

Climate Change, Drought, and Famine in Kenya.

A Socio-Ecological Analysis

by Steven Engler, Joan Okitoi and Bernd Sommer



Abstract

The development and impacts of famines are predominantly explained by theories focusing on the social aspects of food distribution, and not on its availability. However, during the last 30 years, the frequency of droughts in Kenya and other countries in the Horn of Africa has increased. In public debates, this development is linked to global climate change, which is claimed to have led to a reduction of rainfall in recent years. In order to investigate Kenya's hunger crises in 2009 and 2011, this paper draws on the Famine Vulnerability Analysis Model (FVAM), which focuses on socio-ecological systems as the basis for famine analysis. Thus, climatic drivers are examined as possible causes of famines, too. Our analysis found that due to a relatively high social and environmental vulnerability in Kenya, even minor shifts in climatic conditions can show major effects on food security. At least since 1960 the temperatures in most parts of Kenya rose, and simultaneously, precipitation showed decreasing trends. Additionally, rainfall has shown a widening of the standard deviation in recent years. The consequences are food scarcities on a general basis and famines that return much more frequently in recent years.

Keywords

Kenya, Vulnerability, Famine, Drought, Climate Change, Socio-Ecological Systems

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Introduction

Around forty years after the first globally recognised famines in the Sahel, food scarcity and deprivation are still a defining element of Sub-Saharan Africa. Between 1900 and 2012, 288 droughts were recorded in the continent of Africa, which caused around 844,000 deaths and affected over 335 million people in total (EM-DAT 2012). In recent years, food shortages and famines in Western Africa (e.g. Mali), or in South-eastern Africa or at the Horn of Africa (e.g. Somalia, Ethiopia) and in Kenya became more frequent. According to the Global Hunger Index (GHI) 2014, people in East Africa have a very high GHI score and were estimated to be at risk of starvation (Grebmer et al. 2014). In 2011, at least 12.4 million people were malnourished in the Horn of Africa – Kenya in particular was affected by the crisis (Feed the Future 2011b). 2009 was also a famine year, when an extreme food shortage affected around 9.8 million people in Kenya alone (European Commission Humanitarian Aid 2009). Further, the recent outcomes of the “Famine Early Warning System Network” (FEWS Net 2015) illustrate the vulnerability of East Africa to famines.

Wolde-Mariam (1984) defined famine as a “general hunger affecting large numbers of people in rural areas as a consequence of the non-availability of food for a relatively long time”. However, this definition excludes famines in the urban framework and a social differentiation in times of food scarcities. More recently, Ó Gráda (2009) stressed the fact that “famine refers to a shortage of food or purchasing power that leads directly to excess mortality from starvation or hun-

ger-induced diseases”. While Ó Gráda’s is directly linking a famine to excess mortality, de Waal (1989) showed that in certain cases the main threat is to perceive an upheaval of the traditional way of life instead of fearing a possible death. Therefore, in this paper, famine is defined

“as an extreme scarcity of food or a drop in exchange entitlements in a certain region over a multi-year period that threatens the way of life of the already-vulnerable resident population and frequently leads to a higher mortality rate”
(Engler 2012a).

Since the mid 1980s, development and impacts of famines have predominantly been explained by Amartya Sen’s “Food Entitlement Decline” (FED) theory. It focuses on the social circumstances of food distribution, and not exclusively on its availability. Sen emphasises that during a famine only certain parts of society are affected by hunger, while others have plenty (Sen 1981; Sen 1984). Although Sen’s focus on distribution is crucial for the understanding of hunger crisis, natural factors for the availability of food, such as climatic aspects or weather extremes, are excluded on a general basis. However, the increased frequency of droughts in Kenya and other countries in the Horn of Africa during the last years is attributed to anthropogenic global warming in public as well as political debates (Green 2011). For instance, Rajiv Shah, the administrator of the US Agency for International Development (USAID) declared: “There’s no question that hotter and drier growing conditions in sub-Saharan Africa have reduced the resilience of these

communities. [...] Absolutely the change in climate has contributed to this problem, without question" (Hersh 2011).

In order to investigate Kenya's hunger crises in 2009 and 2011, we draw on the Famine Vulnerability Analysis Model (FVAM; Engler 2012a and Engler et al. 2013), which focuses on socio-ecological systems (Redman et al. 2004) as the basis for famine analysis. Thus, we also consider weather extremes and climate as possible causes of famines.

2. The Famine Vulnerability Analysis Model (FVAM)

The FVAM is a heuristic tool for the description of famine conditions. Existing vulnerability concepts by Birkmann (2006), Bohle (2001), Füssel (2007), Pahl (2006) and Turner II et al. (2003) are the underlying basis of the FVAM, to which new dimensions are added. For instance, the evaluation of the pre-famine phase is one of its major

innovations. Accordingly, the FVAM is divided into four phases: (1) the pre-famine vulnerability, (2) the initiating drivers, (3) coping capacity and direct impacts, and (4) an adaptation phase. Phase one studies people's livelihood, before the initial drivers started affecting them (Engler 2012a). On the contrary, the focus of most other models is fully on the impacts of a famine and the subsequent coping and adaptation strategies (Engler 2012b). The analysis of the pre-famine vulnerability is based on specific indicators (Table 1), which are generated from famine and vulnerability literature. The second phase of the FVAM is characterised by the initiating drivers such as climatic events (for instance, extreme weather), failures of political crisis management, riots, wars and environmental circumstances (such as microbial shocks). In most famines, a combination of those drivers leads to the point when the chronic symptoms of food scarcity become an acute famine. Cop-

ing capacity and direct impacts on an affected group or society are major subjects of the third phase. The adaptations to famine crises build the fourth phase (Engler 2012b). The connections (e.g. migration processes) and feedback-loops among the phases (e.g. between coping capacity and direct impacts) make the FVAM an appropriate tool for famine analysis (Fig. 1).

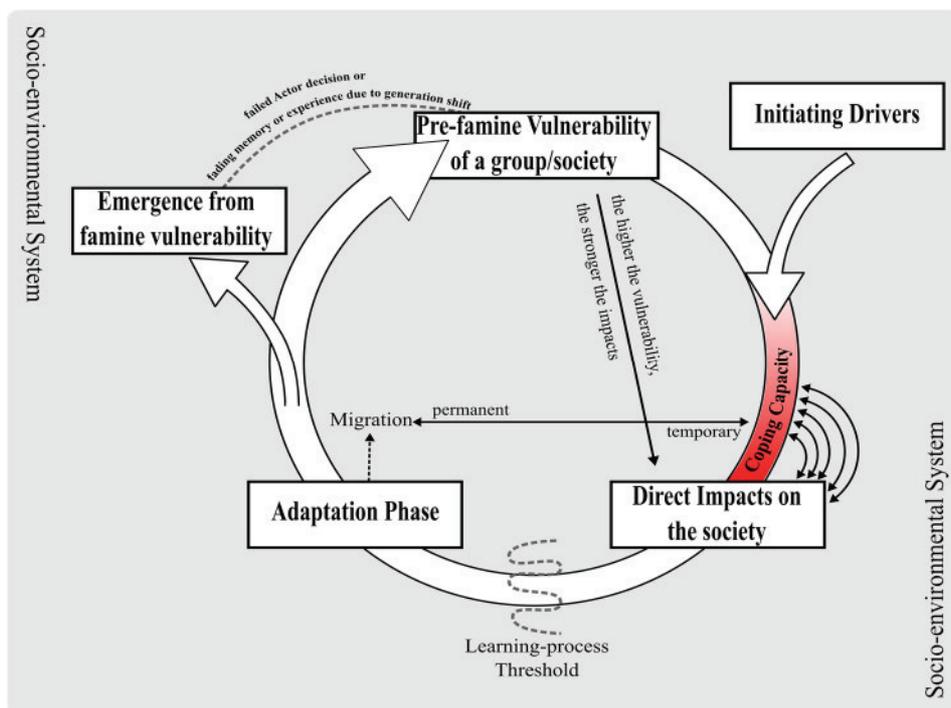


Fig. 1 Famine Vulnerability Analysis Model (FVAM) (Engler 2012a)

For our analysis of Kenya’s hunger crises in the years 2009 and 2011, we focus on the first two phases of the FVAM: pre-famine vulnerability and initiating drivers. The phase “coping capacity and direct impacts on the society” is only scrutinised, as far it is crucial for understanding Kenya’s hunger situation; the adaptation phase is excluded from our analysis. Originally, the FVAM was developed to study historical famines (cf. Engler 2012a; Engler et al. 2013). Nonetheless, it also allows the analysis of recent and ongoing famines. To achieve this aim, we suggest a modification of certain parts of its phasing structure (Engler 2012a). In contrast to the previous usage of the FVAM, we also adapt, combine and remove specific indicators. In Table 1, the modified indicators for analysing famine vulnerability in contemporary societies are summarised. In the course of our analysis, we describe the various indicators for Kenya on a qualitative basis.

Table 1: Famine Vulnerability Indicators

Social Vulnerability (SV)	<i>Population</i>
	Population Size
	Marginalisation or inequality
	Urbanisation
	Exchange Entitlements
	Dependence structure
	<i>Governance</i>
	Political system
	Relief systems
	Education systems
	Power struggles (internal or external)
	Health system
	Legal structure

Social Vulnerability (SV)	<i>Economy</i>
	Financial structure
	Tax-structure
	Economic opportunity
	Market integration
	Labour market situation
	Infrastructure
	Grain prices or prices of staple foods
	<i>Agriculture</i>
	Agricultural diversification
Agricultural techniques	
Famine history and memory	
Fresh water accessibility	
Environmental Vulnerability (EV)	<i>Environment/Climate</i>
	Geographical position
	Population´s perception of climate
	Temperature conditions
	Precipitation conditions
	Mean temperature during the growth period of staple crops
	Mean precipitation during the growth period of staple crops
	Influence of other forcings
	Fresh water availability

Although derived from famine and vulnerability literature, this is just a selection of possible factors that influence famine vulnerability. For any individual case, it could be argued that a specific factor, which cannot be found in this particular list, is important, too. In order to analyse famine vulnerability in the following section, the 30 indicators (Table 1) will be applied to the situation of Kenya’s food crises between 2008 and 2011 by drawing on academic and grey literature as well as official statistics (mainly of local authori-

ties and the United Nations Development Programme) and a climate analysis.

3. Famine vulnerability in Kenya

3.1 Social Vulnerability (SV)

Population

For more than 30 years, a growing population is regarded as one of the reasons for Africa's ongoing food crisis (Eicher 1982; Dorélien 2008). If an increasing number of people needs to be nourished, agricultural productivity and/or food imports need to be increased in order to avoid scarcity. The population of Kenya has tripled since Kenya's independence in 1963 and has exceeded 40 million people (UNDP 2011). The population of Kenya is currently growing at 2.5 percent annually (ibid.). Poverty is endemic in Kenya: 19.7 percent of the population earn less than USD 1.25 a day, and additionally, 27.4 percent of the population is regarded as "vulnerable to poverty" (UNDP 2011). According to the Kenyan Government, over 10 million people suffer from food insecurity and at any one time, about 2 million people are in need of assistance to access food (GoK 2011). The pastoralist communities in the arid and semi-arid lands live in 18 out of the 20 poorest constituencies in Kenya. In the northern districts of T sukana, Marsabit, Wajir and Mandera between 74 and 97 percent of the people live below the absolute poverty line (Fitzgibbon 2012). Kenya is a rapidly urbanising; currently between a third and a half of Kenya's population live in urban areas. Urban poverty can be particularly debilitating because the urban poor are dependent upon the cash economy to obtain food, water,

and shelter, rendering them more vulnerable (Gallaher et al. 2013). Income and gender inequalities are also extremely high in Kenya (UNDP 2011). Non-governmental organisations claim that due to Kenya's land ownership system, young men often only gain access to land upon the deaths of their fathers, while women mostly have no prospect of owning land at all (FIAN/RAPDA 2010). Additionally, Kenya's dependency ratio – the proportion of the population that does not belong to the labour force in relation to the labour force – is comparatively high (82.1 percent) (UNDP 2011).

Governance

After gaining independence from the United Kingdom in 1963, Kenya became a presidential republic, which under the new constitution of 2010 comprises 47 semi-autonomous counties. Previously, Kenya was divided into eight provinces that were headed by a provincial commissioner (appointed by the president). "Article 43 (c) of the Constitution of Kenya provides that everyone has the right to be free from hunger and to have adequate food of acceptable quality" (Omiti and Laibuni 2012). However, the national legislation relating to food production is fragmentary and at times contradictory. Several ministries have the mandate to work with agriculture and related issues, which leads to confusion regarding responsibility for implementation (FIAN/RAPDA 2010). Furthermore, corruption and nepotism negatively affect almost all policy fields, for example, agricultural and infrastructure programmes. The national disaster management architecture in Kenya is fragmented and there is no single authority responsible for disaster management (TI

2012). So far, “emergency interventions have been implemented in rather haphazard and knee-jerk approach with minimal strategic policy focus” (Irungu et al. 2009).

Kenya spends 4.3 percent of its Gross Domestic Product (GDP) on education, which is relatively low compared to international standards (UNDP 2011). However, since 2003, primary education in Kenya is free, and 87 percent of the adult population are literate (ibid.). Nevertheless, the semi-arid and arid lands continue to lag behind as exhibited by the 36 percent primary school enrolment compared to the national average of 93 percent (Fitzgibbon 2012). Research done on the education level of pastoralists showed that increased household education improves pastoral land management and thus is a critical component in lowering vulnerability towards natural disasters (ibid.).

After the contested elections in 2007, in clashes between the supporters of the competing parties (often divided along ethnic affiliations and geographic location) over 1,000 people were killed, and between 350,000 and 600,000 people were displaced (Elhawary 2008; Jenkins 2012). It is reported that during these violent conflicts, which partly coincided with the harvesting season, crops were destroyed or left to perish in the fields (FIAN/RAPDA 2010). In addition, many of displaced persons were peasant farmers who were unable to tend to their crops or plant again the following season (ibid.).

Total expenditure on health in Kenya is 4.3 percent of the GDP (UNDP 2011). HIV/AIDS is one of Kenya’s most severe health problems: In 2009, about 1.5 million people were estimated to live with HIV/AIDS and about 90,000 people died of AIDS related diseases (CIA

2012). The risk of getting other major infectious diseases is regarded as high (ibid.). Poor health and heavy expenses related to health care are regarded as the most important reasons for driving people into poverty in Kenya (Kristjanson et al. 2010).

Recently, land has been encroached upon by agricultural and urban expansion as well as by the increased acquisition of land by foreign investors. For instance, the discovery of oil in the county of Turkana has generated immense interest in this food insecure region and raised questions of rights to land and water. The Turkana community traditionally views the county of Turkana as their ancestral land meaning that no individual land rights exist. In general, land in Kenya remains contentious and almost all settlement schemes from colonial to modern times have been complicated by controversy and corruption, frequently resulting in violence. Contested land issues also affect the availability of grazing land for livestock. Increased livestock raiding additionally contributed to famine vulnerability in Turkana in recent years (Hendrickson et al. 1998).

Economy

The indicator group of economy of the FVAM includes market integration, labour markets and financial related topics. Kenya’s national budget shows a structural deficit. In 2011, public debt amounted to 50.7 percent of the GDP (CIA 2012). Taxes and other revenues count for 19.7 percent of the GDP, which compared to international standards, is relatively low (CIA 2012). The government’s capacities to respond to natural disasters are therefore financially highly limited.

In 2011, Kenya had a GDP per capita of USD

1,573 and was ranked 143 (out of 187) on the Human Development Index (HDI; UNDP 2011). More than 75 percent of the workforce is employed in the agricultural sector, which exports mainly tea, flowers, coffee and horticultural products. The service industry (especially tourism and telecommunications) showed continual growth since the 1980s and now accounts for 61 percent of the GDP (CIA 2012). Cross-border trade in Sub-Saharan Africa is still weak. Therefore, localised production shortfalls can hardly be compensated by imports from regions in a surplus situation (Grebmer et al. 2013). In 2011, an estimated 40 percent of the Kenyan labour force of about 18 million were unemployed (CIA 2012), which also leaves them in a vulnerable situation. A weak *infrastructure* hinders farmers to access markets and market-information as well as information about new technological developments (FIAN/RAPDA 2010). The global rise in food prices in 2008 and 2011 (FAO 2012) as well as the related increase in costs of agricultural inputs such as seeds, fertiliser and fuel also led to a noticeable increase of food costs in Kenya in recent years. In short, Kenya's macroeconomic situation as outlined here additionally increases famine vulnerability.

Agriculture

Smallholder and/or subsistence farmers, who mainly grow maize, wheat, rice, pulses and potatoes, primarily dominate agriculture in Kenya. However, in certain regions (e.g. in the area Mumias) sugar, tea and coffee companies are evoking monoculture production for export. Additionally, Kenya's agricultural patterns are defined by the altitude and the amount of rainfall received: while mainly the

highlands show a medium to high agricultural potential, most of the country consist of arid and semi arid lands (Irungu et al. 2009). Like many other African societies, Kenya has a long tradition of dealing with food shortages and minimizing the effects of drought and famine (Osterhammel 2009). Certain ethnic groups, for example, the Maasai or the Turkana have developed diverse traditional coping strategies (such as mobility and livestock diversity) in order to adapt their way of life to their harsh environment and circular drought (Blackwell 2010). However, these traditional coping strategies, which are based on previous experiences, rely on a relative stable climate.

About 50 percent of the rural population in Kenya has no access to clean water (World Bank 2013). Livestock agriculture, which is mainly practised by communities in the arid and semi-arid lands, is heavily dependent on precipitation. Less rainfall leads to clustering of livestock in limited dry-season grazing areas and to degeneration of livestock productivity. "In a culture in which livestock constitutes a capital investment for the individual Maasai as well as the main source of food, loss of livestock means a loss of food as well as potential cash with which food could have been purchased" (FIAN/RAPDA 2010).

3.2 Environmental Vulnerability (EV)

Analysing climatic aspects in Eastern Africa is extremely difficult because of deficient data in various regions (IPCC 2012). The temperature development in specific cities in Eastern Africa over the past 100 years (1904-2011) shows an increasing trend (Fig. 2). In

all of these eight cities, characterised by different altitudes, geographical reliefs, recorded data timeframe, etc., of four Eastern African states (Djibouti, Ethiopia, Kenya and South Sudan) the temperature rose.

Kenya is no exception to this East African temperature trend. Between 1960 and 2010, the temperatures rose on a general basis (GoK 2010). Even at the coastal stripes, where the temperatures at night and in the early morning decreased slightly, the daytime temperatures were significantly higher (Table 2).

The Berkeley Earth Surface Temperature (BEST) dataset shows that this trend even goes farther back in time with a temperature increase of 1 degree Celsius from 1850-2013 (Fig. 3).

The Horn of Africa is a precipitation-poor region with average amounts of 500mm of rain

Table 2: Temperature trend from 1960-2010 (Data: GoK 2010)

Region	Night and early morning temperature in °C (minimum)	Daytime temperatures in °C (maximum)
Western	0.8-2.9	0.5-2.1
Northern and North-Eastern	0.7-1.8	0.1-1.3
Central	0.8-2	0.1-0.7
South-Eastern districts	0.7-1	0.2-0.6
Coastal strip	-0.3-(-1)	0.2-2

annually or less (Nicholson 2001). Between 1960 and 2010, the average amount of precipitation in Kenya remains relatively stable, but due to the decline in the main rainfall season between March and May the annual trend shows a slight decrease in precipitation rates (GoK 2010). The "Global Precipita-

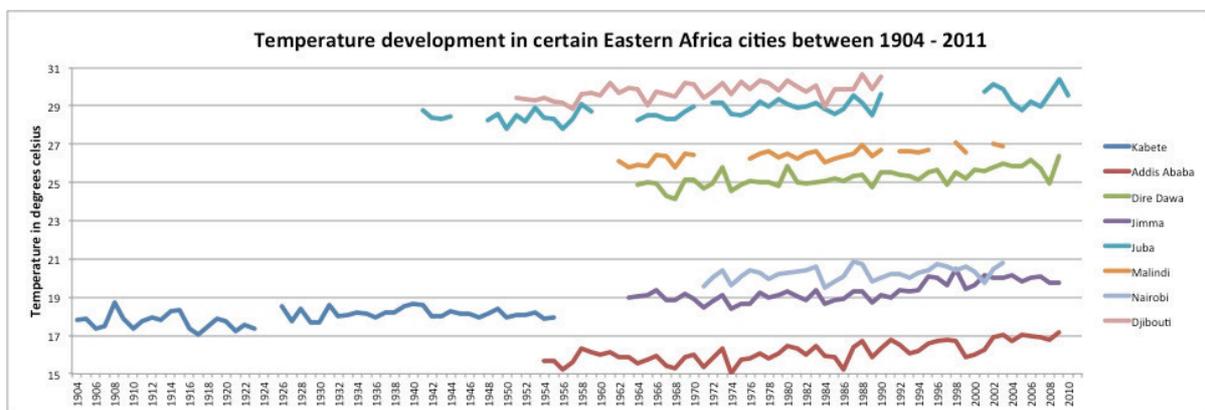


Fig. 2 Temperature development in certain Eastern African cities between 1904-2011 (NASA 2012)

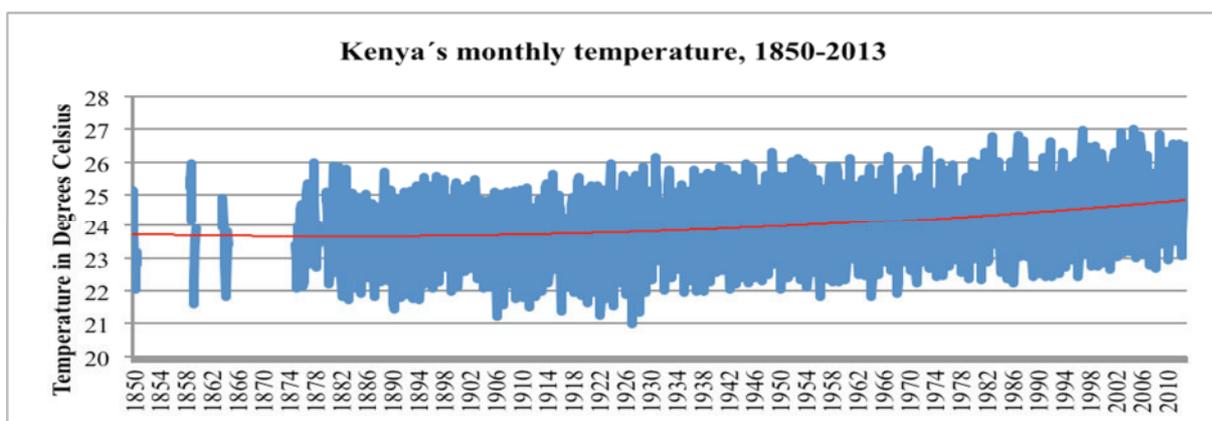


Fig. 3 Kenya's monthly temperature, 1850-2013 (Data: Best 2013; Rohde et al. 2013)

tion Climatology Centre” (Schneider et al. 2011) dataset underlines this statement (Fig. 4).

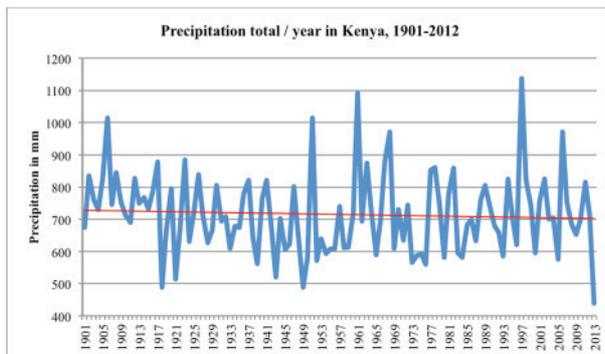


Fig. 4 Precipitation total/year in Kenya, 1901-2012
(Schneider et al. 2011)

In interviews with non-governmental organisations, farmers stated that there used to be two rain seasons per year and that one could predict the onset of the rains (FIFAN/RAPDA 2010). Nowadays, however, for the farmers predictability was no longer viable (ibid.)

Not only climatic developments are influencing environmental famine vulnerability. Although the Kenyan highlands belong to the most productive agricultural regions in Africa, large parts of the land show a comparatively poor quality, and only an estimated 20 percent of the land is classified as high to medium potential (ibid.). Often, both factors pile up. For instance, the Machakos district (Southeast of Nairobi), which has mainly arid and semi-arid land, was also one of the areas worst hit by drought in recent years (ibid.). Between 2003-2010, 8.9 percent of Kenya’s renewable fresh water resources were withdrawn (UNDP 2011).

4. Initiating Drivers

As mentioned in section two, for most famines there are several initiating drivers. Typically, only a combination of different drivers

leads to a famine. In this chapter, we focus on temperature and precipitation as crucial drivers for the analysis of the recent Kenyan famines. However, we recognise that other factors, in particular economic and educational aspects, also show a big effect on the development of local food scarcity. For instance, heightened food prices have played a crucial role in the Kenyan famines of 2009 (Kenya Food Security Network 2009a) and 2011 (Kenya Food Security Network 2011a). Yet, food prices are often correlated to extreme climate events and its impacts. Furthermore, the displacement of a large number of corn farmers in Kenya’s agricultural areas that has followed the post election violence contributed to the hunger crisis in 2009. FAS/Nairobi estimates that Kenya’s corn production for 2008/09 was at 2.1 million metric tons (MMT) down from about 3 MMT (FAS 2009). Finally, it is reported that early warning was insufficient in the forerun of Kenya’s last severe famines (Zwaagstra et al., 2010) or was not linked to resource mobilization in order to facilitate rapid responses (Osano 2012).

Due to a comparatively high social and environmental vulnerability in Kenya (see chapter 3), even minor shifts of the weather conditions can show major effects on food security.² As it was mentioned in section three (e.g. Fig. 4) the amount of precipitation in Kenya decreased slightly over the years. In

2) The “World Summit of Food Security” (WSFS) describes “food security” as follows: “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability. The nutritional dimension is integral to the concept of food security” (WSFS 2009).

several districts of Kenya, rainfall is a limiting factor to food production (Wakwabubi 2006). Lately, precipitation rates reached new minimum values in Central Kenya (USGS 2010), which leads to further droughts. These precipitation trends lead to shrinking agricultural productivity (USGS 2010). Kenya's official authorities also recognise the connection between droughts and famines: "Due to droughts, the country's famine cycles have reduced from 20 years (1964- 1984), to 12 years (1984-1996), to two years (2004-2006) and to yearly (2007/2008/2009)" (GoK 2010).

Both, the drought of 2009 as well as the drought of 2011, were triggered by succeeding seasons with very low rainfall and rising temperatures as temperature measurements in North and Northeast of Kenya exemplify (Fig. 5). The temperatures rose in both years between April and July, with a peak anomaly of 1.2 degrees Celsius in April 2011. Similar temperature trends, with different amplitudes, are observable in the other regions (Central Kenya, South and South-

east Kenya, and West Kenya).

In January 2009, the Kenya Food Security Network (a network of governmental and non-governmental organisations that is continuously monitoring Kenya's food security) noted:

"Poor rains in the south eastern and coastal marginal agricultural lowlands, in combination with an early end to the short rains season, and after a succession of three poor seasons, have resulted in widespread crop failure, and precipitated a likely humanitarian and livelihood crisis. [...] Pastoral areas in the north and south received poor short rains and require immediate assistance" (Kenya Food Security Network 2009b).

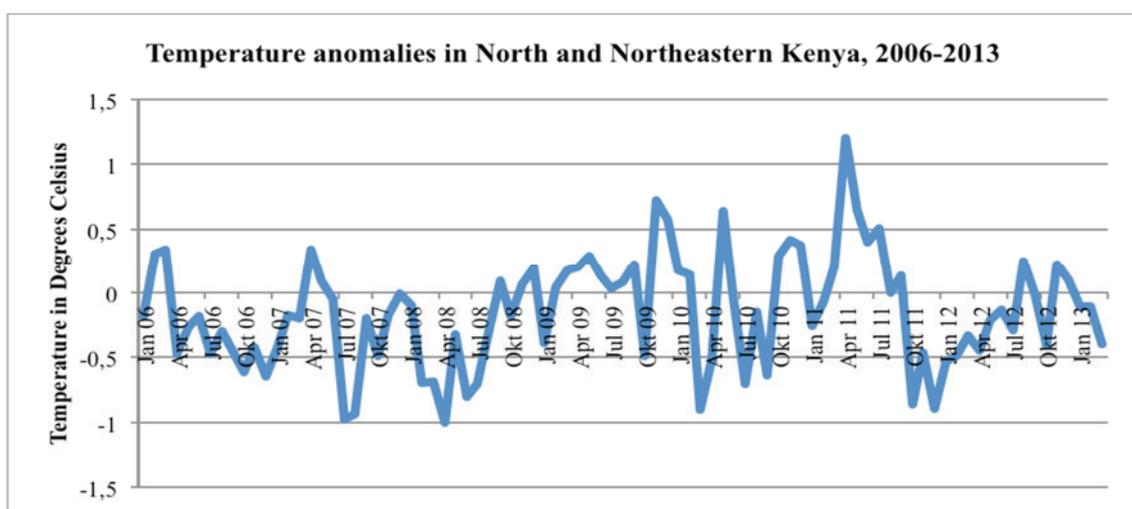


Fig. 5 Temperature anomalies in North and Northeastern Kenya, 2006-2013 [Data: Best 2013; Rohde et al. 2013]

3) In comparison to the 1961-1990 reference period.

4) The Kenya Food Security Network comprises the Ministry of Agriculture and the Arid Lands Resource Management Projects (ALRMP) from Kenya, the Famine Early Warning Systems Network (FEWS Net), the United States Agency for International Development (USAID), and the United Nations World Food Programme (WFP).

According to the food security network, the deficit of short rains at the end of 2008 in the southeast, coastal lowlands, and northern pastoral districts, gave rise to a food security crisis in those areas. The rains were delayed by more than three weeks and lasted for unusually short periods of time (Fig. 6). The short-rains seasons are of special importance for agriculture in these regions, because they often compensate for a previous lack of precipitation (ibid.). The reduced rainfalls also indirectly affected food security negatively. For instance, as a result of poor

the network also mentioned the effects of heightened food prices, livestock disease, and debilitating conflict, drought was still evaluated as “the critical proximate causal factor” for the precarious decline in food security in 2009 (Kenya Food Security Network 2009a).

In 2011, food security was most precarious among pastoralists residing predominantly in North and North-Eastern areas as well as among small farmers in the short rains-dependent southeast and coastal marginal agricultural areas (Kenya Food Security Net-

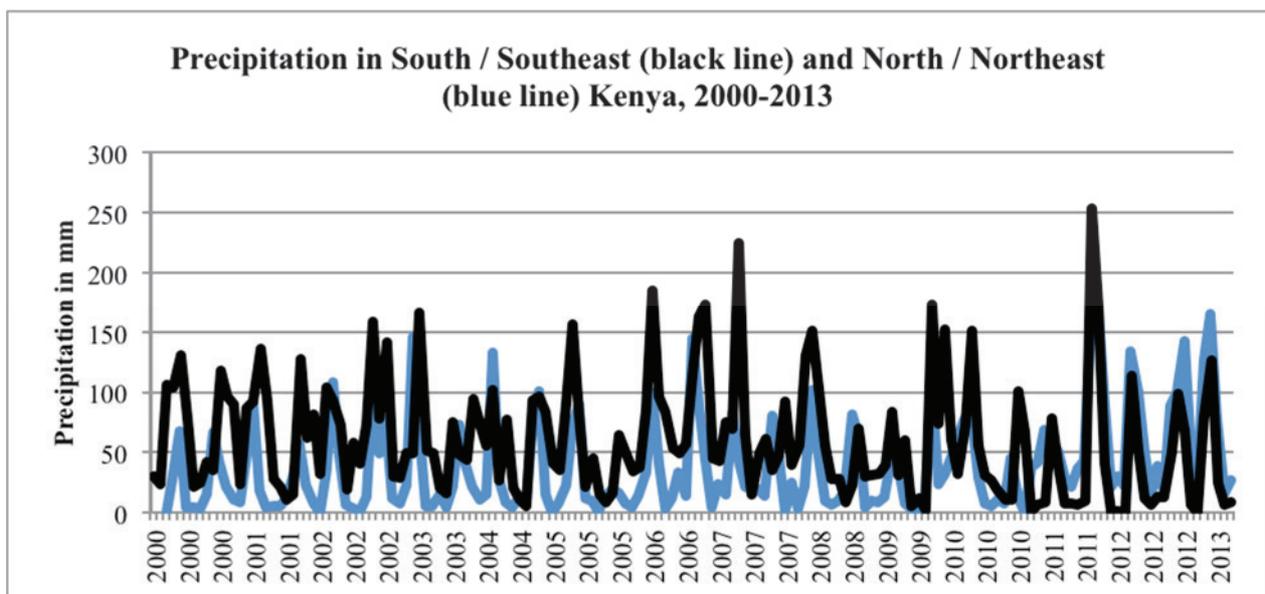


Fig. 6 Precipitation in South /Southeast (black line) and North / Northeast (blue line) Kenya, 2000-2013 (Data:

rains, freshwater in regions such as larger Makueni, Kiuti, Tharaka, and the lowlands of the central province became scarce, leading to increased prices. In combination with rising food prices, especially poor households became less resilient, in order to compensate the failure of their harvest by monetary means.

Unfortunately, the food security network’s fears at the beginning of the year became real during the following months. Though, in its “Food Security Update” from August 2009

work 2011a). The Kenya Food Security Networks (2011b) again identified drought, respectively, the poor performance of the short rains at the end of 2010, as a decisive driving factor of the decline in food security in these areas. The months from October until December 2010 had again witnessed depressed rainfall (Fig. 6). Prior to the food crisis, the United Nations had indicated that since 1965, the year 2011 recorded the lowest rainfall rates (Wanjawa 2011). In some parts of the country, such as Turkana in

Northwest as well as Marakwet, Mogotio, Nakuru in the West and Southwest and Mandi in the Southeast heavy rains and flooding's in the mid of 2010 already stressed the soils before the drought (USAID and FEWS NET 2010a; USAID and FEWS NET 2010b).

5. Coping capacity and impacts on society

It is estimated that during the 2011 famine 3.75 million Kenyans and 500,000 refugees from Somalia and the larger Eastern African region required food aid while over 300,000 children were affected by malnutrition (Osano 2012). According to the European Commission Humanitarian Aid (2009), in 2009 extreme food shortage affected around 9.8 million people in Kenya. The effects of the 2009 and 2011 famines in Kenya left mainly pastoralists and agro-pastoralists in serious need of food relief (Musingi 2013). The impact on livelihoods was mostly felt in the semi-arid and dry land areas, which make up most of the northern and north-eastern part of Kenya. During the 2009 famine, the main districts where relief operations took place include Marsabit, Turkana, Samburu, Isiolo, Laikipia and Kajiado (Zwaagstra et. al 2010). These interventions varied from one district to another but comprised water trucking, destocking-slaughter, animal health, animal feed and peace-building (ibid.). To cope with this situation, Kenya imported 2.6 million bags of maize in the years 2008 and 2009 (GoK 2010). However, the amount was repeatedly described as insufficient by beneficiaries (FIAN/RAPDA 2010). Additionally, it is claimed that the distribution of relief food was hampered by nepotism,

theft and a lack of transparency (ibid.). During the 2011 famine, former President Mwai Kibaki declared the drought a national disaster but was criticised for being too slow in responding to the humanitarian crisis. Three months after the beginning of the drought, the Ministry of Special Programmes handling food relief supplies and emergency disaster relief, allocated USD 22 million for food provision, sanitation and hygiene in refugee camps, water trucking, emergency school feeding programmes and livestock take-off programmes (ibid.). In addition, cash transfers were also given to over 60,000 people living in famine affected areas. Responses to the crisis included food distributions by the United Nations World Food Programme (WFP) to an estimated 1.7 million people monthly (Kenya Food Security Network 2011). Here too, due to inadequate targeting, impacts were evaluated as limited (ibid.). For instance, in September 2011, a district Commissioner was arrested and charged with stealing maize worth USD 13,000 (Harmer and Seris 2012).

6. Conclusion

This paper sought to enrich the debate on Kenya's famine causes by applying the FVAM on Kenya's hunger crises of 2009 and 2011. Focusing on socio-ecological systems for famine analysis means to add environmental and climatic perspectives to the familiar pauperization context. Our famine vulnerability analysis – based on social vulnerability indicators as well as environmentally related indicators – found Kenya highly vulnerable for famines in between 2008 and 2011. Some of these vulnerabilities are linked to the colonial past (for instance, violent conflicts with

an ethnic connotation or land ownership patterns as well as the structure of agricultural production), and some are rather new developments. At least since 1960, the temperatures in most parts of Kenya rose, and simultaneously, precipitation showed decreasing trends. Additionally, rainfall has shown a widening of the standard deviation in recent years. This has led to reoccurring droughts, which drives the already highly vulnerable population in some parts of Kenya into famines. Kenya's nomadic and semi-nomadic pastoralists, who live in arid and semi-arid regions (e.g. Turkana) with only a weak infrastructure and whose livelihood is entirely dependent upon grazing land, are already vulnerable to the slightest increase in temperature and reduction of rainfall, are particularly affected. Also farm households, for example, in Kitui, have suffered from near-total crop failure during the last droughts. While droughts are climate/weather extreme related, famines are mainly man-made. A significant portion of the population permanently lacks food security and suffered or even died because they were vulnerable to changes in weather/climate and the famine was a mere trigger and not the cause of their misery. A society with a less severe financial and economic situation as well as an increased governance capacity and a famine relief system would have been more resilient to famine than Kenya was in 2009 and 2011. The recurrence of disasters in Kenya pinpoint that local communities as well as the national government are still inadequately prepared for disaster prevention, control and mitigation (Mutugi and Maingi 2011). Due to this comparatively high vulnerability, even minor shifts in weather conditions can show

major effects. The consequences are food scarcities on a general basis and famines that return much more frequently in recent years. In the third quarter of 2015, some regions in Central, Northern, Eastern and South-Eastern Kenya were again classified as "stressed" or "crisis" by the "IPC Acute Food Insecurity Phase" (FEWS NET 2015).

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Editorial

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