Situation Analysis of Somalia’s 2011 Famine

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Situation Analysis of Somalia’s 2011 Famine

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For any errors or inadequacies that may remain in this work, of course, the responsibility is entirely my own.
## Table of Contents

Abstract .............................................................................................................................. 4

Introduction ......................................................................................................................... 5

Purpose Statement ............................................................................................................. 5

Literature Review ............................................................................................................... 5

Methods ............................................................................................................................. 17

Situation Analysis .............................................................................................................. 19

Discussion .......................................................................................................................... 33

Limitations .......................................................................................................................... 37

Conclusions ......................................................................................................................... 38

References ........................................................................................................................... 39

Appendix A: Tier 1 Core Public Health Competencies Met .............................................. 46
Abstract

This CE examined the contributing factors of famine in Somalia and developed a situational analysis of Somalia’s 2011 famine. The situational analysis was developed using health and famine indicators. Data from geographic information system (GIS) was also used to supplement analysis to look for trends and patterns of the famine. I predicted that conflict was the leading factor in Somalia’s 2011 famine. I concluded that conflict exacerbated the famine situation in the south of Somalia but in the north (Somaliland) famine was due to climate and lack of permanent rivers and water sources.

*Keywords: situational analysis, famine, geographic information system, Somaliland and Somalia*
Situation Analysis of Somalia’s 2011 Famine

A famine is widespread scarcity of food and is true public health emergency which is a far too common experience throughout human history. Famine is influenced by many factors including population increase, crop failure, or conflict, which leads to civil war or anarchy. It is usually escorted by regional starvation, hunger, disease epidemics, and high death rate. Historically nearly every region of the world has seen a period of famine. Many regions still endure life-threatening cases of starvation and famine (McCann, 1987). Food production weakens following successive years of famine whether brought about by poor climate conditions, war, or both.

Government policy is an important determinant if these conditions mature into widespread famine. The African continent has experienced recurrent famines, some of which are caused by civil wars, scarcity of water, lack of skilled people, and good agriculture infrastructure. Sound agricultural policy development and civil peace is required to decrease Africa's susceptibility to famine (Mellor & Gavian, 1987).

Purpose Statement

The purpose of this CE was to investigate the contributing factors of famine in Somalia and develop a situation analysis of Somalia’s 2011 famine.

Literature Review

Famine has been an ongoing issue throughout history and has been reported from all around the world, but it strikes Sub-Saharan African countries the hardest especially in the non-rainy seasons. With the collapse of food reserves, depletion of water, civil wars, and failed crops starvation and malnutrition affects millions of people in Africa. The famine in Ethiopia in the
1980s had a high mortality rate, although Asian famines of the 20th century also had high death tolls (Clover, 2010).

In spite of the fact that there have been many recorded famines over the last few centuries, food production in many parts of the world has improved, and global food production is adequate to feed the current world’s population. On the other hand, the number of countries experiencing severe food shortages has almost tripled since 1990 (Harrison, Disogra, Manalo-Leclair, Aguayo, & Yen, 2002). It is not a shortage in the total amount of food that causes famines; the cause is unequal distribution. Most famines are preventable by implementing famine preparedness policies for an entire region such as taking care of resources and saving them for the dry seasons. International law has recognized access to food as a basic human right (United States Department of Health and Human Services, Public Health Service [USDHHS, PHS], 1992).

In July 2005, the Famine Early Warning System Network was created for the predicting famine and food security-related events in Africa and Asia where famine remains chronic threat. Funded by the United States Agency for International Development (USAID), it examines a variety of information and databases, such as precipitation, market prices of food, and crop failures to predict the geographical areas with food deficiency and then issues alerts (United States Geological Survey [USGS], 2012). In 2006, this system tagged many countries such as Niger, Somalia, South Sudan and Ethiopia with emergency status. In January 2006, the Food and Agriculture Organization (FAO) alerted 11 million people in Djibouti, Somalia, Ethiopia and Kenya who were at risk of famine caused by a combination of dry climate and conflicts (Northoff, 2008). Famine results in decline of food consumption, which results in malnutrition and chronic weight loss leading to increased mortality (Walker, 1989).
Causes of Famine

Famine can be caused by a number of factors including drought, poverty, armed conflict, and economic stress. Agriculture remains the main industry in most African countries. People have been growing more cash crops instead of staple food crops. Kenya, for instance, has advocated the growing of coffee, flowers and tea, products that can be exported for foreign exchange revenue instead of planting staple crops that could promote self-sufficiency in food (Quigley & Raphael, 2008).

One of the fundamental sources of famine is crop failure, which weakens the incomes of the poor. The most obvious basis of crop failure is bad weather or civil disruption or both. These underlying influences can be aggravated by market disruptions due to inflation, hoarding, war or changes to income distribution (Mellor & Gavian, 1987). A study completed by Sen (1981) showed that lack of capital to purchase food could intensify a famine.

Another factor that causes famine is successive years of poor crop yield. Famine does not arise from a single bad growing season. History also shows that a consecutive year of crop failure leads to disaster, for example in 1966 and 1967, droughts and floods struck India, causing two successive years of crop failure (Masefield, 1967). Food grain production fell from its pre-drought high by roughly 14 percent each year. In the northern Indian state of Bihar, farmers switched from growing rice to maize because maize was more drought resistant (Nossiter, 1967). However, in 1967 even the hardier maize crop could not compensate for the rice crop failure, consequently its production fell as well. Recent famine in Africa shows a similar pattern. The 1974 famine that struck states near the Sahara desert was the culmination of successive years of poor crop yields and weather. In 1983 and 1984, drought and civil war crippled Ethiopia and
SITUATION ANALYSIS OF SOMALIA’S 2011 FAMINE

Sudan (Dercon et al., 2010). Although in 2011 Somalia’s famine was an aggregation of many factors, the successive years of crop failure was the main cause.

Increasing cost of food is another leading cause of famine. Many Africans countries do not have enough capital to buy food because of its skyrocketing prices. In recent years, rising international food prices has exacerbated food shortages in Africa. High prices of food have plunged many African countries into food emergencies. More than half of the 54 African countries suffer food shortages. In the past few years, soaring food prices have ignited unrest in numerous countries including Sub-Saharan countries (Viatte, De Graaf, Demele, Takahatake & Rey de Arce, 2009). Unstable agricultural production often sends grain price to the roof. The poor can’t afford to buy food when the prices rise. During famine because the consumer demand for meat collapses the market, farmers and herders sell off their cattle so that they can purchase cheaper grain calories which further worsens the famine. One of the factors that exacerbate famine is increasing poverty rate and unemployment. With less farming activity, landowners do not hire as many farm laborers, which in return increase poverty and malnutrition (Sen, 1981).

Another factor that exacerbates famine is the increasing population. Rapid population growth is one of the major reasons for food shortages in Africa. African population has changed a lot in the past 100 years, and population increased from 141 million in 1900 to 278 million in 1960, and reached more than 1 billion in 2010. The population growth in Africa has far outpaced increases in food production in the African continent. A FAO report described that population explosion led to an increase in the number of undernourished people in the sub-Saharan region from 169 million in the early 1990s to 212 million in 2000s (Zhongxiang, 2011).

Government policies play an important role in accelerating or preventing famine. Better governmental policies can limit or offset any natural disaster, which could evolve in famine. In
southern Somalia, the lack of government policies promoted armed conflicts and heightened vulnerability to famine. Armed conflicts coincided with drought conditions in Chad, Ethiopia, Angola Eritrea and Somalia during the famines of 1983 and 1984. The worst hit was the region bordering Ethiopia and Eritrea who were at war with each other. The people in this region suffered because the Ethiopian government tried to put a blockade on this region to weaken the Eritrean militia. However, it is not clear whether the blockade was intentional or an after effect of the war (Mellor & Gavian, 1987). In contrast, positive governmental policies can break the cycle of famine. For example, recent tax breaks given to farmers, who were suffering from drought in the South of the United States provided them much needed financial relief.

According to Sen (1999), only five to ten percent of a country’s population suffers from starvation in a typical famine, so by distributing the available food differently death can be avoided. There are several examples of countries that have exported food during famines. The explanation of this strange phenomenon is that the local market for quality foods, such as meat and fish, collapses during a famine, since people prefer to buy cheaper staple foods. Therefore the price of staple foods rises dramatically, while the demand for quality foods decreases. Producers of quality foods discover they can export their products and thereby earn more money, which they can use for buying the now expensive staple foods at home.

Sen (1999) claims the reason famines occur only in non-democratic societies is that famines are rather easy to prevent (by redistributing the available food in the population), and that democratic leaders aiming at re-election typically are much more motivated to take preventative measures against famine than are dictators, who have nothing to fear from hungry voters. In a democracy, hungry citizens may exercise the right to choose their leaders, and leaders know this and the smart ones act upon it and have a contingency plan.
Health Indicators in Famine

Famine is more than just a title or a label; it has a particular set of criteria and thresholds that are met before attaching the “famine” label. Famine exists at the extreme end of the food security assessment scale. In addition, deaths (mortality), malnutrition, disease epidemics and other indicators are also used to evaluate a population’s capability to access and acquire food. The Integrated Food Security Phase Classification (IPC) scale is an indicator from the United Nations (citation here), which ranges from Phase 1 to Phase 5.

- Phase 1: No Acute Food Insecurity
- Phase 2: Stressed
- Phase 3: Crisis
- Phase 4: Emergency
- Phase 5: Catastrophe

Key measurements on the IPC are death rate, malnutrition, availability of water, food consumption, hazard and vulnerability (Lawry, 2009). The table below is the Integrated Food Security Phase Classification (IPC) used to classify the severity of famine (FAO, 2006).
Table 1

*The Integrated Food Security Phase Classification (IPC)*

<table>
<thead>
<tr>
<th>Phase</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Generally Food Secure</td>
</tr>
<tr>
<td>1B</td>
<td>Generally Food Secure</td>
</tr>
<tr>
<td>2</td>
<td>Moderately / Borderline</td>
</tr>
<tr>
<td>3</td>
<td>Food and Livelihood Crisis</td>
</tr>
<tr>
<td>4</td>
<td>Humanitarian Emergency</td>
</tr>
</tbody>
</table>

Source: Food and Agriculture Organization [FAO], 2006, pg. 4

Health indicators can be used to indicate change over time regarding public health problems and to assess the extent to which the objectives of a program are being achieved. Health indicators may include measurements of illness, disease, positive aspects of health (such as quality of life, life skills, or health expectancy), and of health related behaviors and actions by individuals. Variables used to measure health indicators in famine are many and some of these indicators are listed in Morbidity and Mortality Weekly Report in 1993 (Centers for Disease Control and Prevention [CDC], 1993).

Crude Mortality Rate (CMR) is one of the indicators to measure the severity of famine and represents the number of people who have died in a given time period. The accepted emergency level is when the baseline of CMR is doubled, or when it is in surplus of 1 death/10,000 people/day (Mills et al., 2008).
Effects of Famine

Public health.

The number of deaths caused by famine is astronomical; these numbers include the Great Bengal Famine, 1769-1770 which caused 10 million deaths; during the 1876-1878 famine in India five million people died; the 1877-1878 famine in North China killed nearly ten million: the Bengal famine of 1943, in which one and a half million died; and the recent famine in Biafra 1967-1975) in which one million perished (Gwatkin, 1980).

Niger is known for its recurring drought and in 2005 the media brought attention to a worldwide food and nutrition crisis in Niger. The United Nations estimated that two and half million people in Niger who lived in farming and grazing areas were vulnerable to food insecurity. To ensure a balanced and appropriate response, the Government of Niger and the United Nations Children Fund (UNICEF) with the Centers for Disease Control and Prevention (CDC) managed an emergency study that measured the extent of starvation and illness among the vulnerable population of Niger. A MMWR report summarized the outcomes of the survey confirming famine and disease outbreak among children aged 6–59 months (CDC, 2006). They also reported that among children aged 9–59 months, 33.7% had not been vaccinated for measles. Health officials in Niger took immediate action to improve accessibility of vaccination, food, increase availability of medical treatment (CDC, 2006). Davies and Wheatcroft (2004) noted “famine needs to be understood as a complex of separate crises that jointly contributes to leaving a dangerously low supply of food for certain groups of the population. The urban population and groups of Kazakh nomads were the most at risk” (pg. 107-136). In 1931 severe grain collection policies shifted the occurrence of the famine to create suffering in rural areas of
Ukraine. Extremely high death tolls were evaded only by releasing grain reserves (Davies & Wheatcroft, 2004).

Hoch (1998) reported on famine, disease, and mortality patterns in the parish of Borshevka, Russia in 1830-1912. He said that morbidity rates must have been high, and the young in Borshevka likely experienced repeated bouts of both acute and persistent diarrhea. The pattern of mortality evident in the parish was distinguished by an extremely high incidence of infant diarrheal diseases (Hoch, 1998).

Famine can affect health status in numerous ways; it can affect population nutrition levels, thus bringing short term or long-term consequences. Short-term consequences could be the malnutrition level of the society. Severe malnutrition in children has dire consequences such as death (Schwekendiek, Pak, & Kim, 2009) showed variation of height attainment in the two Koreas due to the effect of famine in the North in 1994 to 1998. Researchers investigated South Korea and North Korea’s birth-season-height patterns during the famine. The result showed that North Koreans had more abnormal or stunned growth while South Korean birth season height pattern was consistent with other patterns reported globally. The result of this study suggests that adverse conditions during the famine are probable factors that result in the abnormal height pattern in North Koreans born during the famine. Very likely, the famine conditions in North Korean have stunned the birth height of North Koreans (Schwekendiek et al., 2009).

Long lasting drug and food shortages coupled with a shattered economy and health-care system took a heavy toll on the health of North Korean’s children. North Korea’s infant mortality rate increased and the mortality rate for 5-year-old age group also increased. Infant mortality rate increased from 9 deaths per 1000 live births in 1990 to 23/1000 live births in 1999. The under 5 years old mortality increased from 30 deaths per 1000 in 1990 to 55 / 1000 in 1999.
In 1999, almost 25% of North Korean children had low birth weight, and 62% of children younger than 7-years-old had stunted growth due to lack of nutrient rich food. In addition, diarrhea morbidity increased to as much as 20% as water accessibility decreased (Robinson, Ken Lee, Hill, & Burnham, 1999).

Galler et al. (2001) reviewed the current long-term effects of famine on cognitive and behavior development. He said “malnutrition experienced at young age will have lifelong consequences that are not reversed” (Galler et al., 2001, pg. 309). Even after a long period of recovery, lasting effects of prenatal, postnatal and childhood malnutrition have been reported.

Galler et al. (2001) summarized the results of a study in Barbados in which individuals, now 28–34 years of age, experienced some form of malnutrition during their first year of life. The study concluded that malnutrition affected negatively the cognitive and behavioral development throughout childhood and adolescence, even after controlling for factors such as socioeconomic conditions and home environment. They concluded that cognitive and behavior deficits that arise from famine and malnutrition can be reversed, if comprehensive interventions are implemented early. The lack of appropriate response and interventions will have behavioral and functional deficits continue long beyond the incident, and consequently, impact the quality of life of the survivors.

Researchers found that effects of famine are observed during pregnancy due to fluctuation of iodine and thyroid hormones. Iodine is a trace element essential for the synthesis of the thyroid hormones. These hormones play a very important role in the early developmental and growth stage of most organs, especially the brain. Sufficient quantities of iodine are required at the time of pregnancy to prevent the development of fetal disorder, those quantities are hard to maintain in famine stricken lands (Perez-Lopez, 2007).
Nutritional conditions in early life may causally affect health at older age. A study completed in Netherlands by (Portrait, Teeuwiszen, & Deeg, 2011) found that prevalence in heart disease; peripheral arterial disease and diabetes were high on older adults who experienced famine when they were adolescents. The research indicates that exposure to severe malnutrition for ages 11 to 14 was significantly associated with a higher probability of developing diabetes and peripheral arterial disease. This association was found only in women but not in men. It highlights that adolescence is a critical period with respect to exposure to adverse nutritional conditions and is relevant in famine stricken countries such as Somalia.

In a study conducted in the year 2010 about hypertension and diabetes prevalence in sub-Saharan Africa. Researcher stated that fetal and infant under nutrition is significantly associated with increased risk of hypertension and impaired glucose intolerance in Sub-Saharan Africa. Prevention of under nutrition during pregnancy and infancy should be given high priority in health education and economic agendas (Holt, Barnby, & Maestrini, 2010).

In a study to measure long-term health consequences, 2,414 people born around the time of the Dutch famine after World War II were found to suffer from glucose intolerance, coronary health disease, and disturbed blood coagulation. These were all associated with exposure to famine during any stage of gestation. These findings also showed that maternal under nutrition during gestation have important effects on health and early gestation seems to be a vulnerable time period (Painter et al., 2005).

Deterioration of mental health is also another health long term consequence of famine. Hock et al. (1998) found that early prenatal famine was associated with congenital anomalies of the central nervous system, schizophrenia, and schizophrenia spectrum personality disorder. In a study conducted on Somali refugees in Minnesota, Kroll et al. (2008) showed increase in
posttraumatic stress disorder, depression, and other mental disorders in patients that experience war trauma and malnutrition in childhood.

**Society.**

The effect of famine is so widespread that Sobek et al. (2009) stated that food scarcity increases the risk of civil war onset. They suggested that poor states are more likely to experience civil conflict. This study showed that regions lacking sufficient provisions of food are at higher risk for internal conflict, even if those regions are somewhat wealthy. In addition, food deprivation exacerbates the risk of civil war in states that export large amounts of resources that could be stolen and help fund the guerilla forces and these resources also would increases civil war duration (Sobek et al., 2009). The World Developmental Report of 2011 stated that food insecurity increases several forms of internal conflicts such as political violence, regime instability, violent protest, communal conflict, and riots (World Bank, 2011).

Food insecurity has been associated with civic unrest, protests, and rioting in developing countries. The connection between conflict and food insecurity is less clear, though there is some historical evidence connecting episodes of war and civil unrest to decreased agricultural productivity (Brinkman & Hendrix, 2011). Effect of famine increases violence and other atrocities such as rape, and theft increases due to desperation and lawlessness. For instance cattle stealing was associated with a breakdown of civil order caused by famine in Karamoja, Uganda, during 1980 (Biellik & Henderson, 1981).

**Environmental effects.**

Environmental effects of famine include poor sanitation. Sanitation generally refers to the condition of facilities and amenities for the safe removal of human excrete. Poor sanitation can propagate infectious diseases like diarrhea and improving sanitation has positive impact on
health both in households and in the community. The World Health Organization (WHO) warns of high risk disease outbreaks in the famine-affected areas because of poor sanitation and lack of clean water (Loewenberg, 2011). Lack of clean water causes diseases such as cholera, typhoid and childhood diarrhea (World Health Organization [WHO], 2012).

Wildfire is one of the environmental consequences of famine. Higher temperatures increase the amount of moisture that evaporates from land and water, which causes rainfall patterns to shift. In many areas, these changes lead to more frequent and severe droughts, which occur when an area receives less water than usual. The low moisture and precipitation creates ideal conditions for drought, which sets the stage for wildfires that burn forest and cause injuries or deaths as well as extensive damage to property and food supplies. In an article, Enfield and Fernandez-Tejedo (2006) note that severe or prolonged drought ranks among the most devastating and calamitous of all extreme climate events, contributing to wildfires in additions to famine.

Methods

An extensive review of the existing literature on famine was performed. Relevant literature was identified through searches of three peer reviewed literature databases (Pub-Med, Academic Search Complete, and Google Scholar). The search terms included were “famine” “cause of famine”, “effect of famine”, “recent famine”, “African famine” “Somalia famine”, “famine indicators”, “famine health status”, “famine mortality and morbidity”. News information about different aspects of mortality and morbidity rates along with health and health services were also collected from peer reviewed articles and humanitarian non-governmental organizations’ (NGO) websites.
In the second part of this review, the framework of situation analysis was used to analyze famine in Somalia. Situation analysis is a research method used to analyze the situation or organization in order to understand the capabilities and environment. As described by International Union for Conservation of Nature (IUCN), a situation analysis is the systematic study and gathering of past and present data to discover trends, patterns, and conditions with the potential to influence policies and the choice of appropriate strategies (International Union for Conservation of Nature [IUCN], 2012).

The World Food Programme (WFP) famine indicators (WFP, 2012) were used to compare the severity of famine in Somalia to other regional neighboring countries. WFP provides an overview of food security trends such as food consumption/availability/prices, purchasing power, malnutrition and rainfall and food production. It is based on reports which capture the impact of economic, social and ecological trends, updates from WFP’s regional and country-based Vulnerability Analysis and Mapping (VAM) units and a review of secondary information (WFP, 2012). WFP data were compared and analyzed for famine situation in Somalia, Ethiopia and Yemen. These countries were chosen due to their proximity and similar geopolitical and climate conditions as Somalia.

Conducting a comprehensive situation analysis is a public health exercise because it can be seen as a preliminary step in order to implement disaster preparedness planning and policy recommendations. It provides the current information needed for effective health planning and management.

The objective of using the situation analysis framework was to identify and highlight the priority problems related to famine in Somalia so that strategies for planning and addressing these issues could be developed. Geographic information system (GIS) was used to supplement
situation analysis. GIS was used to present geographical, geo-political and demographic data in maps. The table below is the list of GIS maps used in the situational analysis of Somalia’s 2011 famine.

Table 2

*GIS Maps for Situation Analysis*

<table>
<thead>
<tr>
<th>Map</th>
<th>Type of information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-demographic</td>
<td>Population distribution</td>
</tr>
<tr>
<td></td>
<td>Health and human services</td>
</tr>
<tr>
<td>Economic activity</td>
<td>Road infrastructure</td>
</tr>
<tr>
<td>Famine situation</td>
<td>Land usage</td>
</tr>
<tr>
<td></td>
<td>Permanent and non permanent water stream</td>
</tr>
<tr>
<td></td>
<td>Famine situation</td>
</tr>
<tr>
<td>Political structure</td>
<td>Conflict hot-spots</td>
</tr>
<tr>
<td></td>
<td>Political administration</td>
</tr>
</tbody>
</table>

**Situation Analysis**

**Current Situation**

Somalia has a population of 10 million inhabitants (Central Intelligence Agency [CIA], 2012). The capital city is Mogadishu, which is located in the southern part of Somalia. Spoken languages are Somali and Arabic (both official). Somalia is located in Eastern Africa, bordering the Gulf of Aden and the Indian Ocean. Countries that share international borders with Somalia are Ethiopia, Kenya and Djibouti. The Red Sea and the Indian Ocean are to the north and east of
Somalia. The total area of Somalia is 637,657 square kilometers, slightly smaller than Texas.

Figure 1 is map of population distribution.

![Population Distribution Map of Somalia and Somaliland](image)

**Figure 1**

The Distribution of Population of Somalia and Somaliland

Due to the proximity to the equator and as member of the Sub-Saharan region, there is little variation in its seasonal climate. The climate conditions in Somalia range from arid in the Northeastern and Central regions to Semiarid in the Northwest and South. Warm and hot conditions are the norms year-round along with episodes of irregular rainfall and monsoon winds. The daily temperatures range from 86°F to 104°F, except along the Eastern seaboard and at higher elevations (Hadden, 2007).
Throughout the year, the weather is hot and rainfall is light. Usually the country receives less than 19.7 inches of rain annually, and in the Northeast, where its more desert like, annual rainfall is as little as 1.97 inches to 5.91 inches annually (Hadden, 2007).

After more than 20 years of conflict, Somalia has approximately 1.46 million internally displaced persons (IDPs) as of 2011 (Office for the Coordination of Humanitarian Affair [OCHA], 2011). At least one million Somalis live in the diaspora, most Somalis are concentrated in three main areas: the Horn of Africa and Yemen, Western Europe and North America and the Gulf States.

**Governance**

For the last 20 years, Somalia had no stable government to appropriately administer the country’s infrastructure. The civil war has had a destructive consequence on infrastructure in most of the regions in Somalia. Some parts of Somalia, especially Somaliland made some improvement because of the relative calm and stability established in this region. Somaliland has made advancement in putting in place legislation and institutions to manage their infrastructure with support provided by Non-Governmental Organizations (NGOs) European Union and other donors. Figure 2 is a map of current administration boundaries of Somalia and Somaliland.
Since 1991 there has been no central government control over the country. The United Nations recognized an interim government, which only controls a few blocks in Mogadishu (Capital) and warlords control the rest of the southern Somalia. In the North, the former British colony broke away from the rest of Somalia and called itself Somaliland. On the other hand, Somalia is widely viewed as a political and humanitarian disaster; Somaliland has put together a moderately stable government and held few elections that have been stated as free and fair by observers. As a result Somaliland has elected officials that represent each part of the country and
also a president. They have been tirelessly fighting to be recognized by the international community but they are still unsuccessful.

**Current Health Status**

Somalia’s health infrastructure is small, concentrated in urban areas where its more secure, mainly in well populated towns. Health infrastructure is in a very poor state, because of decades of conflict and lack of maintenance. In 2006, there were 144 Mother Child Health (MCHs) Clinics, 26 TB Centers, 23 Hospitals, 14 Outpatient Departments (OPDs), 35 MCH/OPDs, 350 Health Posts, 13 Health Mobile Units, and 43 Malaria Centers. Non-Governmental Organizations and United Nations agencies support almost all health facilities. The health workforce is small, under skilled, ageing, usually forced to work in an insecure environment and often underpaid (WHO, 2006). Table 3 shows health comparison indicators and Figure 3 is a map of health facilities and clinics distributed across Somalia and Somaliland.

**Table 3**

*Health Indicator Comparison Table*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Expectancy at Birth</td>
<td>44</td>
<td>46.2</td>
<td>46.9</td>
<td>47.3</td>
<td>63</td>
<td>76.9</td>
</tr>
<tr>
<td>Infant Mortality Rate/1000</td>
<td>152</td>
<td>132</td>
<td>122</td>
<td>113</td>
<td>74</td>
<td>6.9</td>
</tr>
<tr>
<td>Probability of dying before 5th birthday/1000</td>
<td>225</td>
<td>224</td>
<td>225</td>
<td>187</td>
<td>102</td>
<td>8.2</td>
</tr>
<tr>
<td>Maternal Mortality Rate/100000</td>
<td>-</td>
<td>1100</td>
<td>-</td>
<td>1600</td>
<td>365</td>
<td>12.1</td>
</tr>
</tbody>
</table>

*Source: (WHO, 2006)*
Figure 3

The Distribution of Health Facilities and Clinics in Somalia and Somaliland

Accurate data on mortality and morbidity is difficult to obtain in Somalia due to the lack of a functioning government that monitors the health surveillance system (WHO, 2006). Somalia has some of the worst health indicators in the world with vaccination rates where only 10.6% of all children less than one year and 27% of children less than five years fully immunized against all the childhood diseases. In comparison the percentage of children immunized in a developed country like the USA is 75%. A constant lack of food with low quality diet, poor feeding practices, and inadequate home environment (mainly due to successive droughts and conflicts) contribute to many children being inadequately nourished (WHO, 2006).
Famine Situation in Somalia

As defined by the World Food Summit of 1996, people are considered food secure when they “have all-time access to sufficient, safe, nutritious food to maintain a healthy and active life” (FAO, 1998, pg. 1). Food security analysts look at the combination of the following elements: malnutrition, food prices, food availability/consumption/access and rainfall (WHO, 2012). Figure 4 is a land use map of Somalia and Somaliland.

Figure 4
Agriculture Land use of Somalia and Somaliland (Metcalfe, 2012)

The Somalis use rain-fed water to irrigate dry-land farming or sometimes complementing by irrigation from the waters of the Shabeelle and Jubba rivers. Only 1.6% of
Somalia's total land area is cultivated and 69% is permanent pasture mostly on the Southern end of Somalia (Somalia, 2012). Figure 5 is a map of inland water distribution and Figure 6 is a famine situation analysis in Somalia and Somaliland.

**Figure 5**

Inland Water Distribution and Rivers of Somalia and Somaliland
The effect of 2011 famine in Somalia has left an estimated 11 million people at risk and caused increased mortality, morbidity and the highest mortality rate for children under age five, according to data released by the United Nations (UNCHR, 2012). Somalia's child mortality rate in 2010 stood at 180 deaths per 1,000 live births. In the summer of 2011, 3.5 million faced starvation and in the Southern part of Somalia they were 310,000 acutely malnourished children (UNHCR, 2012). The harsh disease environment, which results in elevated rates of early childhood and infant mortality are closely related to fertility levels, housing conditions,
household size, weaning practices, related from annual or seasonal food availability and the nutritional status of the population (Hoch, 1998).

Malnutrition is used to measure the status of famine because it assesses the healthy weight of the population, which is indirectly proportional to food availability, access, and consumption of the affected population. The threshold at which an emergency is declared is when the prevalence of Global Acute Malnutrition (GAM) in the population is 15% (Bilukha & Blanton, 2008).

Another way to assess the famine situation is rainfall and food prices. Rainfall affects food availability and access, which in return affects the price of food. For food prices to fall food must be available in sufficient quantities and it must be easily acquired through purchase or home production (WFP, 2012).

The United Nations World Food Program (WFP) monitors global food security and publishes information about food security trends biannually. They collect data on food consumption/availability/prices, purchasing power, malnutrition and rainfall and food production. The WFP report also references the impact of economic, social and ecological trends based off of WFP’s regional and country-based Vulnerability Analysis and Mapping (VAM) units (WFP, 2012).

In its June 2012 issue, the WFP reported that situation of famine in Somalia and Ethiopia famine has improved. The total population affected by famine in Somalia has decreased from four million in 2011 to approximately 2.5 million people in 2012. However, the majority of affected population in Somalia and Ethiopia are still in “Crisis” (IPC Phase 3). Phase 3 “Crisis” is described by the IPC scale as “when the household experiences short term instability and significant food consumption gaps with high or above usual acute malnutrition” (FAO, 2006, pg.
4). Improvements in food security were due to a relatively good rainy season, considerable off-season cereal harvest, cash crop activities and humanitarian support leading to improved food access in most areas. Future improvement in famine will greatly depend on the rainfall, the continuation of humanitarian support and the political stability in the country.

In Ethiopia agriculture is the foundation of the economy, employing 80% of the country’s 82 million people and yet 4.5 million people were in need of emergency food assistance. WFP handled 30 to 40% of national food distributions in 2011 famine (WFP, 2012). Overall, Somalia and Ethiopia were experiencing a better food situation in 2012 compared to 2011; food security was on upward trajectory compared to the downward spiral observed in Yemen.

In Yemen, nearly half of the population (44.5%) was found to be food insecure. The number of severely food insecure people increased by 87 percent since 2009, reaching 22 percent of the population. Rising food and fuel prices are explained by the increased conflict and civil unrest since 2011. Households are confronted with reduced market access, reduction in basic social services, high fuel and food prices (WFP, 2012). Table 4 is a food security trend table.
Table 4

*Food Security Trends, 2010-2012*

<table>
<thead>
<tr>
<th>Country</th>
<th>Food Consumption/Availability</th>
<th>Prices</th>
<th>Purchasing Power</th>
<th>Malnutrition</th>
<th>Rainfall &amp; Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somalia</td>
<td>Good</td>
<td>↓17%</td>
<td>Increased</td>
<td>Decreased</td>
<td>Good</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Somalia</td>
<td>Good</td>
<td>↑80%</td>
<td>Decreased</td>
<td>Increased</td>
<td>Reduced in southern and central regions</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Good</td>
<td>*</td>
<td>Decreased</td>
<td>Remained</td>
<td>Abnormal in many stable parts</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Good</td>
<td>↑17%</td>
<td>Decreased</td>
<td>Remained</td>
<td>Abnormal in many stable parts</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yemen</td>
<td>Poor</td>
<td>↑29%</td>
<td>Decreased</td>
<td>Poor</td>
<td>Unstable due to civil unrest</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yemen</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>


Source: WFP, 2012
Socioeconomic Status and Urban Infrastructure

Urban infrastructure that was partly destroyed in the civil war remains inadequate and poorly maintained; this contributed to a sharp drop in living standards in many Somali cities and towns. Unemployment is estimated to be over high 80% in most cities and 43% of the Somali urban population lives in extreme poverty with 61% living on less than US $2 a day.

Transportation infrastructure of Somalia comprises of little more than 13,600 miles of roads, 15 major airfields (four of which have paved runways), four major ports and no railroads. There are no pipelines to bring water in from water reservoir or in land waterways to homes or community centers. People fetch water from wells or harvest rainwater. Development of transport structure since the 1980s has been nonexistent. Somalis continue to use roads as their principal mode of internal transportation. For many in the rural and in the urban areas, animals (camels and donkeys) continue to be the most important and/or only means of conveyance for many of the poor. Figure 7 is a map of current road network in Somalia and Somaliland.
Security

Since 1991 Somalia has witnessed significant change in its political and economic situation. Though it remains a collapsed state, it is a very different setting today than it was five or ten years ago. South Somalia remains unstable and dangerous for international aid agencies. Pockets of security and stability exist in the south, but are not safe due to sudden armed clashes of different tribal militias or political groups against aid agencies or water holes.

Figure 8 is a conflict map, where only conflict against civilians are counted. Somaliland (the Northern zones of Somalia) is peaceful and enjoying much higher levels of stability and
administration as compared to Somalia. Somaliland has successfully managed several milestones in the past two decades, including a writing a constitution and closely peaceful race in the local and presidential elections.

**Figure 8**

Conflict Point Distribution in Somaliland and Somalia from 2010 to 2012

**Discussion**

The aim of this culminating experience was to describe factors related to famine and to perform a situation analysis to find out possible relationships between conflict, climate, and general environment in the Somali famine of 2011. This famine was one of the worst famines to hit the region in the past 60 years.
Famine in Somalia is not just a natural calamity but rather the product of human-made factors such as, lack of governance, political instability, conflict, which undermined traditional coping strategies that have evolved over generations in response to the natural hazard of drought. Man-made calamities such as land degradation and deforestation have had a short to long-term impact on weather and climatic conditions (Corbett, 1988).

The Intergovernmental Panel on Climate Change (IPCC) Report (2012) stated that the Horn of Africa droughts were recorded every six to eight years before early 2000s, but now since 2008 they occur every one to two years. Meteorological data show that mean annual temperatures increased between 1960 and 2006 by 1°C in Kenya and 1.3°C in Ethiopia; recent research also suggests that rainfall decreased between 1980 and 2009 (IPCC, 2012). This report suggests that the Horn of Africa is warmer, drier, and more susceptible to famine.

As Sen (1999) noted, famines do not occur in democracies. The best way of preventing famines is not simply a technical issue of developing better warning systems or aid delivery mechanisms, but instead it requires engaging in the far more difficult task of creating political systems capable of protecting and assisting their people when natural hazards occur (Sen, 1999).

The most recent United Nations High Commissioner for Refugee (UNHCR) reported that 800,000 people fled across borders last year due to conflict in 2011 Global Trends (UNHCR, 2012). When farmers and merchants flee, this also leads to the breakdown of agricultural practices and effects the food availability, production and prices of food. Yemen’s 2011 sectarian conflict has all the similarities of the decade long Somali conflict (i.e. conflicts involving many tribes all fighting for political power). Conflict has been going little over a year in Yemen and has reduced agricultural production, and intensifying socio-political and dwindling financial resources. International humanitarian and relief organizations voiced their concerns
about the food crisis in Yemen, which could unfold into a total catastrophe in the near future (OCHA, 2011).

Ethiopia, Yemen and Somalia were almost equally affected by failure of the 2011 rains. All experienced crop failure, deaths of animals, and human displacement. But as discussed above, famine only occurred in Somalia and Yemen, particularly in areas, where conflict further impeded traditional drought coping mechanisms and reduced access to humanitarian agencies (Office for the Coordination of Humanitarian Affairs [OCHA], 2011). Traditional drought coping mechanisms include splitting of herds, selling and slaughtering of young male animals, collection of feed or hay and assessment of market situations (Kebebew, Dsegaye, & Synnevåg, 2001).

In comparison, the reaction in Ethiopia was better probably due to the result of its stability, but there were also problems with its responses. In Ethiopia there was a concern that the government was underestimating the number of drought-affected people (Oxfam, 2012). In Somalia and Yemen, the response was inadequate or the humanitarian assistance was very slow. This was perhaps because the country’s attention was focused elsewhere, on issues such as Arab uprising, terrorism, corruption, piracy, and clan welfare. Although the response in these three countries was inadequate, the drought did not result in famine in Ethiopia (Oxfam, 2012). The evaluation carried out by the UK’s Disasters Emergencies Committee noted, however, that while mortality did not reach catastrophic levels in Ethiopia, except among refugees. These refugees were mostly Somalis who travelled many miles in search for water and relief from the famine (OCHA, 2011).

The role of the local governments is essential in preventing famine to escalate into serious humanitarian crisis but Somalia’s central government is weak and cannot do much.
Yemen is now experiencing similar situation of going through a food crisis phase due to a weak central government related to the recent Arab uprising.

Humanitarian relief is badly needed to save millions of lives suffering from famine. To solve this crisis, we will need long-term solutions rather than quick fixes to address and patch these problems. The international community needs to provide help to root out the underlying problems and support small farmers and herders who are the backbone of agricultural societies.

The African continent has long faced persistent food shortages, where even a small disruption in harvests can cause huge implication for people. Small-scale food producers need help with hardier crops so that they don’t opt for cash crops and risk management. To alleviate rural Somali poverty, more investment is needed in physical infrastructure, such as roads, wells and adequate warning systems (Oxfam, 2012).

In the end, famine prevention in Somalia rests with the Somali government, its people and regional neighbors. Conflict resolution and building a democratically responsive, transparent institutions and accountable administration are needed so they can address fundamental problems of food production and accessibility (Oxfam, 2012).

United States Department of Health and Human Services Public Health Service completed a report in (DHHS, 1992) that addressed solutions to help improve the agricultural performance at the local and country level so that the country of Ethiopia could independent in meeting its food and emergency needs. The Famine Prevention Framework they propose is based on experiences and needs of Ethiopia, but is relevant to other countries and is a good starting point for countries battling drought every few years. Among its salient points are the following:
• **Building Strategic Information:** expand accessibility to information on weather, food prices, best practices and technology that help individuals, households and communities to investigate new opportunities as well as integrate information systems, which will help early warning monitoring and long-term development planning and policy management (DHHS, 1992).

• **Increasing Resiliency of the Chronically Food Insecure:** focus on protecting lives especially the weak (pregnant women, elderly and children) during famine and provide increase access to essential services such as medicines, sanitation, and education (DHHS, 1992)

• **Expanding Commercial Smallholder Agriculture:** include efforts to put in investment and programs needed to build demand for agricultural goods efficiently and transportation to markets and rural market towns to raise efficiency and productivity of farmers and be ready for economic resources needed for weather crises (DHHS, 1992)

• **Rural Infrastructure Development:** reach and incorporate the rural population by building transportation and health clinics for rural development (DHHS, 1992)

• **Peace and Stability:** create a political space for the private sector and civil society to engage effectively as well as providing an effective and feasible environment for development and emergency assistance (DHHS, 1992)

**Limitations**

The greatest limitation to this situational analysis was finding current reliable data. Data was difficult to obtain and verify due to ongoing civil war in Somalia, which destroyed old data and hindered new data collection. Furthermore, in most situation analysis, the researcher is expected to be present in the study area and directly observe the situation. It was not possible in
this culminating experience to evaluate the reality on the ground; analysis was only possible from secondary data sources.

Conclusions

Public health has increased our life expectancy worldwide by reducing infant and child mortality, and the elimination or reduction of many communicable diseases. Public health is concerned with protecting the health of entire populations.

Somalia has lurched from disaster to disaster in the past 20 years, after collapse of central government. Year after year it is ranked as one of the poorest, most violent countries, plagued by warring militias, bandits, warlords and pirates.

Conflict is the main contributor, but climate change and the breakdown of traditional agricultural practices were likely big factors that influenced Somalia famine last year. Civil war causes farmers, traders and the local people to migrate off their own land and prevents farming and selling of goods. Our ecosystem is connected; lack of rain is connected with destruction of forests and other climatic changes. Lack of terraces prevents collection of water; lack of trees prevents rain sinking in the ground. Although droughts cannot be avoided but measures can be put in place to try to prevent them developing into a famine. Peace, stability and sound infrastructure is the fundamental requirement.
References


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## Appendix A: Tier 1 Public Health Core Competencies Met

<table>
<thead>
<tr>
<th><strong>Domain #1: Analytic/Assessment</strong></th>
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<tbody>
<tr>
<td>Identify the health status of populations and their related determinants of health and illness (e.g., factors contributing to health promotion and disease prevention, the quality, availability and use of health services)</td>
</tr>
<tr>
<td>Describe the characteristics of a population-based health problem (e.g., equity, social determinants, environment)</td>
</tr>
<tr>
<td>Use variables that measure public health conditions</td>
</tr>
<tr>
<td>Use methods and instruments for collecting valid and reliable quantitative and qualitative data</td>
</tr>
<tr>
<td>Identify sources of public health data and information</td>
</tr>
<tr>
<td>Recognize the integrity and comparability of data</td>
</tr>
<tr>
<td>Identify gaps in data sources</td>
</tr>
<tr>
<td>Describe the public health applications of quantitative and qualitative data</td>
</tr>
<tr>
<td>Collect quantitative and qualitative community data (e.g., risks and benefits to the community, health and resource needs)</td>
</tr>
<tr>
<td>Use information technology to collect, store, and retrieve data</td>
</tr>
<tr>
<td>Describe how data are used to address scientific, political, ethical, and social public health issues</td>
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<tr>
<th><strong>Domain #2: Policy Development and Program Planning</strong></th>
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<tr>
<td>Gather information relevant to specific public health policy issues</td>
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<tr>
<td>Describe how policy options can influence public health programs</td>
</tr>
<tr>
<td>Explain the expected outcomes of policy options (e.g., health, fiscal, administrative, legal, ethical, social, political)</td>
</tr>
<tr>
<td>Gather information that will inform policy decisions (e.g., health, fiscal, administrative, legal, ethical, social, political)</td>
</tr>
<tr>
<td>Incorporate policies and procedures into program plans and structures</td>
</tr>
<tr>
<td>Identify mechanisms to monitor and evaluate programs for their effectiveness and quality</td>
</tr>
<tr>
<td>Demonstrate the use of public health informatics practices and procedures (e.g., use of information systems infrastructure to improve health outcomes)</td>
</tr>
<tr>
<td>Apply strategies for continuous quality improvement</td>
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<tr>
<th><strong>Domain #3: Communication</strong></th>
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</thead>
<tbody>
<tr>
<td>Communicate in writing and orally, in person, and through electronic means, with linguistic and cultural proficiency</td>
</tr>
<tr>
<td>Convey public health information using a variety of approaches (e.g., social networks, media, blogs)</td>
</tr>
<tr>
<td>Participate in the development of demographic, statistical, programmatic and scientific presentations</td>
</tr>
<tr>
<td>Apply communication and group dynamic strategies (e.g., principled negotiation, conflict resolution, active listening, risk communication) in interactions with individuals and groups</td>
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<tr>
<th><strong>Domain #4: Cultural Competency</strong></th>
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<tbody>
<tr>
<td>Incorporate strategies for interacting with persons from diverse backgrounds (e.g., cultural, socioeconomic, educational, racial, gender, age, ethnic, sexual orientation, professional, religious affiliation, mental and physical capabilities)</td>
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<tr>
<th><strong>Domain #5: Community Dimensions of Practice</strong></th>
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</thead>
<tbody>
<tr>
<td>Recognize community linkages and relationships among multiple factors (or determinants) affecting health (e.g., The Socio-Ecological Model)</td>
</tr>
<tr>
<td>Identify stakeholders</td>
</tr>
<tr>
<td>Describe the role of governmental and non-governmental organizations in the delivery of community health services</td>
</tr>
<tr>
<td>Identify community assets and resources</td>
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<table>
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<tr>
<th><strong>Domain #6: Public Health Sciences</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the scientific evidence related to a public health issue, concern, or intervention</td>
</tr>
<tr>
<td>Retrieve scientific evidence from a variety of text and electronic sources</td>
</tr>
<tr>
<td>Discuss the limitations of research findings (e.g., limitations of data sources, importance of observations and interrelationships)</td>
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<thead>
<tr>
<th><strong>Domain #7: Financial Planning and Management – N/A</strong></th>
</tr>
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</table>

| **Domain #8: Leadership and Systems Thinking – N/A** |