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Food and Nutrition Scenario of Kenya

Haradhan Kumar Mohajan*

Assistant Professor, Premier University, Chittagong, Bangladesh
*Corresponding author: haradhan_km@yahoo.com

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Abstract Republic of Kenya is the fourth largest economy in Sub-Saharan Africa. More than 60% people of Kenya live below the poverty line. Rapid increases in inflation could reduce economic growth and worsen the poverty levels of the citizens of Kenya. The agricultural sector is still the backbone of Kenya's economy and economic development is dependent on agricultural improvement. Main staple food of Kenya is maize, which accounted about 65% of total staple food caloric intake and 36% of total food caloric intake. Kenya is the largest food and agricultural products importer in the eastern Africa. At present the Government of the country is trying to reduce poverty. The country is developing in food security and nutrition since the last decade. To make the country in a medium develop Government should stress on food security, poverty reduction, transformation of agriculture from survival to commercial farming and agribusiness, markets, efficient use of agricultural products. The objective of this paper is to increase food production of Kenya to reduce food insecurity and malnutrition. An attempt has been taken here to discuss the food and nutrition situation of Kenya to build a healthy nation.

Keywords: *agriculture, food aid, food security, inflation, nutrition*

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1. Introduction

Republic of Kenya is the 4th largest economy in Sub-Saharan Africa (SSA) and Nairobi is its capital city. Mombasa is the main sea port of the country. Kenya is named after a mountain (5,199 m above sea level) of the same name of the country. English is the official language and Kiswahili is the national language of Kenya. Its area is 580,400 km^2, which is 49th largest country in the world and water area is 11,227 km^2 (2.3% of the total area) and forest area is 6% of the total land. It is the 6th most populated country in SSA and the 31st largest populated country in the world with estimated 45 million inhabitants in 2014. The density of population is 69 persons/km^2, which is the 140th densely populated country in the world. The population distribution varies from 230 persons per km^2 in high potential areas to 3 persons per km^2 in arid areas [7].

Kenya lies between latitudes 5° N and 5° S and between longitudes 34° E and 42° E. It is almost bisected by the equator. It is bordered by the Indian Ocean to the southeast, Somalia to the east, Ethiopia to the north, Sudan to the northwest, Uganda to the west, and Tanzania to the south. The coastline is about 536 km (Figure 1). It is divided into 8 provinces (Central, Coast, Eastern, Nairobi, North Eastern, Nyanza, Rift Valley and Western) and 72 districts. It became independent from Britain in 12 December 1963, United Nations membership date was in 16 December 1963 and declaration of Republic was in 12 December 1964. Jomo Kenyatta, considered the founding father of Kenya, led the country from 1963 until 1978. Under his rule, the Kenya Action National Union (KANU) was the only legal political party in Kenya. It is situated on Africa's east coast, and it has been described as "the cradle of humanity". In the Great Rift Valley palaeontologists have discovered some of the earliest evidence of man's ancestors [8].

With its natural scenic beauty and abundant wildlife, the country is one of Africa's major safari destinations. Natural resources are limestone, soda ash, salt, gemstones, fluorspar, zinc, diatomite, gypsum, wildlife, and hydropower [8].

Kenya is divided into seven ecological zones: Tropical Alpine, Upper Highland, Lower Highland, Upper Midland, Lower Midland, Lowland and Coastal Lowland. The country has unusually diverse physical environment, including savanna grasslands and woodlands, tropical rain forest and semi-desert environments [18].

The country has a vast tourist spots such as; vast plains which are home to world famous game parks and reserves; the Great Rift Valley, which runs north to south and whose floor has provided potential for geothermal power generation; Mount Kenya, the second highest mountain in Africa; Lake Victoria, the largest freshwater lake on the continent supporting a major fishing industry in the East Africa region; Lake Nakuru, a major tourist attraction because of its flamingos; Lake Magadi, famous for its soda ash [27]. From a low coastal plain on the Indian Ocean in a series of mountain ridges and plateaus which stand above 3,000 m in the center of the country. The Rift Valley bisects the country above Nairobi, opening up to a broad arid plain in the north. Mountain plains cover the south before descending to the shores of Lake Victoria in the west. Highest elevation is Mount Kenya (Kirinyaga 5,199 m) [7].

It has 42 ethnic communities. Among them about 22% is Kikuyu, 14% is Luhya, 13% is Luo, 12% is Kalenjin, 11% is Kamba, 6% is Kisii, 6% is Meru, 15% is other African and 1% is non-African (Asian, European, and Arab). Religions of the country are [8]: Christian 82.5% (Protestant 47.4%, Catholic 23.3%, other 11.8%), Muslim 11.1%, Traditionalists 1.6%, other 1.7%, none 2.4%, unspecified 0.7% (2009 census). In 2009, literacy rate of Kenya was 87.4% (male 90.6% and female 84.2%) of the total population whose age is 15 and over.

Population growth rate is 2.27% in 2013 and population growth rates of the previous 8 years are given in Table 1. Fertility rate is 4.6 live births per women [8].

Name of the national currency is Kenyan Shilling (KES or KSh, 1KSh = 100 cents) and exchange rate is 1$ = 85.07 KSh in 2012. The gross domestic product (GDP) per capita is $1,800 as of 2011 in purchasing power parity (PPP) terms [3]. GDP per capita only reflects average national income. The economy of the country relies largely on agriculture and tourism. In Kenya more urban children are attending secondary school than rural children. Urban households have better access to safe water and sanitation than the rural households.

More than 60% people of Kenya live below the poverty line (less than $1.25 a day or unable to afford to buy food providing a daily intake of 2,100 kilocalories). These people are asset less or have few assets and cultivating small pieces of land inadequate to sustain a living. The economy of the country has been recovering over recent years. Kenya faces the classic food price dilemma, how to keep farm prices high enough to provide production strengthening motivations for farmers while at the same time keeping them low enough to ensure poor consumers' access to food. Food price instability is another major problem in Kenya, which is frequently identified as a major obstruction to smallholder productivity growth and food security [28].

Rapid increases in inflation could reduce economic growth and worsen the poverty levels of the citizens of the country. Inflation, corruption, crumbling infrastructure and high inequality continue to hinder the nation's development [2].

Malnutrition in Kenya is a major problem in the progress to build a healthy nation. It is not only a threat to achieving Millennium Development Goals (MDGs) and Vision 2030 but also a clear indication of inadequate realization of human rights. The Vision 2030 development process of Kenya was launched by President Mwai Kibaki on 30 October 2006 when he instructed the National Vision Steering Committee to produce a medium-term plan with full details on the development programmes that would be implemented in the first five years after the ERS expires on 31 December 2007. The objective of all these consultations was to provide an in-depth understanding of the country's development problems and the necessary strategies to achieve the 2030 goals. Transformation within Kenya's political Governance system under Vision 2030 is expected to take place across six strategic initiatives, whose overarching visions, goals and specific strategies for 2012 are as follows:

1. Rule of law.
2. Electoral and political processes.
3. Democracy and public service delivery.
4. Transparency and accountability.
5. Security, peace building and conflict management.

The solutions to malnutrition are practical, basic and have to be applied at scale and prioritized in the national development agenda [32].

Kenya has climatic and ecological extremes with altitude varying from sea level to over 5,000 m in the highlands (in the south-eastern part of the country). Rainfall and temperatures are influenced by altitude and proximity to lakes or the ocean. The mean annual rainfall ranges from less than 250 mm in semi-arid and arid areas to more than 2,000 mm in areas with high agricultural potential [20].

In Kenya the agricultural growth reached an average of 5.2% by 2007 with the highest being 6.2% in 2006 but it was interrupted in 2008 by external factors [18].

Urban population of it is 24.4% of total population and increase rate **of urbanization is** 4.36% per year in 2011. Life expectancy (at birth) of the **total population in 2013 is about** 63.29 years (**male** 61.84 years and **female** 64.77 years). Infant mortality rate is 58.1 per thousand live births [8].

Table 1. Population growth rate of Kenya, Source: [8]

2005	2006	2007	2008	2009	2010	2011	2012
2.56	2.57	2.8	2.76	2.69	2.59	2.46	2.44

2. Objective of the Study

The objective of this study is to discuss food and nutrition situation of Kenya. Maize is the basic staple of the Kenyan diet, which accounted about 65% of total staple food caloric intake and 36% of total food caloric intake. Increase of food production is an important issue in Kenya. The study stresses on the increase of food production to reduce food insecurity and malnutrition. After the independence in 1963, the country was able to develop in food and nutrition sector but yet about half of the populations live below the poverty line. The Government of Kenya (GoK) is trying to develop the country in food and nutrition and is taking various attempts to reduce poverty and malnutrition. This study discusses food and nutrition condition of the country and stresses on the development in these two sectors. The paper also discusses how the country will develop economically and will build a healthy nation in future. The aim of the study is that no person of Kenya will be deprived from the right of food and nutrition.

3. Agriculture Sector

The agricultural sector is the backbone of Kenya's economy which directly contributing 26% of the GDP annually, and another 25% indirectly. It supplies 65% of Kenya's total exports and provides more than 18% of formal employment. More than 40 million people live in Kenya, 80% of them live in rural areas and rely almost entirely on agriculture [18].

The country's food and nutrition insecurity is often allowed to the performance of the agricultural sector [33]. The area of Kenya is 580,400 km^2 but only 12% of the total area is considered high potential for farming and intensive livestock production. This potentially arable land is dominated by commercial agriculture with cropland occupying 31%, grazing land 30%, and forests 22% and the rest of the land is used for game parks, urban centers, markets, homesteads and infrastructure. A further 5.5%, which is classified as medium potential, mainly supports livestock, especially sheep and goats. Only 60% land of Kenyan high and medium potential land is devoted to crops, such as maize, coffee, tea, horticultural crops, etc. and the rest is used for grazing and forests. About 84% of the total land in Kenya is classified as arid and semi-arid, mainly in the northern and eastern regions. It is estimated that the arid and semi-arid areas support about 25% of the nation's human population and slightly over 50% of its livestock ([18,26]). Only 0.97% land of Kenya is used for the production of permanent crops.

In Kenya, land tenure is classified into three main categories i) communal land, ii) Government trust land, and iii) privately owned land. The communal land ownership system is based on traditional customary rights, and all individuals born in that community have a right to use but cannot sell it. Government trust land is land held by ministries, state corporations or other public institutions for public use such as buildings, forests, research and national parks. Privately owned lands are registered; the owner holds the title under a freehold or leasehold system [18].

Agriculture, mainly rainfed, is the main sector of the Kenyan economy. Stagnation of food production, an unfavorable economic environment and poverty are the major causes of food insecurity in the country [20]. About 74% of the economically active population works in agriculture and of these about 80% are smallholders [14].

Kenya is classified as one of the water-deficient countries in the world and irrigation-based farming is still limited. Water resources are unevenly distributed in space and time. About 56% of all the country's water resources are in the Lake Victoria basin and the water of the lake cannot be used for irrigation in remote areas. Large commercial farms account for 40% of irrigated land, smallholder farmers 42%, and Government-managed schemes 18% [18].

Tea, coffee, sisal, pyrethrum, corn, and wheat are grown in the fertile highlands. Livestock predominates in the semi-arid savanna to the north and east. Coconuts, cashew nuts, pineapples, cotton, sugarcane, sisal and corn are grown in the lower-lying areas [15].

Agriculture is the 2nd largest GDP provider to Kenya, after the service sector. In 2005 agriculture, including forestry and fishing, which accounted for 24% of GDP, as well as for 18% of wage employment and 50% of revenue from exports. The principal cash crops are tea, horticultural produce, and coffee. The production of major food staples such as corn is subject to sharp weather-related fluctuations. Pigeon peas (new verity of crops) are very drought resistant, so can be grown in areas with less than 650 mm annual rainfall [15].

In Kenya economic development is dependent on agricultural improvement. Government of Kenya (GoK) has taken various steps to industrialize the country but it still remains an agricultural dominated nation. About 90% of the populations of the rural areas depend directly or indirectly on agriculture for their household income. The performance of the agricultural sector for the last 35 years has been in very poor position. Growth in agricultural GDP declined about 4% in the 1980s compared to the previous decade. In 2013 agriculture production has not kept rapidity with population growth rate and the country has become a net importer of its two major staple foods, maize and wheat. Hence to keep the country self dependent in food it is urgent need for agriculture expansion and development. Mosher [29] describes various ways in which agricultural expansion and development can be firmly accelerated. One of them is provision of agricultural education and training through schools, colleges and extension of education. The per capita production of maize, the main source of food calories in Kenya, has declined from 129 kg in 1970 to 72 kg per capita in 2000. Production of the major cash crops, such as, sugar, coffee, etc., stagnated or declined over the same period [13].

National supply for staple foods in 2008 is as follows: maize 2.4 million tons against a national requirement of 3.1 million tons, wheat 360,000 tons against national requirement of 900,000 tons, rice 120,000 tons against national requirement of 280,000 tons [12].

Kenya's agriculture is mainly small-scale farming in the high-potential areas (average 0.2–3 hectare (ha)). The small-scale production is 75% of the total agricultural output and 70% of marketed agricultural products. These farmers produce more than 70% of maize, 65% of coffee, 50% of tea, 80% of milk, 85% of fish, and 70% of beef and related products [18]. Kenyan smallholders received less than one-half of the auction prices of coffee. As a result coffee output declined from about 128,700 tons in 1988 to 51,700 tons in 2002 [17]. This is because of negligence of the smallholders and their coffee farm and the poor management.

As like coffee, tea production has declined in the last three decades. Data from six major tea-producing districts show that the average green leaf tea declined 8,300 kg per hectare to around 5,500 kg per hectare because of low inputs use, poor husbandry practices, tea collection problems at buying centers, and payment problems [9].

The vision 2030 particularly recognizes that agriculture will continue to play a crucial role towards the achievement of a sustained GDP growth rate of 10% annually in Kenya. To achieve MDG the GoK has taken steps to develop agriculture sector by [18];

1. transforming uncultivable lands in agriculture, livestock, forestry and wildlife to uphold agricultural growth,
2. increasing productivity of crops, livestock and tree cover,
3. introducing land-use policies for better use of high- and medium-potential lands,
4. developing more irrigable areas in arid and semi-arid lands for both crops and livestock,
5. improving market access for smallholders through better supply chain management, and
6. adding value to farm, livestock and forestry products before they reach local, regional and international markets.

The country has not attained the level of investment and efficiency in agriculture that can guarantee food security and coupled with resulting poverty, a significant portion of the population regularly starves and is heavily dependent on food aid.

Figure 1. Map of Republic of Kenya

The cooperatives became unreliable and inefficient in the last three decades. For example, in the case of coffee, the mismanagement, politicization, and uneconomic fragmentation of cooperatives due to local factionalism, combined with huge levels of indebtedness, have made the transaction costs of marketing very high, which decline in coffee production. Poor roads, an inadequate railway network, under-used water transport and expensive air transport have isolated mostly arid and semi-arid areas and farmers in other regions often leave food to decay in the fields because they cannot access markets [9].

In Kenya smallholder farms have increased significantly over the last 10 years. Production of maize has increased from 1.5 to 3 tons per hectare due to application of better technology transfer and extension services.

3.1. Agricultural Subsectors

The agricultural sector comprises of six subsectors: industrial crops, food crops, horticulture, livestock, fisheries and forestry [19]. In this section we will discuss only two subsectors: livestock and fisheries and food subsector is discussed in section 4. Although horticulture is related to food and nutrition we have not discussed it elaborately in this paper. Forestry is not directly related with food and nutrition and willingly ignored from our discussion.

3.1.1. Livestock Subsector

Livestock products in Kenya are milk, beef, mutton, goat meat, pork, poultry and eggs. On average, 4 billion liters of milk is produced annually while local milk demand is 2.8 billion liters. The meat subsector is dominated by red meat (beef, mutton and goat meat). Red meat accounts for about 70% of the meat consumed locally while white meat (pork and poultry) makes up the remaining 30%. The production of red meat is 430,000 tons against national requirement of 330,000 tons while white meat is 40,000 tons against requirement of 39,600 tons [23].

The livestock subsector contributes 7% of the GDP. Animals are a source of food, protein for human diets, income, employment and foreign exchange. They also provide draught power, organic fertilizer for crop production and a means of transportation [18]. Livestock production plays a major role in the food security and the economy of the country since it sustains the livelihood of the population living in the arid and semi-arid areas [13].

The major challenges in production and supply of breeding stock are; the high mortality rate of young stock, inadequate breeding and recording services, and an under-performing artificial insemination service, which was unprepared during privatization and consequently uptake of the service by the private sector has been low. The cost of breeding animals is beyond the reach of most smallholder farmers and GoK should take steps urgently to provide breeding facilities in free of cost to the smallholder farmers for the development of this subsector [18].

To improve livestock national policies for livestock, poultry, livestock breeding, animal disease control, animal welfare, apiculture, dairy development, animal feedstuff and veterinary pharmaceuticals are essential. To develop livestock it is need to improve livestock breeds, improve feeds regulation, develop pastures and forage, and enhance research and extension services. At present livestock productivity is negatively affected by poor genetic make-up. To increase production of milk and meat it is need to improve breeding using superior genetics. Disease and pest control is a key input for increased livestock productivity. The treatment of the avian influenza, the Rift Valley fever and physician payment reform (PPR) must be increased to make the livestock subsector world class standard. The livestock marketing and processing facilities must be updated to enhance the production of this subsector. Adding value to hides, skins and leather should be prioritized for the economic development [18].

3.1.2. Fisheries Subsector

The fisheries subsector plays an important role in Kenyan national economy. About 80,000 people directly and about 800,000 indirectly involve with this subsector. In 2006, it contributed 0.5% of the national GDP. Fish exports in 2005 earned the country about KSh 5 billion [33].

This subsector faces various problems such as, cold storage, roads, fish port and electricity; inadequate budgetary provisions; environmental degradation due to invasive weeds such as water hyacinth; weak producer organizations; lack of collateral and access to credit facilities; absence of a saving culture; ineffective marketing information; and lack of adequate and quality fish seed and feed. This subsector also faces inadequate research; illegal, unregulated and unreported fishing; weak monitoring control and surveillance systems; low fishing technology; stringent sanitary and phytosanitary standards set by major export destinations; tariff and non-tariff barriers to international trade and diminishing fish stocks [19].

Development of marine capture fisheries, inland capture fisheries and aquaculture are needed to make this subsector strong. It is needed to promote fish safety, quality assurance, value addition and marketing facilities. The marine fishery potential is estimated at 150,000 tons annually. This fishery is currently exploited by foreign vessels, which land their fish harvest at off-shore island states in the Indian Ocean due to the absence of a fish port in Kenya. The country immediately needs a fish port with adequate infrastructure to handle up to 500 fishing vessels per day [18].

In 2006, about 94% of the national annual catch was from the fresh waters of Lakes Victoria, Turkana, Baringo, Naivasha and Jipe, and Tana River dams by some 38,000 mainly artisanal fishers operating slightly over 12,200 fishing boats which is overexploited and overfished, operating beyond the maximum sustainable yield. If this state is continue the fishery subsector can face serious difficulties in future [33].

3.2. Scope to Develop the Agriculture

Kenya is highly educated among the African countries. It has abundant educated human resources that can be used in training and research to develop new and relevant technologies, and to create and expand agribusinesses. Major crop and livestock production can be tripled by using modern technologies. Global demand for horticultural products and emerging livestock such as ostrich, guinea fowl, crocodile, frogs and butterflies, gumarabic can open the door to export agricultural commodities and develop the country economically. About 91% of total agricultural exports are in raw or semi-processed form and the country loses billions in earnings by not adding value to its produce. By value addition in agricultural products and reviewing taxation on agriculture farmers and the country can increase huge foreign reserve. Irrigation potential of Kenya is estimated at 540,000 ha of which only about 105,000 ha is exploited. Irrigation can be expanded by 1 million ha by developing the Tana and Athi basins and Lake Victoria shoreline. In the high-rainfall areas, there is immense potential to develop the dairy, poultry and pig industries ([18,33]).

3.3. Attempts to Develop the Agriculture

Assuming favorable external environment and support from enabling sectors and factors, the agricultural sector has set the following targets to be achieved by 2015 [18]:

Reduced number of people living below absolute poverty lines to less than 25% to achieve the first Millennium Development Goal (MDG).

Reduced food insecurity by 30% to surpass the MDGs.

Increased contribution of agriculture to the GDP by more than KSh 80 billion per year as set out in Vision 2030.

Divest from all state corporations handling production, processing and marketing that can be better done by the private sector.

Reformed and streamlined agricultural services such as in research, extension, training and regulatory institutions to make them effective and efficient.

4. Staple Food

Maize is the most important cereal crop in Kenya. It is the main staple food of the country which provide more than one-third of the caloric intake. In terms of land usage, maize accounts for about 56% of cultivated land in Kenya [24].

Most Kenyans prefer white corn flour to produce *ugali* which is a thick porridge of maize meal that is usually eaten with a sauce of vegetables or meat, or simply accompanied with fermented milk, as part of their daily food intake. In average a person consumes 88 kg of maize products per year. Wheat is the second most important staple food in Kenya, which accounted for 17% of staple food consumption. Beans are the third most important staple food nationally; accounting for 9% of staple food calories and 5% of total food calories in the national diet. Other foods taken by Kenyans are potatoes, plantains, and rice. Kenya has to import wheat and rice, as the country has short of food. According to Food and Agriculture Organization of the United States (FAO) statistics [16], in Kenya the average food intake is 2,155 Kcal/person/day. Of this, 1,183 kilocalories (55%) are in the form of the main staples: maize, wheat, beans, potatoes, plantains, and rice.

In Kenya, maize is considered as an inferior food, as its share in staple food expenditures is highest among the poor. Maize accounts for about 20% of total food expenditures among the poorest [30]. Recently in urban areas of Kenya use of wheat and rice is increasing.

Dishes of boiled maize and beans (*githeri*) and maize, beans, vegetables and potatoes (*irio*) are also common food of Kenyans. Mashed plantain (*matoke*) is an alternative food to maize. Other staples are cassava and sweet potatoes, and rice in urban areas. Milk and dairy products are also a part of the diet especially in pastoral communities [20].

Kenya's 2011 National Food and Nutrition Security Policy (NFNSP) indicates that in the past 30 years, per capita food availability has in fact declined by more than 10% [33].

4.1. Food Insecurity

Food security in Kenya has generally been viewed as synonymous with maize security. The World Health Organization (WHO) states the food security as:

"*When all people, at all times have physical and economic access to adequate/sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life*."

A new definition emerged at 1996 World Food Summit; this time with the emphasis being on individuals enjoying food security, rather than the nation. According to the FAO, food security "exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

Food security can be defined as the ability of countries, regions or individuals to meet their year round target calorie food requirements through domestic production, storage and international trade [10]. A family has food security if it can consistently satisfy 80% or more of its nutritional requirements. Mwangi [31] defines food security as the access to enough food by the people for active and healthy living.

The four components of food security in any country are: 1) food availability, 2) food accessibility, 3) food stability and 4) food utilization/nutrition. Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Kenya is a low-income food-deficit country. In 2004, it was estimated that more than 10 million Kenyans were experiencing chronic hunger, with only a small decline in absolute numbers over the ten-year period ending in 2002. Food insecurity in Kenya is because of inadequate market and transport infrastructure and low income and purchasing power due to poverty [36].

During the period 1965–67 to 2000–02, the supplies of cereals and starchy roots have declined while that of fruit and vegetables, milk and eggs, vegetable oils and sweeteners have increased. The per capita supply of cereals fell from 408g/day in 1965–67 to 326 g/day in 2000–02. A series of droughts occurred in 1993, 1996 and from mid-1999 to mid-2002 causing important shortcomings in cereal production. Maize and wheat are the main components of the supply of cereals. Maize is essentially locally produced while 70% of wheat was imported in 2002 [16].

Kenya is dependent on food imports, principally of cereals (wheat and rice) which represented 13% of the Dietary Energy Supply (DES) in 2000–02. Since 1979–81, the imports of vegetable oils have steadily increased. The country exports some soybean oil and imports large quantities of palm oil. The import of sweeteners represented about 2% of the DES in 2000–02 [20].

Government of Kenya (GoK) has endeavored to achieve national, household and individual food security throughout the country but national food security has not guaranteed household food availability and accessibility.

When households produce enough staple crops for their own consumption or when they have enough stock of food to sell in the market after their yearly consumption and they are capable of maintaining a balance diet in their everyday life. Maize is the staple food for the people of Kenya. So that efficient production of maize will provide them food security. Maize production has decreased due to recurrent droughts. As a result, maize prices increased with severe consequences on household food security because this food is the main staple. The supply of starchy roots, mainly potatoes and cassava locally produced, decreased from 214 g/per capita/day in 1965–67 to 152 g/per capita/day in 2000–02 [20].

Food availability in Kenya is not satisfactory and about one-third of the Kenyan's the average daily caloric intake availability is below the recommended level of 2,100 Kcal/person/day. In Kenya, 30% of the food consumed by rural households is purchased, while 70% is derived from own production. On the other hand, 98% of food consumed in urban areas is purchased while 2% is own production [28].

By 2007 food insecurity had been reduced by 12% from 48.5 to 36.5%, while poverty had been reduced by 10%

from 56 to 46%. The categories of persons in food insecurity in Kenya are; pregnant women and lactating mothers (1.1 million); children under 5 years (5.3 million); elderly people above 55 years (1.8 million); AIDS orphans (1.8 million); people living with AIDS (2.2 million); and people suffering from tuberculosis (32,000), and malaria (6.7 million cases reported each year) [27].

4.2. Malnutrition in Urban Slums

SSA is rapidly urbanizing and it has the highest proportion of slum dwellers in the world. In Kenya, about 24.4% of the population is urban in 2011. Unfortunately half of these urban populations live in slums areas. Malnutrition is a major problem, particularly amongst the urban poor of this country. They have no bank account or personal savings; living conditions and education levels are very lower [18]. For the greater reliance on cash income and limited access to land for agricultural production, the urban poor may be more vulnerable to food and fuel price shocks than those in rural areas [34]. At least 3.5 million urban dwellers in Kenyan cities have difficulty meeting their food needs on a regular basis [25].

In 2008, Kenya Food Security Steering Group (KFSSG) expressed that in urban areas over 90% of food comes from markets, 59% of food in the marginal agricultural areas of Kenya comes from market purchases, 37% from own farm produce, 1% from hunting and gathering, and 2% from gifts and food aid [25].

4.3. Poverty

The Kenyan economy grew rapidly in the period immediately following independence, and this growth continues into the 1970s, when growth averaged 7.8% year. Toward the end of the 1970s, Kenya's economic performance began to deteriorate. During the last three decades, Kenya's economic growth performance has been disappointing and consequently poverty has increased. There are many reasons for this increase of poverty, such as, poor governance, slow and incomplete economic reforms, low investment, poor public services delivery, underinvestment in infrastructure, corruption, increase of HIV/AIDS, the deteriorating security situation, political uncertainty and weak judiciary [21].

In Kenya, three different poverty lines are used: (i) the food, (ii) hardcore, and (iii) overall poverty lines. The food poverty line captures the number of people not able to meet the minimum food (2,250 kilocalories per day) requirement. In Kenya a larger share of the rural population is food poor than of the urban population. The overall poverty line sums the expenditure required to meet the daily minimum caloric intake and the necessary non-food expenditure. The hardcore poverty line is where total expenditure equals the food poverty line. Hence, the hardcore poor are those who do not have enough to eat even after spending all their income on food ([21,22]).

The root causes of hunger in Kenya are poverty, unemployment and underemployment, landlessness, vagaries of weather, the maize syndrome, female education, inadequate sanitation, health facilities and clean water and socio-political issues that affecting access to food [27].

The main policies of GoK for mitigating hunger are as follows [27]:

1. raising the productivity of smallholder farmers,
2. providing nutritional assistance to child-bearing women, children and other vulnerable groups, and
3. improving market functions to raise on-farm and off-farm activities.

The GoK decided to reduce poverty 23.3% in 2010 and 10% in 2015 and eliminate food poverty altogether by 2020.

5. Inflation

Kenya has experienced strong economic growth for over 1.5 decade. But high and volatile, inflation is a threat to good economic performance and has negative effects on many of the poor. Quick increases in inflation could reduce economic growth and worsen poverty levels. Although there is no real cause of the rise in inflation, it is estimated that large Government expenditures, expansionary monetary policy, global food price hike, inflation of oil price and negative domestic food supply shocks influence in inflation. Adverse weather conditions in recent years have further worsened the food situation in the region, causing a sharp increase in food prices ([2], [19]).

Kenya observed its inflation peak at 19.7% in November 2011, before dropping to 18.9% in December. This is a sharp reversal to previous years, when the authorities succeeded in bringing it down from 26% in 2008 to 4% in 2010. The central bank attributes the persistence of inflation to supply shocks, currency depreciation and emerging demand pressures driven by rapid growth in private sector credit [2].

Prices of maize in Kenya are among the highest in the eastern and southern African region. Only in Malawi has average maize prices exceeded those in Kenya [6]. High and volatile inflation is a threat to good economic performance and has negative effects on many of the poor. In 2011 inflation peaked at over 20% in Kenya. On the other hand oil prices increased about 20% in Kenya.

The global food price hike is also another main reason of increase of domestic food prices in Kenya [1]. Poor harvests due to natural calamities, such as, drought and flood, price hikes of electricity and fuels are also account of inflation.

Kenya is not only hit by the commodity-price hike and the financial crisis, but also post-election violence in 2008. As a result, real GDP growth dropped from over 7% in 2007 to below 1.5% in 2008 and inflation increased to over 30%. Inflation declined from 2009 until late 2010 and inflation then rose again. Due to inflation rapid depreciation of the KES; its value dropped from about 80 shilling per US dollar in early 2011 to over 100 shilling per US dollar in October 2011 [33].

5.1. Steps of GoK to Reduce Inflation

The Central Bank of Kenya (CBK) has attempted to constrain growth in credit to the private sector through large interest rate adjustments, in order to rein in inflation. In 2011 alone, the Central Bank has raised interest rates from 6.25% in May to 18% in December. The Central Bank also revised the cash reserve ratio by 50 basis points, from 4.75% to 5.25%. The effect of this monetary tightening on inflation may only appear after a cover, given the structural nature of liquidity and the threat still posed by rising food and energy costs, both of which make monetary policy less potent under conditions of inflation inertia. However, the current thinking is that supply shocks may soon subside, meaning that the effectiveness of interest rates in managing demand pressures may increase ([5,11]).

6. Food Gap

Kenya is the largest food and agricultural products importer in eastern Africa. As the production of maize is not keeping pace with the growth in national demand, imported wheat and rice are increasingly filling the residual food gap. For this reason, the share of wheat and rice in staple food expenditures are rising, leading to more diversified basket of staples over time. Only 3.5% of national consumption of maize is imported [4].

Kenya produced 3,027,000 tons of maize and imported 108,000 tons and exported 25,000 tons in 2007. Wheat is produced by large-scale producers (farms over 50 acres owners). In 2007, wheat import (60%) was more than product, it produced 360,000 tons of wheat and imported 612,000 tons and exported only 2,000 tons. Wheat import is increased to balance food deficit due to urbanization and population growth. Potatoes and plantains are being used as complement food of maize in Kenya. Production of potatoes and plantains were 855,000 and 602,000 tons respectively and there were no export or import of these two stuffs. Beans were produced 447,000 tons and imported 40,000 tons and exported only 3,000 tons.

Import of rice is growing rapidly in response to the rising gap between national staple food production and consumption requirements. Very little rice is produced in the country, but it is becoming a major staple in urban areas along the coast. In 2007, rice was produced 39,000 tons and imported 248,000 tons and exported only 1,000 tons [4].

In 2008 the price of fertilizer increased and fuel prices also increased and as well as post-election violence happened in Kenya. As a result the production of maize has decreased and the Government imported 135,000 tons from South Africa. Private traders informally imported 120,000 tons from Tanzania and Uganda despite official trade bans [28].

7. Foreign Aid

Foreign aid is one of the largest components of foreign capital flows to low-income countries. During the early post-independence period, Kenya was well favored by the donor community. In 1990, Kenya received more than $1 billion as development aid. Emergency food aid is provided during drought, floods, fires and internal displacement as a result of clashes. Since independence in 1963, Kenya has been dependent on foreign aid for capital investments such as roads, power, water supply, and telecommunications infrastructure.

In 2000, more than 5 million people were under famine relief programme and it took famine relief recipients 3 years to recover from the effects of drought. The government, NGOs and donors spend approximately $135 million on food assistance to distressed communities every year [27].

In 2004, the country received a total food aid of 202,659 metric tons, of which 174,239 metric tons of cereals (mainly coarse grains (59%), wheat (27%), fortified commodities (13%) and rice (1%)) and 28,420 metric tons of non-cereals (mainly oils and fats (65%), pulses (32%) and other non-cereal commodities (3%)) [37].

Donors, development agencies and Government are working to alleviate chronic or acute food insecurity. This project has new response choices that allow them to replace or supplement in-kind food aid with cash or vouchers. Food aid increase food in the recipients and they have to sell additional food if there is any to buy other essentials, such as, clothes, medicine, vegetables, fish, meat etc. On the other hand cash receivers spend money to buy food and other necessary household commodities. Both types of involvements can impact local prices, consumers and producers [18].

In January 2009, Kenya's food crisis deepened over allegations of corruption over the issuing of import licenses. On 16 January 2009, President Mwai Kibaki declared a state of emergency and launched an international appeal for $463 million to feed roughly 6 million people who were estimated to be food insecure. In January 2009, the World Food Programme pledged to feed 3.2 million people following the Government's declaration of a food crisis in the country [4].

Overseas Development Aid (ODA) sits at $34 per capita, just below the continent average of $36, which makes Kenya as vulnerable to decreases in aid flows as many other countries in the region.

8. Nutrition in Kenya

Malnutrition is a great public health problem in Kenya. In Kenya more than 10 million people are chronically food insecure. Malnutrition is the single greatest contributor to child mortality at 53%. Some elementary causes of malnutrition are inadequate food intake and disease while the underlying causes include poor maternal/child care practices, household food insecurity, inadequate health services. The main causes of malnutrition among women of reproductive age (WRA) are sub-optimal feeding practices especially during pregnancy, heavy workload, and low micronutrient intake [38]. Acute and chronic under-nutrition and micronutrient deficiencies primarily affect pregnant and lactating women and children under-5. Although the Kenya under-5 mortality rate has declined significantly between 2003 and 2009, it has increased again in 2013.

Kenya is in rank 33 at under-5 mortality rate (U5MR) in the world. U5MR in 2012 is 9.8% (male 7.8% and female 6.8%), infant mortality rate (under-1) 4.9%, and neonatal mortality rate 2.7%. Among children under-5 in Kenya, 35.5% stunted, 6.7% wasted, 4.7% overweight, and 5.6% of infants are born with low birth weight. At present in Kenya, an estimated 2.1 million children are stunted which is a serious national development concern as these children will never reach their full physical and mental potential. In Kenya the prevalence rates for wasting and underweight have declined over the past three decades, but the stunting rate has increased to 2.1 million children (35%). According to Government data, rates of stunting among children are much higher in Eastern Province (42%), compared with in Nairobi (29%). Vitamin A supplementation full coverage is 66% and iodized salt consumption is 67.6% in 2012 [35].

Recently Kenya is experiencing a rise in diet-related non-communicable diseases, such as cardiovascular, diabetes, cancers, kidney and liver complications that are attributed to the consumption of foods low in fibre and high in fats and sugars. Due to these diseases premature death to disabilities is increasing that reduce the quality of life. The proportion of women aged 15–49 who are overweight and obese has increased from 23% in 2003 to 25% in 2008–09 [32].

Micronutrient deficiencies are highly prevalent among children under-5 and women. According to 1999 national micronutrient survey in Kenya, the most common deficiencies include vitamin A deficiency (under-5, 84.4%), iron deficiency anemia (6–72 month olds 69% and pregnant women 55.1%), iodine deficiency disorders (36.8%) and zinc deficiency (mothers 52% and children under-5, 51%). Poor nutrition in infancy and early childhood increases the risk of infant child morbidity and mortality; diminished cognitive and physical development marked by poor performance in school and also impacts on productivity later in life [32].

8.1. Nutrition Programmes

GoK has developed the food and nutrition security policy to address nutrition security in the country, which places nutrition central to human development in the country. The GoK is harmonizing actions to improve nutrition with ministries and external organizations. National Nutrition Action Plan has approved by the Government in November 2012 and the GoK has committed to spend KSh 6 billion ($70 million) over the next five years (2013–2015) to scale up nutrition. The UK Department for International Development (DFID) has committed to assist KSh 2.29 billion ($26 million) to scale up of nutrition in the three counties of Turkana, Wajir and Mandera of Kenya. National Nutrition Action Plan defines cost-effective and high impact activities, and includes a strategic focus on increasing the demand and use of research to influence policy and practice.

International Medical Corps operates five emergency nutrition programmes in northern Kenya, where severe drought and increasing instability from neighboring Somalia have led to serious food shortages. The GoK has 11 strategic objectives that need to be addressed in order to realize the goal of promoting and improving nutrition status of all Kenyans as follows [32]:

1. To improve the nutritional status of women of reproductive age (15–49 years).
2. To improve the nutritional status of children under-5 years of age.
3. To reduce the prevalence of micronutrient deficiencies in the population.
4. To prevent deterioration of nutritional status and save lives of vulnerable groups in emergencies.
5. To improve access to quality curative nutrition services.
6. To improve prevention, management and control of diet related non-communicable diseases.
7. To improve nutrition in schools, public and private institutions.
8. To improve nutrition knowledge attitudes and practices among the population.
9. To strengthen the nutrition surveillance, monitoring and evaluation systems.
10. To enhance evidence-based decision-making through research.
11. To strengthen coordination and partnerships among the key nutrition actors and mobilize essential resources.

8.2. Breastfeeding Situation

Breastfeeding is the perfect way to provide the best food for a baby's first six months as breastfed infants are much less likely to die from diarrhoea, acute respiratory infections and other diseases. In Kenya early initial breastfeeding is 58.1% but exclusive breastfeeding (EBF) rate less than 6 months babies is 32% in 2008–2012. Introduction of solid, semi-solid or soft foods 6–8 months is 85.2% and breastfeeding at the age 2 is 53.6% in 2008–2012. About 60% of mothers in Kenya gave their babies additional food as well as water within two weeks of birth. This type of practice is observed more in pastoral community of Kenya, due to ignorance and ritual beliefs that the children will not love animals if they do not take the animal's milk as a substitute of mother's milk. This society strongly beliefs that "If the male child is introduced to his mother's milk first, he will become a useless boy and will not bring fortune for the family in future."

According to the Kenya Demographic and Health Survey (KDHS) 1998, 2003 and 2008–09 show that the median duration of breastfeeding has remained at 21 months. KDHS 2008/09 also indicates a significant improvement in EBF of children less than six months of age at 32% compared in 2012 to 11% in 2003 [32].

8.3. School Feeding

The School Feeding Programme is prevailing both urban and rural areas of Kenya where poverty-stricken. Based on the proportion of stunted children from poor families, it is estimated that 50% of children in pre-primary (600,000), 10% in primary (720,000), and 5% in secondary schools (43,000) will be availed school lunches. The standard diet provided in school meals comprises of a mixture of maize and beans at a ratio of 2:1 which is about 0.25 kg per student per day. Students attend in school for about 165 days (excluding weekends and school holidays) find this food. The annual cost of feeding 1.4 million children works out to $14 million per year [27].

9. Recommendations

For the development of the country in food and nutrition, and economy the GoK should give priority to the followings [27]:

1. Give priority in agriculture and rural investments by increasing productivity to lower per unit cost of production.

2. Increase capacity, particularly of professionals and technicians working on agriculture, nutrition and markets.

3. Improve access to financial services and credit in agriculture and rural development.

4. Reduce taxes on agriculture.

5. Encourage growth of agribusiness and improve regulatory services to ensure quality inputs and products.

6. Market development and orientation is necessary in favor of small producers.

7. Strengthen property rights to motivate private investments.

8. Provide incentives that promote sustainable natural resource management.

9. Empower women and increase budget for increase education and nutrition of the girls.

10. Build and improve rural infrastructure.

11. Create institute risk-reducing safety nets.

12. Uphold stable and fair macroeconomic and trade policies that level the playing field.

10. Concluding Remarks

In this study we have discussed aspects of food and nutrition situation of Kenya. Food insecurity is a major problem in Kenya. Every year a large amount of food is imported from the neighboring countries. Recently food aid is also decreasing in Kenya. So that GoK should stress on food security and nutrition to build a healthy nation. Breastfeeding practice for the first six months of baby's life and optimal complementary feeding with continued breastfeeding for at least two years and social consciousness must be created for the welfare of the future generation. Appropriate micronutrient supplements and food safety of nutrition commodities must be ensured to the children under-5. Sufficient nutritious food must be provided to the pregnant and lactating women. About 90% of the populations of the rural areas depend directly or indirectly on agriculture for their household income. Most of the land of this country is arid and semi-arid. As a result the agricultural products could not be increased due to various attempts taken by the Government. The GoK can try to invent new variety of crops which could be produced in arid and semi-arid land. Increase of irrigation facilities can enhance the food production in Kenya.

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