute water shortages in the urban centers, governments should make it mandatory for each building erected to have water storage facilities to harvest rain waters. Further, water pans can be constructed to store water at the same time, serve as flood diversion facilities. Both Japan and the Netherlands have extensively invested in the two aforementioned interventions, with Japan having the worlds' largest underground storage system. To address the challenges of GHGs emissions, nations should embrace alternative sources of energy, especially the renewable types [18]. Tax wavers on renewable energy implements should be considered as an incentive for people to embrace the alternative sources of energy. Further, climate negotiations should boost momentum for policies that reduce global demand for fossil fuel. Focus should be on affordable solutions to enable countries embrace cleaner, more resilient economies, relying on renewable energy that will ultimately curb climate change. Further, nations that are signatories to national accords should implement them. Only then can the envisaged objectives be achieved. For example, the Paris accord stipulates that: in the second half of the 21st century: global warming should be limited to l below 2°C compared to pre-industrial levels; there should be zero net anthropogenic GHGs emissions to be reached; and global temperature increase should be limited to 1.5°C [19]. According to [11] Richard, carbon sequestration through forestation, reduced deforestation and land use changes should be considered as cost-effective practices towards reducing atmospheric Carbon dioxide concentrations. Unfortunately, some countries like America are opposed to adopting strategies proposed in the resolutions of the Convention of Parties (COPs), such as the Kyoto protocol and the Paris accord, yet they are the main contributors of GHGs.

Food insecurity

Food security is as a situation where all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meet their dietary needs and food preferences for an active healthy life [20]. This implies that the food is; available, safe, affordable and socially acceptable, especially in regard to people's preferences. There are several factors responsible for food insecurity, majorly attributable to human actions as considered herein:-

Climate change is cited as a major cause of food insecurity. This is because climate change increases first order impacts such as frequency and intensity of some disasters like droughts, floods and storms and others extreme weather conditions (Feinstein International Center 2010). According to the [20] WFP, climate change is increasing the frequency of climate-related disasters, creating greater risks of hunger and the breakdown of food systems. These have adverse impact on agricultural production and productivity. Further, climate change is responsible for modifications in vector behavior, nature of weeds and disease causative agents which negatively impact on agricultural productivity. Therefore, climate-related disasters destroy crops, critical infrastructure, and key community assets with the attendant food security. In many African countries, agriculture is the main source of food at the same time provides the livelihoods in most households. Consequently, food insecurity deprives people of their livelihood which creates more vulnerability, putting people in the vicious cycle of yet other disasters such as poverty, famines and diseases. The status of food security of nations has been cited as one of the major causes of political instability [21]. The link between food security and political stability of nations runs in both directions, where food insecurity can be a cause of political instability, and political instability and conflict have also been causes of food insecurity [20,22]. Political turbulence cause: displacements of populations; disrupts planning for agricultural activities; and health related challenges that are not conducive for food production. For instance last two decades, Somalia and Ethiopia experienced famine that was attributable to protracted internal conflict. Further, between 2010 and 2012, there were uprisings, commonly referred to as the Arab Spring that began in Tunisia in 2010 as simple riots attributable to the increase in the price of food commodities as considered under section 2.8. Overall, when nations address food insecurity, they to a large extent mitigate the famine hazard forestalling conflict and political instability [21,23]. To achieve food security, some nations treat matters regarding agricultural productivity and production as a priority. For instance in the European Union and America, farming is a heavily subsidized enterprise, all geared towards ensuring food security. In the developing world, a major source of food insecurity apart from climatical challenges is unaffordable farm inputs. Such nations should adopt similar strategies like the European Union and America and probably subsidize farm inputs. Subsidies for agricultural inputs improve access to seeds, fertilizer, herbicides and insecticides. For instance in Malawi, agricultural subsidies resulted in higher maize production, lower food prices and higher wages, avers that farm subsidies, if implemented for a restricted period, targeted to vulnerable groups and supported by

programmes that encourage self-sustainability enhance food security. It is in this vain that, priority for economic growth must be accorded to the agricultural sector which hosts the majority of the poor in order to ensure resilient livelihoods, ultimately ensuring food security [22,24]. A majority of the Africa counters that experience chronic food shortages can realize foods security by: commitment of the political dispensation; the quality of the policies and strategies in the food and agricultural sector; the soundness of the macro-economic environment; the inclusiveness of economic growth; and the degree of economic integration or interconnectedness [22]. Further, the implementation of national, regional and international accords geared towards creating food security is desirous. Such ones is like the Maputo declaration on agriculture and Abuja agreements in Africa. The Maputo declarations stipulate that nations should allocate their annual national budgets for agriculture to at least 10% [25]. Unfortunately, very few countries in Africa have put this into effect, thus exacerbating the food insecurity status. Overall, development strategies adopted should be cognizant of the short, medium and long term ramifications that should not be detrimental like the case hereunder. In the 1960s, two types of exotic fish, the *Nile perch*, *Lates niloticus L*., and the *Nile tilapia*, *Oreochromis niloticus* were introduced into Lakes, Kyoga, Victoria, and Nabugabo in the East African region. This was intended to boost the commercial fishing industry and enhance food security, but it has evolved into yet another ecological crisis of unprecedented level. The exotic species of fish are voluminous and fast growing hence very valuable in meeting the big quantizes required for food while the indigenous varieties are relatively small and slow at maturation. However, the exotic fish species predated on most of the native fish in the lakes, depleting them. According to [26] Ogutu-Ohwayo, the *Nile perch* could not maintain the high yield realized in these lakes when indigenous prey population was abundant in the lake. To date, there are indications that the indigenous fish varieties onto which the exotic varieties preyed on have been depleted threatening the survival of the two predator species [27]. Ultimately, these lakes have lost both, the indigenous and the exotic fish species, rendering it unproductive as a result of human action.

Oil spills

Oil spills are some of the most familiar man-made disasters, devastating to humanity and the environmental health [8,28]. Some examples to make this clearer will suffice here: In 2010 there was the worst and largest oil spill referred to as the deep-water horizon oil spill in the Gulf of Mexico. It occurred when a sudden explosion on a BP oilrig ruptured a pipe and left the well unregulated for 89 days. The underwater well leaked 40,000 to 162,000 barrels of oil a day into the gulf. It is quite difficult to fathom the proportion of environmental damage this explosion occasioned and continues to cause to date due to the slow nature of impacts of these kinds of occurrences. Nonetheless observed features include: gulf fishing has not rebounded; large amounts of oil are still present; the surrounding environment has been rendered lifeless; and at least 3,500 volunteers suffered liver and kidney damage from prolonged contact with the oil [28,29]. Another one is the Oil spill from the oil tankers Exxon Valdez in Alaska. This spill is considered one of the most adversarial environmental impacts in recorded history as it resulted in the spillage of about 750,000 barrels of crude oil [28]. The accident was caused when the ship steered off its normal route to avoid an iceberg and struck bligh reef, puncturing the cargo tanks. To exacerbate the already bad situation, there was no capacity for adequate response. The impacts were extremely adversarial with sea life being decimated. To date, there remains a large quantity of oil in the sea and it may take decades to disappear. Another oil spill occurred in 1978 when a crude oil tanker, Amoco Cadiz, ran aground, split several pieces, sank and spewed out over 1.6 million barrels of crude oil and 4,000 tons of fuel oil. The spill contributed to the largest loss of marine life ever registered from an oil spill. In Africa, some of the worst oil spills have occurred and continue to take place in the Niger Delta, Nigeria. On global scale, Niger Delta is considered one of the oil mining sites where there is extensive environmental degradation [8]. According to the [29] UNDP, 2016, there were a total of 6,817 oil spills in the Niger Delta between 1976 and 2001during which about 2 million barrels of petroleum were spilled. In 1991, during the Gulf war, over 600 oil wells in Kuwait were set on fire by the retreating Iraq forces. This resulted in very serious pollution and the Kuwait government had to expend large resources to put off the fire. To date, the impact of this in regard to environmental destruction has not been quantified. From literature cited, it is evident that oil spills are as a result of human omissions such as: accidents of tankers; faulty oil production procedures; and inadequate or non-functional production equipment [28,29].The consequences of oil spills are long lasting, affecting almost every aspect of the environment, hence, resources should directed towards preventing and preparing for them and mitigating their impacts [30].

Agricultural chemicals

These include agricultural chemicals commonly referred to as pesticides, insecticides, herbicides, fungicides and bactericides. The most alarming concern about the farmers regarding their occupational safety is the indiscriminate use of pesticides and herbicides due to the ease of their availability, relatively cheap cost and ease of application [31,32]. Pesticides and herbicides cannot be removed by simple washing or cooking by heat and hence end up in the biological food chains. Globally, a World Health Organization study established that contaminated food was responsible for 600 million illnesses with over 7% fatalities in 2010. That is why agricultural products where excessive use of pesticides are not accepted in some countries such as in the European Union. In Kenya, reports in the media continue to raise concerns about the safety of the food items sold in the informal markets and consumed by a majority of population. Here, a study commissioned by the media house Nation Media Group (NMH) in February 2018, established that most of the vegetables, fruits and red meats consumed in Kenya are contaminated with high levels of pesticides and bacteria. Further, in the same study, processed food was found to contain more than the acceptable concentrations of sodium metabi-sulphate, a food preservative that causes cancer in human beings. Agricultural chemicals pose occupational risks to farm workers at the same and consumers of the agricultural products. They produce a wide range of adverse effects on human health that include acute neurologic toxicity, chronic neuro-developmental impairment, cancer, dysfunctional reproductive, immune and endocrine systems [32,33]. A case in point is where, at the time of writing this article, over 4000 plaintiffs had sued Monsato, a global seed and chemical company located St Louis Missouri due to the dangers paused by the glyphosate, the active ingredient in their Roundup herbicide. These litigants base their argument on the findings of assorted research studies indicating that the glyphosate leads to non-Hodgkin Lymphoma (NHL). It is due to the aforementioned that stakeholders should be empowered with appropriate knowledge and skills regarding the risks of excessive use of agricultural chemicals. The use of Integrated Pest Management (IPM) strategy, where cultural practices and biological control agents are embraced is highly recommended for combating excessive use of pesticides.

And yet another challenge manifesting in the agricultural sector is the adoption of the Genetically Modifies Organisms (GMOs)

technology. GMOs are organisms whose genetic material has been scientifically manipulated through genetic engineering. This creates a plant, animal, bacteria, or virus with genes that do not occur in nature or through traditional crossbreeding methods [34]. Most GMOs are a direct extension of chemical agriculture and are developed and sold by the world's largest chemical companies [35,36]. World over, protagonists for the GMO technology argue that it is the panacea for the existing food insecurity. Antagonists argue that GMOs pose serious threat to farmer sovereignty and to the national food security [31,35]. As the debate rages, antagonists further argue that GMO technology is a terminator of biodiversity and speciation. The point of great concern is most genetically modified crops have been engineered for herbicide tolerance [31,34]. As a result, the use of toxic herbicides, such as Roundup, has increased fifteen fold since GMOs were first introduced [36]. The World Health Organization and the USA based Agency for Research on Cancer (IARC) have categorized the chemical, glyphosate, as carcinogenic [37].The wider implication of this is that genetically modified crops are responsible for the emergence of extremely tolerant weeds which can only be killed with ever more toxic poisons with deleterious impacts on humanity and environment. Due to the foregoing, over 60 countries in the world such as Australia, Japan, and the European Union require GMOs to be labeled. On global scale, some countries have banned the growing of GMOs [34,36]. Once more, this is a development practice whose long term impacts on the environment have not been established. For instance, the controversy on the safety of GMOs is as a result of the absence of credible independent and comprehensive long-term studies on the technology. To the multinationals in business, the profits raked in forms the focal point and not the adversarial impacts of such products like Roundup. According to [38] Miller, [39] Monsanto, the manufacturer of the glyphosate based herbicides has championed falsified data, attacked legitimate studies and launched prolonged campaigns of misinformation to convince governments, farmers and consumers that Roundup is safe. Of great concern are people continue to use these products, especially in the developing world where food insecurity limits their choices, due to lack of awareness. In-depth research to address these concerns is therefore desirous. Otherwise, this is a development practice that has the potential to spiral into uncontrolled magnitudes.

Pollution and technology

Pollution is the contamination of the land, water or air by harmful or potentially harmful substances [8]. Pollutants cause human suffering for a long time. However, the increased intensities attributable to developments activities pose enormous environmental health challenges. Pollutants originate from industries, domestic settings, agricultural and health sectors, amongst others. The pollutants end up in the water bodies, air, and soil with adversarial impact on life. For instance in Kenya, Lakes Victoria, Naivasha, and Nakuru; and Nairobi River are going through eutrophication majorly as a result of the disposal of effluent from respective municipalities. Amongst the most serious pollutants in modern times is the plastic material used in most of the day to day activities in human life. The world population is watching as unprecedented volumes of plastic waste are generated from various outlets. Tons of plastic debris are discarded everywhere, polluting lands, rivers, coasts, beaches and oceans. Plastic are not biodegradable and end up in water bodies such as oceans, rivers and lakes where they are responsible for very serious environmental deterioration as indicated: Plastics are ingested by the aquatic animals, which often result in their death; the physical presence of this waste interferes with the movement of the aquatic fauna as the animals get entangled plastic mass resulting in high fatalities. Further, some plastics break down releasing toxic bisphenol pellets which have been found floating in the world's seas and not absorbable in the natural biodegradation cycles. In March 2018, it was reported by the WHO commissioned study that small plastic particles were found floating in several brands of bottled water sampled from various parts of the world. The WHO report further recommended that people who have access to clean safe water should desist from using bottled water. Considering the large volumes of plastic waste that end in the water bodies, the impacts of the consumption of the pellets by aquatic fauna and people cannot be conceptualized at this point. According to Saido, 2010, plastics will certainly give rise to new sources of global contaminations that will persist long into the future. Whereas recycling is considered the best strategy of managing plastic, some countries incinerate or damp their plastics in landfills which are both destructive to the environment. Until January 2018, China has been recycling to the tune of about half of the globe's plastics waste [40]. This stopped because Beijing indicated that plastic waste from the West consists of hazardous chemicals that cause serious pollution in China during the recycling. It is in this vain that the legislation to govern the plastic industry on global scale, similar to international conventions of parties that deal with concerns like climate change, should be put in place. This is due to the fact that the plastic menace has become a global disaster that cannot be addressed by a few countries without involving all nations.

In addition to the above, the management of electronic waste disposal is a serious challenge for most nations in the world. This is as a result of a large percentage of the population shifting their activities into the digital realm. The adoption of e-governance, e-commerce platform and the mobile technology by the global community has occasioned a sharp increase in the manufacturing of electronic implements. The situation is exacerbated by the fact that most of electronic implements have a very short life, which demands that they are constantly replaced to be compatible with the changing times. For instance most computers' operating soft-ware normally becomes obsolete and incompatible within a given timeframe and must be updated. This ensures that consumers dispose their older implements for the latest compatible versions. It is for the reason that nations are churning out very large volumes of electronic waste. For instance, Kenya turns out 11400 tons of refrigerators, 2800 tons of personal computers, 500 tons of printers, 150 tons of mobile phones every year [41]. E-Waste poses a serious hazard to human health and the environment, especially when dumped in landfills or improperly recycled. The large volumes of the discarded electronic gadgets demand a sustainable strategy for their disposal be adopted. Failure to put in place contingency plans of disposal result in disasters like what has occurred in Guiyu in Guangdong province, a hub for the recycling of imported electronics waste, in China. Here, is located the largest e-waste dumpsite on earth. Consequently, about 90% of the children in the area suffer from Lead (Pb) poisoning and there are high incidences of miscarriages [40]. Whereas, recycling is considered the most plausible strategy in its management, it is imperative to note that in many countries in Africa, e-waste recycling is performed by the informal sector that utilizes un-procedural techniques such as burning to recover metals such as mercury, lead, copper and silver amongst others. This emits toxic fumes in the air and solid waste into aquatic bodies and soil, further causing environmental degradation and possing health risk. To address this, governments should adopt the environmental legislation, the polluter pays principles that stipulate that the party responsible for producing pollution be responsible for its safe disposal and also pays for the damage done to the environment. This environmental legislation is rarely enforced in many countries, especially in the developing world.

Meanwhile, as most people shift to the digital realm, the use of electronics that emit radiations has intensified. Such comprise; medical diagnostic radiology examinations and Cell-phones. Further, the proliferation of cellular antennas and other Radio Frequency (RF) generating devices has led to concerns about the potential health effects from exposure to RF radiation [16]. The short-term thermal effects of RF radiation on humans are well documented, but less is known about the long-term health effects [15,16]. Most people are continuously or intermittently exposed to radiations for extended period. This may be at home, in public, like in security scans in airports, workplaces and in medical settings. According to [15] WHO, ionizing radiation has sufficient energy to bring about destructive chemical changes in cells. WHO, adds that that the damaging of the cell DNA can result in cancer, cataracts, and potentially harmful genetic changes [15]. There is therefore increased risk for glioma, a malignant type of brain cancer which is associated with wireless phone use. The question to ponder is; could this explain for the escalated incidences of cancer in the human population? This is a fertile ground of research so that such concerns are comprehensively addressed. Amongst the most serious technological development that has posed serious disaster risks is in the generation of nuclear energy. This entails great highly scientific and technological applications that must be handled with specialized knowledge and skills. In the short history of nuclear energy there have been nuclear accidents that have surpassed any known disaster. Most of the nuclear meltdowns have been due to human error as considered in specific examples hereunder:

The Chernobyl nuclear disaster that occurred in Ukraine in 1986. Here, a reactor in the power plant exploded, resulting in more fallout than the Hiroshima and Nagasaki atomic bombs combined as observed by [42]. This was attributed to faulty design in the plant that caused a power surge in the reactor during a testing for emergency shutdown. To date, it remains difficult to determine the magnitude of the destruction occasioned by the disaster. Radiation resulting from the disaster was detected all over the world. It is estimated that it may cost up to $400 billion and will take up to hundreds of years to correct the damage [42]. The Chernobyl accident caused the death of more than 80000 people and to date about 35 million people have suffered ill health and about 135000 people have to be evacuated from around Chernobyl [42]. In 1979, a nuclear meltdown referred to as the 3 Mile Island Nuclear Explosion occurred in America. The nuclear plant experienced a partial meltdown, with release of radiation. Although less devastating from the immediate onset over time the 3 Mile Island Nuclear Explosion caused deaths and birth defects in livestock from the area. The accident stirred public protest and subsequently led the U.S. Nuclear Regulatory Commission to tighten its regulatory oversight over the industry, which hitherto was more liberal [16]. Nuclear accidents continue to occur and pose serious problems for humanity. For instance in the United States, the governments' accountability office reported more than 150 incidents from 2001 to 2006 of nuclear plants not performing within acceptable safety guidelines [16].This shows that while nuclear energy is clean and sustainable, the consequences of a meltdown can be devastating and wide reaching. Once more the impacts of such melt downs are slow setting hence consequences take long to manifest. The origin of the nuclear disasters have always been due to human error for instance the careless sitting of industries and lack of comprehensive regulatory framework.

Unsustainable use of water resource

According to [43] Mai-Lan, water is life. However, there is growing pressure on water resources due to population growth and the attendant human socio-economic activities; climate change; and pollution. Since water is a basic human right and its non-availability or its availability in poor quality, have undesirable consequences. For instance, water has been sited as a cause of human conflict in many parts of the world. The aforementioned is as a result of unsustainable utilization of the commodity by human kind, resulting in competition for the scarce supplies available. Ultimately, conflict results in political instability as the demand outstrips the supplies. Two examples of where this has occurred include:

The dispute over the Nile waters amongst the eleven riparian countries that include Egypt, Sudan, Ethiopia and Kenya amongst others. Divergent interests between upstream and downstream countries have brought negotiations on how to use the Nile waters to a standstill. This has pitied Egypt and Sudan against upstream riparians like Kenya and Uganda. The construction of a multibillion hydro-electric dam by Ethiopia on the Blue Nile just worsened the water conflict. On the other hand, in the Middle East, the Euphrates-Tigris rivers are shared amongst the nations; Turkey, Syria, Iraq and Iran. The unilateral development of irrigations projects by respective nations results in the change of the direction of water flows in this basin. This has occasioned what is commonly refereed to as the water wars, resulting in political tension amongst these nations. Various literatures indicate that, the deteriorating water scenario is likely to worsen with time [33,43]. This is attributable to the fact that the challenges affecting water utility are rooted in the unsustainable use of water, which focuses on developing new supplies and not conserving the existing resources. For instance the widespread deforestation in many parts of the world is responsible for decreasing forest cover and drying of rivers as considered under section 2.1. The encroachment onto the wet lands is yet another harmful development strategy that impacts negatively on the water catchments. Conservation of the water towers, reforestation and recycling strategies should form integral part of development. Therefore, it is imperative that all stakeholders focus on the preventive strategies in the management of water in order to forestall the adverse consequences of unsustainable use of this resource.

Civil strife and wars

One of the most serious disasters common in the world today is civil strife. Examples of such include the protracted civil wars in Yemen, Bangladesh, Nigeria, Ukraine, Democratic Republic of Congo (DRC), Syria, Zaire and Somalia, Afghanistan and in the then Yugoslavia amongst others. Existing literature indicates that civil conflict is almost exclusively a phenomenon of countries with low levels of economic development and high levels of food insecurity [44,45]. Meanwhile, 65% of the world's food-insecure people live in seven countries, thus: India, China, the DRC, Bangladesh, Indonesia, Pakistan and Ethiopia of which all but China have experienced civil conflict in the past decade [22]. To a large extent, internal conflict manifests political instability of nations. Such conflict is attributable to various factors such as food insecurity and dissatisfaction in the sharing of resources and inability of the governance systems to address populations' concerns. Further, in most of the internal conflicts, the governance system party to the conflict. Due to the aforementioned, such nations are reluctant to seek external assistance to address the crisis. Examples of this include the conflicts in Nigeria, Syria, DRC, Burma and Yemen. In Nigeria, the failure by the regime to address concerns on the sharing of the oil revenue in the Niger Delta has translated in the upsurge of internal conflict and radicalized groups. These have culminated into acute humanitarian crises with serious human fatalities and displacements. Regarding wars between nations, literatures indicate that the major

driver is related to territorial boundaries. Klare, further avers that the conflict this is focused on access to reproductive agricultural land or a common resource like water (This is also points to food insecurity as an underlying factor). Countries that share rivers water are more likely to go to war than are other countries that border one another. The probability of this occurring becomes higher if the two nations have: low levels of economic development; lack institutional and legal framework for resolving conflicts in this context. A case in point is the frequent conflict between nations that use the Nile waters, thus Kenya, Uganda, Ethiopia, Sudan and Egypt. Although these nations have not gone to war as a result of the said resource, there have been discontent regarding the 1929 Nile Waters Agreement which guaranteed not to interfere with the volume of Nile waters reaching Egypt. The treat was prepared by colonial governments who seem to have accorded Egypt undue advantages over the rest of the nations. This came out more clearly when Ethiopia decided to construct a multibillion renaissance hydro-electric dam, harnessing all the Blue and White Nile waters from Lake Tsana. Two nations, Sudan and Egypt have demonstrated their displeasure regarding this development. Scholars are observing very keenly how they will address the tension so that the potential first war over water in Africa is forestalled. In Cameron, the conflict pitting the Francophone against the Anglophone minorities is yet another example of where the economic repression has been cited amongst the triggers.

Civil strife occasions mass migration or displacement of populations. For instance many refugees risk their lives by crossing the Mediterranean in unsuitable motor boats due to civil strife in the Middle East. Ultimately, the displaced end up in refugee camps especially, in foreign countries. These are camps provide the bear minimum to address the crisis such people. Consequently, lack of water, sanitation, proper accommodation is a common feature. The consequences of this are disease epidemics, starvation due to lack of food supplies, and lack of shelter amongst others. In many instances, this translates into very high mortalities like is or was experienced in Yemen, Syria, the then Yugoslavia republic, Somalia and Ethiopia. In Mymmar, the civil strife in 2017 pitted the Burmese army against the Muslim minority who fled in mass to refugee camps. While in that camps there were outbreaks of very highly contagious disease, Diphtheria attributable to a collapsed medical infrastructure in the country. In Yemen, over 500,000 children have been killed or injured in the conflict (UNICEF, 2017). In Syria, 3.8 million refugees who had settled in the in refugee camps in Bekaa valley, Lebanon in 2017 and suffered massive fatalities due to extreme winters and poor sanitation that occasioned outbreaks of Cholera and Tuberculosis. Indeed these are disasters that can be avoided. An indirect outcome of the American invasion of Iraq in 2003 is the global insurgency being witnessed today. This was based on the allegation that Iraq had assembled weapons of mass destruction. This resulted in a widespread destruction of Iraq's infrastructure, which was condemned by the Arab nations. Arab nations including the Iraqis responded by arming themselves in the hope that they protect their national sovereignty. This destabilized the Arab nations to the extent that they could not provide for their citizens in many sectors. The population suffered extreme poverty, unemployment and blamed it on the corrupt and dictatorial regimes. This was a precursor to the uprisings that ensued, commonly referred to as the Arab Spring. This was a form of revolution that began in Tunisia in December 2010 and spread to most of the Arab nations. The results were the toppling of regimes in Libya, Egypt, Iraq; sustained uprisings, social violence and ultimately, civil wars. The riots were met with violent responses from authoritarian and dictatorial regimes, creating more dissatisfied communities in the affected nations. The population continues to agitate for their supposed rights creating protracted resistance which has not abated. To date, nations like Yemen, Syria and Iraq are still in civil turmoil with unprecedented human suffering and fatalities. The two major aforesaid events, the American invasion of Iraq and the Arab Spring, attributable to human actions, are considered as the main triggers of the existing global insurgency. Today, the Arab world is an embodiment of political instability in the world. Insurgency has evolved into radicalized terrorist groups such as the ISIS in Iraq, Alshsbab in Somalia, Boko Haram in Nigeria and Al kaida, all terrorize the whole world. Terrorism has metamorphosed into a global doctrine and spiraled into an unprecedented disaster risk. It entails the unlawful use of violence and intimidation, especially against noncombatant civilians in pursuit of political, social or religious goal (Oxford English Dictionary, 2017). Often, it is either used to provoke, avenge or influence the targeted and targets non-state groups yet others are funded by some governments [46]. In Nigeria, the Boko Haram are causing a lot of mayhem in the communities and abducting school girls who are used to as sex slaves. In the Niger Delta, reports of staff of the Multinational oil mining companies have been abducted and killed by such terrorist. In a nutshell, terrorism has become a global disaster. The existence of terrorism is detrimental to the society. This is a doctrine and cannot be fought by even the most sophisticated arms. The underlying, mainly socio-political causes must be considered in the strategy of addressing terrorism.

Diseases

Literature has linked the rising threat of disease epidemics and pandemics to various factors. These include amongst others: climate change; increased pollution; poor nutrition attributable to the food insecurity and microbial resistance [15,20,47]. The aforementioned are as a result of development activities as alluded under different sections in this article. For instance, climate change has occasioned alterations in the epidemiology of diseases due to changes in vectors, disease causative agents as considered under section 3.2. Regarding resistance to medicines, there is growing evidence that the wrong use of medications in humans and livestock and pollution have precipitated this. According to the UN Environment Frontier, about 700,000 people die annually due to resistant infections as the available drugs are not effective. This is attributable to various factors such as the release into the environment of the antimicrobial effluent from households, hospitals, pharmaceuticals facilities. In agriculture the agricultural waste and use of growth hormones to fast track maturation of livestock for food consumption has occasioned microbial evolution resulting in the emergence of more resistant strains. Apart from the general malpractices cited in the health and agricultural sector, environmental factors also predispose humanity to diseases. Such environmental factors include: water quality; sanitation; food insecurity; pollution and civil strife as considered under respective headings in this article. Sporadic outbreaks of these highly dangerous viral infections have continued to occur. For instance, more recently; the world wide outbreak of the severe acute respiratory syndrome (SARS) in 2003; the Ebola crisis in a number of the West African countries2014;Listeriosis in South Africa in 2018; the Lasaa fever in Nigeria in March 2018; and the HINI bird flu which affected many countries since the 1990s. As events continue to unfold, HIV AIDS pandemic is threatening the survival of the humanity. Regarding the Non Communicable Diseases (NCD) such as Cancer, Diabetes, Hypertension, their prevalence has also escalated. Globally, Cancer is claiming more lives to the extent that in March 2018, a Kenyan legislator tabled a motion in parliament to compel the government to declare it national disaster. From the considerations aforementioned, the increased prevalence of diseases is an indicator of a permanent threat to human health on global scale.

Strategies to eradicate or manage them have not realized long term positive outcomes. Unfortunately, all manifest some elements of human intent, omissions or negligence.

Conclusion and recommendation

From the considerations discussed, it is evident that the increased incidences, intensities and scope of disasters are not entirely attributable to natural causes. Therefore, development should focus on strategies to prevent, reduce and prepare for possible disasters. This is in line with the provisions of the Hyogo Framework for Action (HFA) 2005-2015, that disaster risk reduction in sustainable development should be integrated at all levels, encompassing disaster planning, mitigation, preparedness and vulnerability reduction [48-50]. This can be realized if there is political commitment at national, regional and global levels which should be enshrined in the institutional and regulatory frameworks. The latter is because disasters don't only affect a given community or nation but are often beyond national boundaries. For instance the impacts of climate change, pollution, food insecurity, disease epidemics go beyond national and some extent, regional boundaries. Therefore to effectively address disasters, there should be collective action by all stakeholders. A case in point is for instance, when Kenya banned the use of plastic bags, unscrupulous traders continue to access the same from Uganda, negating the achievements of what was envisaged. Further, when nations like America are least prepared to be party to the resolutions of Kyoto Protocol and Paris agreements, it is impossible to achieve the envisaged objectives. All nations in the world should collectively address disaster risks, failure to which very little progress can be made in this direction, especially if individual countries are left as independent actors.

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