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An Overview of Food and Nutrition Security Situation of Kenya

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ABSTRACT

Achieving food and nutrition security remains a challenge for Kenya, despite International bodies providing long-term active support-in order to achieve it. Low technological capability, inefficient production systems, inconsistent economic growth, increasing population and lately climate variability, affect food production, leading to either stagnation or only modest gains in food and nutrition security in Kenya. Nevertheless, food and nutrition security continues to improve, albeit at a slow pace. The major drivers of the improvements are political stability, ambitious economic planning, the quest for higher agricultural productivity, improving educational achievement, sanitation and health. To accelerate the process, Kenya embraced Vision 2030, devolution of governance and resources to County Governments, and lately, the Big 4 Agenda. This overview examines the status of food and nutrition security in Kenya including the prospects and the challenges faced. The analysis provides specific recommendations for achieving it. These include investment in agriculture, decelerating population growth, using adaptive research to solve farmer-problems, improving the management of farmer-organizations and formation of cooperatives.

Keywords: Agriculture, Food and Nutrition Security, Kenya

INTRODUCTION

1.1 Food and Nutrition Security

Food Security is often considered to include the following dimensions: access, availability, adequacy, safety, affordability and stability. Even though food is recognized as a universal human right due to its central role in human development, it continues being a challenge for millions of people in the world, and especially for many citizens of developing countries, including Kenya. Many other countries of Africa are also victims of the situation, as most of the world's poorest and food-insecure countries are found in the Continent (World Bank, 2019b).

Following on the lead by the FAO, it is opined that the link of food sufficiency and nutrition status of the consumer should be clearly brought out whenever the subject of food security is discussed (FAO, 2009). This is so because when we consume food, the food is supposed to supply the right nutrients in the proportions and form that the body needs for optimal metabolic and physiological functioning. Thus the improved definition that brings out both aspects (food security and nutrition security) becomes: “Food and Nutrition Security exists when all people, at all times, have physical, social and economic access to food that is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life” (FAO, 2009). It then follows that in any discussion on food and nutrition security, as much as we should consider physical access, availability, affordability, adequacy, and stability of the food supply, the quality of the food supply is critical. Quality encompasses not only physical fitness for purpose of the food item, but its safety and acceptability to the consumer (Lokuruka, 2002). The food consumed must also meet the quality and quantity requirements of age, gender, occupation and health status of the consumer (Institute of Medicine, IOM, 2005). Appropriate nutritional quality of the food supply is an essential prerequisite for maintaining good health status of individuals (IOM, 2005). The critical role adequate and appropriate nutrition plays in health and human development, therefore, warrants greater commitment to the attainment of good nutritional status. In order to attain food and nutrition security for all its citizens, Kenya continues working towards ending hunger and malnutrition among its citizens. Similar to other countries, it recently adopted the Sustainable Development Goals as part of its development agenda in an effort to end hunger and poverty. The current article examines the status and prospects for food and nutrition security in Kenya and also gives some recommendations, which if adopted, are likely to improve food and nutrition security in the country in the future.

1.2 Geography, weather and climate

1.2.1 Geography

Kenya is situated in a part of the African continent where one finds mainly plateaus and plains, some of the highest elevations and the largest lakes on the African continent. It borders South Sudan to the northwest, Uganda to the west, the Jubaland Province of Somalia to the east, Tanzania to the south, and Ethiopia to the north. The geography of Kenya is diverse, varying amongst Kenya's 47 Counties. The country has a coastline on the Indian Ocean, which contains swamps of East African mangroves. Inland we find broad plains and numerous hills.

The Kakamega Forest in western Kenya is a relic of an East African rainforest. The Mau Complex mainly in Narok County, and whose influence affects the region, is the largest forest ecosystem in East Africa and a major water tower for Kenya.

In the interior of the country, the highest elevations in the highlands reach as high as 2,000-3,000 feet above the mean sea level. The twin Rift Valley systems run across the country. The Great or Eastern Rift Valley runs from the Red Sea down through Ethiopia and Kenya going downwards towards Tanzania and further down as far as Mozambique. The faulting activity created Lake Turkana in northern Kenya and Tanganyika in neighbouring Tanzania. The Western Rift system curves around western Uganda and Tanzania and includes Lake Victoria, the largest tropical lake and the largest and second largest fresh water lake in Africa and the World by surface area, respectively. However, only about 6% of the lake is in Kenya, though the productivity of Kenya's portion is higher than that of the portions in Uganda and Tanzania, a matter that often

creates problems for Kenyan fishermen and has led to an ongoing border dispute with Uganda around Mizingo Island. The snow-capped (though the ice cap is thinning due to climate change and a possible rise in temperature of the air and environment around it) Mt. Kenya stands at over, 17,051 feet (5,197 M) above sea level in the central part of the country. On the western part of the country stands Mount Elgon at about 4,321 M above sea level. However, most of this mountain is situated on the Ugandan side of the common border between the two East African countries.

1.2.2 Weather and Vegetation

The climate of the country is generally tropical, but the high temperatures are tempered by the high elevations, the valleys and hills in the areas on the border with Tanzania, Uganda, South Sudan and Ethiopia. The climate varies by location, from mostly cool every day, to always warm/hot. Precipitation depends on altitude, with Western Kenya, Central Kenya, the southern and central highlands of the Rift Valley experiencing high amounts of rainfall.

The climate along the coast is tropical, meaning that rainfall and temperatures are high throughout the year. At the coastal cities of Mombasa, Lamu and Malindi, the air changes from cool to hot, almost every day, due to the high relative humidity which makes the air unpleasant to feel. Northern and northeastern parts of Kenya receive low amounts of rainfall, ranging from 250-500 mm annually (Daron, 2014). These low rainfall areas have low crop production potential and are associated with high poverty indices and therefore poor food and nutrition security indicators. Nomadic pastoralism based on local-breed livestock keeping, is the major mode of production and livelihood in these arid and semi-arid parts of the country. This part of the country has 30% of the livestock population in an area that makes up for about 80% of the country's land mass (IUCN, 2020). The vegetation in most of the country is composed of thick woodlands and grassland in the high and wetter elevations, to scanty, hardy and low density thorny shrub vegetation to desert terrain mainly of hardy scrub in the arid and semi-arid plains. For many areas of Kenya, the difference between daytime and night time temperature is about 12 °C, almost every day. Elevation is the major factor in temperature differentials, with the higher areas, on average, being 11 °C cooler in the day or night. The many cities over a kilometre in elevation have temperature swings from roughly 10–26 °C, such that in Nairobi at 1,798 m (5,899 ft), the range is 9–27 °C and in Kitale at 1,825 m (5,988 ft), the temperature range swings from 11 to 28 °C (Christy et al., 2009). At night, it gets very cold in the highlands, with temperature drops of about 10–12 °C from the day temperatures. Lodwar in the north and the northeastern towns of Moyale, Wajir and Mandera have temperatures ranging between 24–26 (night time) and 36–40°C (day time) over the year (Lokuruka, 2008; Christy et al., 2009). At lower altitudes, the increased temperature is like day and night, literally: hence, the overnight low temperatures near sea level are nearly the same as the high temperatures of the elevated Kenyan highlands. However, locations such as Mombasa along the Indian Ocean have more moderate temperatures. Although Kenya is centred at the equator, it shares the seasons of the southern hemisphere: the warmest equivalent summer months being December–March and the equivalent coolest winter months coming in June–August, again with differences in temperature varying by location within the country. On Mount Kenya and Elgon, the weather is bitterly cold for most of the year and in the earlier, snow can be observed on its peaks.

In the following text, the author examines Kenya in terms of economic growth, social and development indicators, and its outlook for food and nutrition security attainment.

2.1 Economy, Agriculture and Social Development

Although the agriculture sector continues to dominate Kenya's economy, only 15-20% of Kenya's total land area has sufficient fertility and rainfall to be farmed and only 7-8% of the land can be classified as first-class agricultural land (World Bank, 2020c). A considerable number of Kenyans make their living off the land, but this trend has continued to decline from the 1980s for various reasons including: rural-urban migration, the low economic gain from the sector, low investment in the sector, rural population growth and the conversion of the agricultural land to residential land, international politics and economics related to the cash crops, and, often, subdivision of farmland for purposes of inheritance (FAO, 2019). Agriculture is the second largest contributor to Kenya's gross domestic product (GDP) after the service sector, and is the engine of the country's economic growth, as about 56% of Kenyans earn all or part of their income from the sector (KNBS, 2019). The sector accounted for 30.2-34.5% of the nation's GDP, between 2015 and 2019 (KNBS, 2019). Despite the increasing country's population, agricultural productivity has stagnated in recent years, necessitating food imports or request for food aid to plug food stock deficits. The 15-20% of Kenya's land area that is suitable for farming is not utilized efficiently. Recurrent crises such as drought add to the agriculture-related challenges, which largely contribute to the high malnutrition rates experienced in the country. In 2013, agriculture, including forestry and fishing, accounted for approximately 28% of GDP, 65% of Kenya's exports, 18% of employment and 50% of revenue from exports (D'Allessandro et al., 2015), underscoring the influence of the sector. In 2017, the sector accounted for 31.5% of GDP (KIPPRA, 2018). The principal cash crops are tea, horticultural produce and coffee; horticultural produce and tea are the main growth sectors and the two most valuable of Kenya's exports, with horticulture accounting for 23% and tea for 22% of total export earnings, with the latter contributing 4% of GDP in 2016 (Invest InGroup, 2020). The value of coffee as a percentage of all export goods represented 5.5% in 2017, while its share of GDP varies between 0.22 and 0.5% (AFA/Coffee Directorate, 2019). Coffee has declined in importance as a result of the depressed world prices, high export taxes and higher value from competing commodities (tea and horticulture). The production of major food staples such as maize is subject to sharp weather-related fluctuations. Production downturns periodically necessitate food aid, which for example in 2014 necessitated the sourcing of food aid for 1.8 million people (USAID, 2014). The expansion of credit to the agricultural sector has enabled farmers to better deal with the large risk of rain-dependent agricultural production and dramatic fluctuations of the prices of agricultural commodities.

Tea, coffee, sisal, pyrethrum, maize, and wheat are grown in the fertile Kenya highlands, which is one of the most successful agricultural production regions in Africa (Invest InGroup, 2020). Livestock keeping predominates in the semi-arid savanna to the north and northeast (FAO, 2011). Coconuts, pineapples, and a host of other tropical fruits, cashew nuts, cotton, sugarcane, sisal, and maize are grown in the low-lying areas (KIPPRA, 2017, 2018, 2019).

Kenya's Vision 2030, the development blue print for the country, was initiated in 2007 by Emilio Mwai Kibaki, the 3rd President of Kenya (GoK, 2007). It has the economic, social and political pillars as its anchors; the economic pillar aims at improving the prosperity of all Kenyans through an economic development programme, covering all the regions of Kenya. It aimed to achieve a GDP growth rate of 10% per annum beginning in 2008, but the country has consistently fallen short of the target every subsequent financial year drawing from growth

figures for 2014, 2015, 2017, 2018, and 2019 of 5.4, 5.6, 4.9, 6.3 and 5.4% (KIPPRA, 2017, 2018, 2019, 2020). However, to work towards achieving the target, Kenya is continuing with the tradition of macro-economic stability that has been established since 2002. The New Administration of President Uhuru M. Kenyatta has picked some key economic and social deliverables in the Vision, in what in 2018, it has characterized as "The Big Four". These are:

1. Universal Healthcare,
2. Manufacturing,
3. Affordable Housing and
4. Food Security,

Through the social pillar and strategy, Kenya aims to build a just and cohesive society with social equity in a clean and secure environment. It therefore, presents comprehensive social interventions aimed at improving the quality of life of all Kenyans and Kenyan residents. This strategy makes special provisions to help persons living with various disabilities and previously marginalized communities, who may lack a good education, are unemployed and experience poor nutritional status due to high poverty prevalence among them. These social policies (and those in the economic pillar) are equally anchored on an all-round strategy of adopting science, technology and innovation (STI) as the implementation tool. The STI concentrates in certain areas for its contribution to the success of the initiative, including:

- Education and vocational/technical training
- Health
- Water and sanitation
- The environment
- Housing and urbanization
- Gender, youth and vulnerable groups
- Equity and poverty elimination, and,
- National integration, cohesion and reconciliation

2.2 Food and Nutrition Security

Kenya had a population of 47.6 million as estimated in the 2019 Population Census (KNBS, 2019) and is generally regarded as water-deficient and food and nutrition insecure. Low budgetary allocation to agriculture has contributed to the current food crisis in Kenya (Gitu, 2004). The total allocation to Agriculture in 2005/06 was 5.7% of the Government budget. In the 2006/7 budget, allocation to agriculture and related sectors had increased to 6.5% and in 2007/08 it rose to 7.8% of the total expenditure (Institute of Economic Affairs, 2008). This was still lower than the recommended 10% by the 2003 Maputo declaration. The target was reached in nominal terms in the 2010/2011 financial year (Ongaro, 2011), but it does not seem to have been maintained in subsequent budgets as shown in recent reports (KIPPRA, 2017, 2018, 2019).

Kenya suffers from frequent droughts and famines with as many as 2-3 million people affected every time a famine or drought occurs, and, about 10-11 million suffering from chronic food insecurity and poor nutrition (UN IGME, 2019). Most of those affected live in the pastoral, semi-arid and arid areas of the country located in the North, Northeast and Northwest of the country, although parts of the Upper Eastern that include the Counties of Kitui, Makueni and Tana River County in the Coastal Region (Figure 1), are often also affected. Some of these arid and semi-arid zones receive as little 250-450 mm of rain annually, and therefore have low crop output (Lokuruka, 2008; Daron, 2014) The other category of consumers that is often affected by food and nutrition insecurity is the slum dwellers, who constitute a considerable percentage of the

country's population, and, live in the inner cities of the major urban settlements. The major cities of Nairobi, Mombasa, Kisumu, Nakuru and Eldoret held about 16% of the country's population in 2010 (NCPD, 2013) and will therefore require significant attention in the effort to reduce food and nutrition insecurity in the country, as they constitute sizeable and extremely poor populations living in city slums. Malnutrition is a public concern and is the single most important contributor to child mortality, which stood at 30.6% in every 1000 births by 2018 (UNICEF, 2019) down from 33.3% in 2015 (KNBS et al., 2015). Malnutrition is mainly due to inadequate food intake and disease, with the underlying factors being poor maternal/child care practices, household food insecurity, and inadequate health services, among others (UNICEF, 2017). Most of the indicators on food availability, access and affordability, poverty levels and nutritional status are obtained through statistics generated from the Integrated Household Budget Surveys (IHBS) and the Kenya Household and Dietary Surveys (KHDS). The latest IHBS and KHDS were done in 2015/2016 fiscal year. The IHBS surveys show different levels of food poverty across the former eight Kenyan Administrative Provinces, which were abolished after the promulgation of the new Kenya Constitution in 2010 (RoK, 2010). They were replaced by 47 Counties (Figure 1), which came into being in March 2013. The IHBS of 2011 showed food poverty rates of 21, 31, 45, 46, 50, 51, 70 and 74% for Nairobi, Central Province, Eastern, Nyanza, Rift Valley, Western, Coast and Northeastern Provinces, respectively (NCPD, 2013). It is likely that the indicators have declined between then and now. Differences are normally also apparent between high rainfall Counties in the former Central Province, Western Province, the former Rift Valley Province (Central and Southern parts) and those where mobile pastoralists are a significant percentage of the population. These latter are the North eastern Province, the northern Rift valley, and parts of the former Coast Province. Most of the northern and northeastern counties fall in what are traditionally referred to as arid and semi-arid lands (ASALs). They compose about 70% of the country's land mass and hold about 20% of the human population and over 60% of the country's livestock population (FAO, 2020a). They are some of the poorest regions of the country, with the worst food poverty, nourishment, health and sanitation indicators. In the pastoralist counties, the factors that seem to be major drivers of food and nutrition insecurity include weather anomalies associated with regular droughts, water scarcity, ethnic resource-based conflicts and displacements, high food prices, depressed livestock sales prices, difficulties associated with access and availability of-water and pasture for livestock herds, cross-border conflicts and livestock pest and disease outbreaks (Huho & Mugalavai, 2010; NCPD, 2013; Lokuruka & Lokuruka, 2014). Climate variability is a recent phenomenon that seems to be adversely affecting food production in both middle-potential and low-potential areas of the country. The agriculture sector continues to play a vital role in the rural economy. The sector was one of the first to fully devolve the function of service provision to the county governments, underscoring the importance of County Governments' role in ensuring food security. The decentralization of resources and governance to the counties from 2013 was expected to improve food and nutrition security in the country through improvements at the county level. For instance, Turkana County in 2013 had a poverty level of 94.5% (TCG, 2013), and under-five stunting, wasting and underweight prevalence of 37, 7 and 27%, respectively (Kuper et al., 2015). In 2018, the county was reported to have a poverty index of 74.8%, a stunting and malnutrition incidences of 20.3 and 17.8%, respectively, compared to the national figures of 7 and 4%, respectively (UNICEF, 2018; TCG, 2018). Though improvements seem to be in sight, a lot requires to be done to continuously endeavour to get the situation better by improving the availability and access to affordable food supplies, health care, sanitation and hygiene in the poorest county in Kenya. At

the other end of the poverty spectrum, Nairobi had a poverty prevalence of 16.7% (KIPPRA, 2020), with that being experienced most by the slum population, casual labourers and the unemployed. There is potential for the food and security situation in the counties to get better with good governance and commitment on the part of the County Governments, but the support of the National level of Government is crucial as it is the main financier of County operations and the policy initiator. A good working relationship between the two levels of government should lead to enhanced food and nutrition security in the country in the long-run.

Having discussed the ASALs, the rest of the country falls under the agrarian belt, where arable farming is practised. In the agrarian belt, the major drivers for food and nutrition insecurity include poor transport infrastructure, poor market access for farm produce, climate variability, late arrival of government subsidized fertilizer and agro-chemicals, late payments to farmers for crop delivered to depots of the National Cereals and Produce Board, poor management of farmers' cooperatives, depressed food sales prices and crop pests and livestock diseases (USAID, 2014; Ehrensperger et al.; 2012; FAO, 2011). The fertilizer use in the country currently stands at 8 Kg/ha compared to 100 kg/ha for developed countries (World Bank, 2019a). Grossly inadequate storage facilities and poor handling and storage practices for cereal grain, pulses and oil seeds, also contribute to food and nutrition insecurity as considerable amounts of produce is lost through microbially-mediated deterioration, physical damage at handling and pest infestation. Poor purchase prices and delayed payments for deliveries to National Government grain depots often encourage sales of the season's harvest to middlemen, who despite offering modest prices compared to government agencies, have the advantage of on-the-spot cash payments for crops bought. It is envisaged that the provision of storage facilities through the National Cereals and Produce Board, Co-operatives, improvement in road infrastructure, the expansion of rural electrification programmes, the adoption of climate-smart agriculture, diversification of the food supply and diets, especially an increase in consumption of fruits and vegetables will lower food and nutrition insecurity indicators and improve consumer nutritional status and health. At the national level, there has been a decline in each of the global health indicators since 2000 (Achoki et al., 2018). The mortality rate of Kenyan children under age five has fallen steadily since 2000 (Kimani-Murage et al., 2014), but remains of concern. Kenya's undernourishment rate, reflecting the share of the population without adequate consumption of calories, declined in 2001–2003 and in 2013–2015, but has risen since then. This increase coincided with the 2016–2017 drought that plagued Kenya and neighbouring countries, sparking drops in agricultural production and increases in food prices (WFP, 2017a, 2017b). Kenya's child stunting and child wasting rates have also fallen considerably. Between 2008 and 2009 and in 2014, the stunting rate dropped from 35.2 to 26.0% and the wasting rate fell from 7.0 to 4.0% (KNBS and ICF Macro, 2010; KNBS et al., 2015). Rates vary substantially between regions and counties, with some having values significantly higher than the national averages. The highest stunting rates were observed in Kitui County at 45.8% and West Pokot County at 45.9% (KNBS et al., 2015). Although these Counties have high poverty rates (48 and 57%, respectively, based on national poverty indicators), stunting in Kenya is not perfectly associated with poverty levels. Rather, it seems to be influenced by a complex set of factors, such as dietary diversity, feeding and caregiving practices, access to adequate sanitation and disease (KNBS, 2018; Dayton, 2016). Wasting was highest in Kenya's northernmost counties: with a value of 22.9% in Turkana, 16.3% in Marsabit, 14.8% in Mandera, 14.3% in OWest Pokot, and 14.2% in Wajir (KNBS et al., 2015). These Counties are arid or semi-arid, and are dominated by pastoralism as a form of livelihood and production and therefore have high rates of poverty (Krathli & Swift, 2014; KNBS

& SID, 2013). Moreover, rates of contraception use and women's education levels in these counties are low and fertility rates are high (KNBS et al., 2015). Indeed, children's nutritional status is also associated with mothers' education and literacy rates in Kenya (Ruel et al., 2013). A study from the City of Nairobi found that maternal education strongly predicts children's nutritional status, even when controlling for other socio-economic and demographic factors (Abuya et al., 2012). Some recent data from Kenya shows that the stunting rate of children whose mothers had no formal education was 31%, compared to that of children whose mothers had secondary education or higher at just 17% (KNBS et al., 2015). Children's nutrition is also associated with mothers' nutritional status and therefore income. A study from rural Kenya showed a positive correlation between maternal nutrition and children's nutritional status in terms of anthropometric measures (Gewa et al., 2012). As Kenya attempts to reduce child under-nutrition further and improve the situation in the Counties, albeit with persistent challenges, it will be crucial to address infant and young child feeding practices. Breastfeeding practices have improved substantially in Kenya, with 61% of children below 6 months of age, being exclusively breastfed in 2014, compared with just 32% in 2008–2009 (KNBS et al., 2015; KNBS & ICF Macro, 2010). However, in 2014, just 22% of children between 6 and 23 months of age received a minimum acceptable diet (KNBS et al., 2015). Additionally, though most food and nutrition analyses of Kenya have traditionally focused on rural areas, where rates of child under-nutrition tend to be higher than in urban areas, Kenya's population is increasingly urbanizing, and urban food insecurity and under-nutrition, are emerging concerns (KNBS et al., 2015; WFP, 2010; Concern Worldwide, 2017). Urban dwellers are highly vulnerable to food price spikes, which affect their access to affordable food, especially the unemployed, casual labourers who mainly live in the sprawling informal settlements of Nairobi, Kisumu, Nakuru, Mombasa and Eldoret, and increasingly in every major urban centre in the country. Moreover, urban populations live in crowded, poor accommodation, and are subject to illness and disease, and often lack adequate water, sanitation and therefore live in unhygienic conditions (WFP, 2010; Concern Worldwide, 2017). Child mortality declined much more slowly in urban than in rural areas of Kenya between 1993 and 2008, perhaps because of the deplorable living conditions in urban settlements (Kimani-Murage et al., 2014), especially among the slum dwellers, who may have larger families sizes, and experience higher food poverty, poor sanitation, crowded accommodation and lack medical insurance. Infant mortality rate in a study based on data from the KHDS studies showed that, Infant mortality rate was highest in urban slums (75) compared with urban as whole (65), rural (56) and Kenya as a whole (58). Child mortality was also highest in urban slums (32) compared with urban as whole (14), rural (23) and Kenya as a whole (21) (Kimani-Murage et al., 2014). Under-5s mortality rate was very high in the urban slums (104) compared with 75, 72.5 and 73 for the urban as a whole, rural and Kenya as a whole, respectively (Kimani-Murage et al., 2014).

Agriculture is considered to have considerable potential to increase household food security and nutrition. Although evidence of the impact of agricultural technologies on relevant outcomes is limited (Kabunga et al., 2014), some studies show promising results in Kenya. Smallholder dairying and pastoralism play an important role in Kenya, with significant implications for nutrition. Roughly about 1 million small scale farmers engage in small-scale dairy activities (IFAD, 2006). A detailed study of pastoralism in four of Kenya's northern, arid counties—Mandera, Marsabit, Turkana, and Wajir (refer to Figure 1) showed that livestock is the main source of livelihood for at least 57% of the households (Njuki et al., 2016; Dayton et al., 2016). For pastoralist households in Kenya, animal ownership is associated with household milk

consumption, and as livestock holdings decrease, so does milk consumption. Milk consumption at the household level was positively associated with higher body mass index in a study among Samburu youth (Iannotti, 2014). Consumption of animal-source foods by Kenyan schoolchildren was also shown to be positively associated with height and weight gains. A school-feeding programme that tested the effect of different types of snacks given to children found that meat and milk snacks contributed the most to children's arm muscle growth (Neumann et al., 2012). Kenya is engaged in cash transfer initiatives as a way to lift the poor out of food and nutrition insecurity. The unconditional cash transfer programme for Orphans and Vulnerable Children increased households' food expenditures and dietary diversity, and the consumption of food produced by households themselves. The unconditional cash transfer programme in rural Kenya also increased households' food security and food expenditures, particularly when the transfers are made monthly rather than in a lump sum (Haushofer and Shapiro, 2016). Kenya's Hunger Safety Net Programme, an unconditional cash transfer programme, boosted beneficiaries' food consumption relative to controls and increased dietary diversity for poorer households in the project (Merttens et al., 2013; OPM & ID, 2013). Nutrition education can help improve diet quality for children and adults in Kenya as well. A pilot project in western Kenya found that providing nutrition education to fathers and grandmothers on proper complementary feeding practices for young children, raised social support for mothers, and, improved some types of child feeding practices (Mukuria et al., 2016). Despite the need to continue addressing malnutrition in the country, micronutrient deficiencies of Vitamin A, Folic acid, Iron, Zinc and Iodine are widespread, with the re-emerging rise in rickets. Other emerging issues include child overweight/obesity, where female children generally are more obese and overweight than their male counterparts (Adamo et al., 2010), with figures of 6.3% for girls and 3.8% for boys in this study in rural Kenya.



Figure 1: The Counties of Kenya

OUTLOOK

The operationalization of the Food and Nutrition Security Policy of 2011, the placement of access to quality and adequate food for citizens in the new Kenya Constitution of 2010 (WFP, 2017a; RoK, 2010) as a human right, and support programmes arising thereof, are providing a firm foundation for the country to effectively address the issues of food and nutrition insecurity in a planned and focussed manner. This is backed by an increasing number of interventions from the National and the County Government levels, and International non-Governmental Organizations, with the most notable being the World Food Programme (WFP) and UNICEF, with the focus for the latter being on women and children. The Food and Nutrition Policy of 2011 is themed on 3 areas:

- a) Achieving good nutrition for optimum health of all Kenyans
- b) Increasing the quality of the food and ensuring that it is available, accessible and affordable to all Kenyans, at all times
- c) Protecting vulnerable populations using innovative and cost-effective safety nets, that are linked to long-term development issues

The policy broadly recommends providing specific crops for specific agro-climatic zones of the country. With the focus being on the child, one intervention and recommendation from the policy is providing food subsidy and food aid to vulnerable groups and children, in the latter case by strengthening and making school feeding programmes work. The WFP has for many years sustained the school feeding programmes in the semi-arid and arid parts of the country, despite the programme sometimes facing logistical as well as policy difficulties. There are other policy instruments that are currently either being finalized or implemented. Major areas of focus that can boost agricultural production and eventually reduce food and nutrition insecurity in Kenya include but are not limited to:

- Enhancing access to agricultural financing: While Kenya represents a vibrant and enabling market for agricultural produce, the hunger by the banking sector to service commercial agriculture is lacking, as only about 4% of commercial bank lending is for agribusiness, despite most Kenyans being employed in agriculture or agribusinesses.
- Increasing the use of fertilizer-Fertilizer use remains inadequate in Kenya (8 kg/ha) (World Bank, 2019a) as the government's fertilizer subsidy program is inefficient, often benefiting disproportionately more medium/large scale farmers than small-scale farmers. Small scale farmers are the backbone of the country's agriculture sector. Making the scheme work for small scale farmers and ensuring that it is efficient, transparent, and targets them, has the potential of raising agricultural output and productivity.
- Undertaking potentially high productivity expenditures, e.g., extension services and farmer training. Government intervention through the policy may keep food prices down and benefit food and nutrition security initiatives for households in poorer parts of the country.
- Investing in irrigation-while 83% of Kenya's land area is arid and semi-arid, 2% of arable land is under irrigation compared to an average of 6% in the whole of Sub-Saharan Africa and 37% in Asia (FAO, 2002). The low usage of irrigation means that Kenya's agriculture is fully rain-dependent and susceptible to shocks due to droughts. Investing in

irrigation and agricultural water management for smallholders can reduce productivity shocks and raise the sector's total factor productivity, potentially climate-proofing the sector.

- Supporting stronger farmer organizations-Kenya has many geographically dispersed smallholders who are not integrated into key agriculture value chains. Dispersion increases production and transport costs and reduces small farmers' competitiveness. The analysis shows that stronger farmer-organizations could foster economic inclusion of smallholders and increase their market power, thereby raising their incomes and productivity. Further, while value addition to agricultural commodities remains low, increasing the agribusiness to agriculture ratio could create more jobs and reduce poverty.

CONCLUSIONS

In conclusion, a decade of rapid economic growth from 2003-2013, the inclusion of food and nutrition security in the government's 'big four' priorities in 2018, constitutional changes that devolved administrative responsibilities to county governments since 2013, and the country's openness to innovation, offer opportunities for the achievement of Sustainable Development Goal 2 on Zero Hunger and improved nutrition in Kenya. However, even though the country has recently acquired lower-middle-income status, the increased wealth has not benefited all Kenyans equally. Over one third of the population still lives under the international poverty threshold of USD 1.90/day and social, economic and gender disparities remain. Access to adequate quantities of nutritious food remains a challenge for many, especially in arid and semi-arid regions which make up over 70% of the country's land area. Rapid population growth, at a rate of 2.9% a year, climate variability, stagnating agricultural production and inefficient food value chains are additional challenges. Most food insecure families typically live in rural areas, are poor and depend on daily agricultural labour for income or remittances from formally employed relatives. Pastoral families fall into the high poverty category. The high dependence on livestock rearing, low educational attainment for most of the pastoralist population, large family sizes means that they will take long to achieve acceptable food and nutrition security status. Some recommendations to address some of the above concerns follow.

RECOMMENDATIONS

- The National and County Governments should minimize climate variability effects on the agriculture sector by expanding viable irrigation schemes, emphasizing the adoption of drought-tolerant crops including cassava, sorghum, millet, potatoes and small dairy stock by households. These animals require small spaces to keep, have manageable feed and water requirements and are potential sources of income and high biological value protein in the form of meat and milk for families
- The country should continue scaling up programmes for treatment of malnutrition among vulnerable groups as well as implementing common public health measures such as vaccination, deworming, supplementation and water and sanitation in pastoralist counties, where livestock keeping is a major economic activity in an environment of ever-present pasture and water stress
- Prioritize policies and programmes that increase farm and crop productivity, food and nutrition security, and resilience of small-scale farmers and pastoralists. Such steps will

be increasingly vital for Kenya's future food and nutrition security improvement given the large share of the population that is dependent on pastoralism and rain-fed agriculture and the vulnerability of these groups to climate variability and droughts

- Continue promoting education for women and girls, particularly in areas dominated by pastoralism, which are characterized by low female education attainment rates and high child wasting rates. Women's education and child nutrition have been shown to be positively linked.
- Strengthen support for improvements in the water, sanitation, and hygiene (WASH) environment in Kenya, including implementation of the provisions of the Kenya Environmental Sanitation and Hygiene Policy, 2016–2030. Poor urban settlements, rural areas, and informal settlements of the major cities face the lowest levels of hygiene and sanitation, often lacking them, when compared with planned urban areas. Inadequate WASH facilities and inappropriate practices are detrimental to human health and nutrition.
- Strengthen political and educational support to the production, distribution, and consumption of nutritious crops such as vitamin A-rich orange-fleshed sweet potatoes and green and yellow leafy vegetables, and ensure that low income households have access to these products, either by way of them being affordable or as food aid, where the concerned citizens are extremely poor, single, and living with disabilities and/or are unemployed over long periods of time
- Ensure that food security and good nutrition are given priority at the national and county levels, recognizing the vital role that County governments must play given Kenya's devolved government structure. Food security and nutrition decisions should be guided by the data that exists at the county level.
- The Food Security Bill, 2017, and the National Nutrition Action Plan, 2018–2022, require good implementation plans to ensure that food and nutrition security is prioritized in Kenya
- Enforce the provisions of The Breastfeeding Mothers Bill (2017), which aims to protect women's right to breastfeed in the workplace and public places. This bill once enforced should further promote breastfeeding in Kenya, which is critical to infant nutrition
- Increase investment to strengthen community capacity to prepare for future nutrition crises by providing staffing, training, and resources for community-based management of acute malnutrition
- Support innovative programmes that incorporate contributions from local, and international partners in response to nutrition crises

ACRONYMS

FAO-Food and Agriculture Organization of the United Nations

GDP-Gross Domestic Product

RoK-Republic of Kenya

KNBS-Kenya National Bureau of Statistics

SDGs-Sustainable Development Goals

TCG-Turkana County Government

UN IGME-UN InterAgency Group for Child Mortality Estimation

WFP-World Food Programme

WASH-Water, Sanitation and Hygiene

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