REPUBLIC OF KENYA

Towards Zero Hunger Strategic Review

Kenya | May 2018

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Foreword

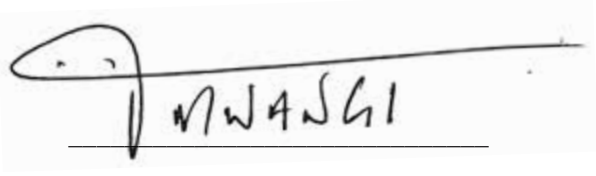
The Government has integrated **Food and Nutrition Security** as one of the "Big Four" commitments to the Kenyan people in the third Medium Term Plan 2018 to 2022. At the same time, the Government is fully committed to delivering the benefits of the Sustainable Development Goals (SDGs), especially to the poorest, through the implementation of Vision 2030. To this end, the Ministry of Agriculture and Irrigation is pleased to present **"Towards Zero Hunger Strategic Review"** as a milestone in assessing our national position of identifying the challenges and priorities for the achievement of SDG 2: "***End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture***" in Kenya, which is in line with **Food and Nutrition Security** of the "Big Four".

Led by the Ministry of Agriculture and Irrigation, the review has been undertaken in consultation with other ministries, county governments, development partners, the private sector, academia and civil society. Such a broad consultation reflects the multi-faceted nature of SDG 2, bringing together issues of poverty, agriculture, infrastructure, nutrition, climate and environment, biodiversity, trade regulations and tariffs amongst others. Taking a systematic approach, the report analyses where Kenya stands on each of the SDG 2 targets; identifies the national response priorities and gaps for achieving SDG 2; and finally provides conclusions and recommendations for all stakeholders to play their part in addressing the challenges in-order to achieve zero hunger in our country.

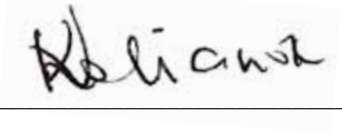
At the Ministry of Agriculture and Irrigation, we will play our part by increasing food production to meet the demands of an increasing population; look again at how food is produced, distributed, stored, processed and consumed; ensure that County Integrated Development Plans are aligned with national policies and priorities; form partnerships and coordinate institutions (especially at county level) in agriculture, food and nutrition; place more focus on counties in agricultural development; and implement strategies that will transform the agricultural sector.

In conclusion, we extend our appreciations to the Principal Secretary in the State Department for Crop Development for his leadership in chairing the Advisory Board meetings; Ministry of Health; State Department for Irrigation; State Department for Livestock; State Department for Agriculture Research; State Department for Social Protection, Pensions and Senior Citizens; State Department for Early Learning and Basic Education; various Government Agencies; Council of Governors Secretariat, development partners, various stakeholders, lead convener, and the research team. We also thank the World Food Programme for the assistance provided.

We, the Ministry of Agriculture and Irrigation and Council of Governors, therefore reaffirms our full commitment to creating a conducive environment for the realization of zero hunger in our country and hence urge all stakeholders including, but not limited to, other ministries, counties, departments, agencies, private sector, development partners and non-state actors to play their respective roles in ensuring that the recommendations in this review are fully and successfully implemented.



Mwangi Kiunjuri - Cabinet Secretary,
Ministry of Agriculture and Irrigation



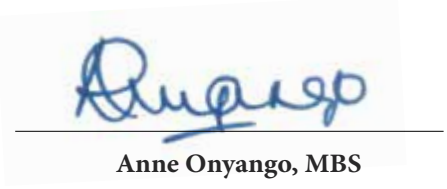
H. E. Josphat Nanok, Chairman
Council of Governors

Acknowledgements

Sustainable Development Goal 2 "***End Hunger, Achieve Food Security, Improved Nutrition, and Promote Sustainable Agriculture***" must be given priority for our country to achieve its overall sustainable development goal as envisioned in Vision 2030. The "*Towards Zero Hunger Strategic Review*" was launched in June 2017 to fast-track realization of SDG 2 by 2030. The review process was designed to be methodical, all-inclusive and consultative with the aim of understanding the existing food and nutrition context and challenges as well as providing a timely and meaningful contribution towards the development of Medium-Term Plan III (2018–2022) and the ongoing dialogue on Agenda 2030 for Sustainable Development. This review will, therefore be valuable to all stakeholders at the county, national, and international levels in supporting the Government in localizing and implementing SDG 2.

The Ministry of Agriculture and Irrigation wishes to acknowledge the technical experts whose efforts went towards the development of this review. Much appreciation goes to the Ministry of Agriculture and Irrigation for its leadership; the Advisory Board for their guidance and foresight; county governments and the Council of Governors Secretariat for their active participation and important input; private sector, non-state actors and development partners for their dependable, active and invaluable input; and the World Food Programme for its critical scrutiny of the review as well as providing the funding.

We are grateful to those who contributed in one way or another in the development of this review that may not have been mentioned here. Kindly take this acknowledgement as an expression of sincere appreciation.



Anne Onyango, MBS
Agriculture Secretary
State Department for Crop Development

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ASALs	Arid and Semi-Arid Lands
CIDPs	County Integrated Development Plans
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
KSh	Kenyan Shilling
MDGs	Millennium Development Goals
MoH	Ministry of Health
MTP	Medium-Term Plan
SDGs	Sustainable Development Goals
WFP	World Food Programme
WHO	World Health Organization

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Executive Summary

Executive Summary

Food insecurity, malnutrition and income inequality remain high in Kenya despite the considerable progress that was made towards achieving the Millennium Development Goals prior to 2015. The Government of Kenya continues to be committed to addressing these issues through the global Sustainable Development Goals (SDGs) defined in the 2030 Agenda for Sustainable Development and has committed to mainstreaming the SDGs in its third (2018–2022) Medium-Term Plan of Vision 2030, the national long-term development blueprint.

The Government recognizes that achieving the SDGs is a multi-stakeholder process and this review serves to involve stakeholders from multiple sectors and mandates to provide an analysis of the challenges and opportunities specific to achieving SDG 2 and to point towards multi-sectoral solutions.

This review provides an analysis and evaluation of the current status and trends of agriculture, food and nutrition security in Kenya within the context of the United Nations SDG 2 ***"End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture".*** Recommendations for achieving SDG 2 by 2030 are then made based on the analysis and on identified gaps in current government policy.

SDG 2 focuses on achieving **zero hunger** through six targets **i) ensuring access to safe, nutritious and sufficient food for all, ii) ending all forms of malnutrition, iii) doubling agricultural productivity and incomes of small-scale farmers, iv) ensuring sustainable food production systems and implementing resilient agricultural practices, v) maintaining genetic diversity and vi) increasing investment in agriculture; correcting and preventing trade restrictions; and ensuring proper functioning food commodity markets.**

In this review, agriculture, food security and nutrition are assessed within this framework. Methods of analysis comprise review of existing data on food security, agriculture and nutrition from government, academic and development partner sources and collation and assessment of current and previous government policy interventions in these areas. Gaps in these interventions are outlined and conclusions are then drawn from the analysis, resulting in a set of recommendations, both general to SDG 2 and for each specific target within SDG 2.

This review draws the following conclusions:

1. Kenya has the potential to increase food production and productivity to satisfy the current and future demand for food of the increasing population.

2. With appropriate interventions to support its growth and development, the agricultural sector can generate employment for a significant section of the population, boosting household incomes.

3. Kenya's social protection sector has the potential to ensure food security for the most vulnerable people if current progress in the sector's development is maintained.

4. Realization of potential advances in agriculture are being inhibited by limited implementation of regulatory and policy frameworks and this needs to be reversed.

5. Inadequate national infrastructure and food storage facilities means that while food may be available in high potential areas, distribution of food to food-deficit areas is insufficient, affecting communities' access to sufficient good quality food.

6. The productivity of the agricultural sector is limited by the low uptake and use of production-enhancing technologies, the high cost of agricultural inputs and insufficient links between research and farming that enable improved sustainability of agricultural production.

The review draws attention to numerous other challenges that negatively impact food security, nutrition and sustainable agriculture in Kenya, and these are outlined in the text.

The **key general recommendations** of this review are as follows:

Short - Term

1. **Investment in, water pans, small and large-scale irrigation projects through public-private partnerships, county governments and communities**. This should include supporting community and smallholder farmers with low-cost small-scale irrigation projects.
2. **Advocacy for high-level champions** at the national, county and grassroots levels who will use their platforms to call for zero hunger by 2030, through identification of decision makers and influencers.
3. **Harmonization of national priorities in agriculture, food and nutrition security with county integrated development plans** by augmenting the present resource allocation.
4. **Capacity strengthening of abilities of individuals, organizations and systems through training so that national and county governments** have capacity to implement all relevant programmes efficiently, effectively and transparently with effective monitoring and evaluation. **Evaluation of policy impact** and support counties in developing relevant systems and reporting capacities.
5. **Education of the youth on the benefits of farming and agriculture** to improve their perceptions of agriculture through, for example, school initiatives such as 4K clubs; emphasis of agriculture and nutrition in the school curriculum; and a review of national policies to create an enabling environment.
6. **Improvement in community engagement** and decision-making in agriculture, nutrition and food production by providing means of community feedback as well as strengthen community food and nutrition education that promote greater diversification of diets and healthy diets and lifestyles.
7. **Collection, analysis and dissemination reliable and timely data on all indicators for SDG 2**, disaggregated by gender and county through development of county-specific economic surveys as well as enhancing capacity and provision of necessary equipment and systems at the county level.

Medium - Term

1. **Guarantee that development priorities are fully resourced** through closer cooperation between the Ministry of Devolution and ASALs with the Ministry of the National Treasury and Planning, as well as and advocating for enough resources through sector hearings and Medium Term Expenditure Framework and Medium Term Plans.
2. **Enhancement of investments in ASALs** in particular in relation to irrigation structures such as dams and water pans; production of meat; access to animal health services; infrastructure; and social amenities.
3. **Treatment of malnutrition as a national development priority** and ensure the supply of safe and nutritious food is integrated into the relevant sectors' policies; and **enforcement of existing regulations on food fortification**.
4. **Establish food commodity markets** through sensitization of the appropriate National Assembly Committees as well as fast-tracking legislation in order to help limit food price volatility of commodities.

Long - Term

1. **Development of a national master plan for food and nutrition security** by building political awareness on the adverse effects of malnutrition on welfare and on development prospects; raising general level of knowledge and awareness of the importance of good nutrition; enacting supportive policies and laws; and taking swift and decisive action to achieve and maintain food and nutrition security.
2. **Address trade restrictions and distortions** through parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect.

Ongoing

1. **Collection, analysis and dissemination reliable and timely data on all indicators for SDG 2**, disaggregated by gender and county through development of county-specific economic surveys as well as enhancing capacity and provision of necessary equipment and systems at the county level.
2. **Encouragement of the private sector and non-state actors to respond to county and national government development policies and programmes in agriculture** to, for example, improve value addition, post-harvest technologies and market access for smallholders through better supply chain management, by creating an enabling environment such as supportive and inclusive regulatory changes to improve access to credit; land titling and leasehold reform; streamlining tax requirements; and facilitative law for public private partnerships.
3. **Improvement in coordination within and between national and county governments** by understanding the gaps and overlaps between ministries; and ensuring relevant ministries pro-actively seek coordination, both cross-sector as well as with private and other non-state actors, through newly established or enhanced forums.
4. **Implementation of existing policies and strategies in agriculture, food and nutrition security** by enacting legislation and by sensitizing members of the National Assembly and Senate on their significance, and improving advocacy and increasing pressure from the Council of Governors in this regard.
5. **Maintain genetic diversity of plants and animals** through soundly managed and diversified seed and plant banks at national, regional and international levels.

In addition, the review produced **specific recommendations** to consider, which are outlined in the text body. These recommendations pertain to each of the targets under SDG2 and should be undertaken in harmony with the general recommendations.

The approach to achieving SDG 2 needs to be multi-sectoral; strategies and actions must be crosscutting and, to be effectual, the recommendations of this report must be supported by both county and national governments. In addition, all stakeholders must participate in the development dialogue to achieve zero hunger in Kenya by 2030.

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Introduction

Part 1

Introduction

1.1 Background

Food and nutrition security is key to achieving both human and economic development. Article 43 (c) of the 2010 Constitution of Kenya assures Kenyans of the right to be free from hunger and to have adequate food of acceptable quality. Kenya's development blueprint, **Kenya Vision 2030**,[1] envisages a high quality of life within a clean and secure environment for all the country's citizens by 2030. Accordingly, the Government places great emphasis on ensuring that no person in Kenya will be deprived of the right to food and nutrition.

Until 2015, Kenya made considerable progress towards achieving some Millennium Development Goals (MDGs), in particular MDG 2 (achieve universal primary education), MDG 4 (reduce child mortality) and MDG 5 (improve maternal health). By contrast however, progress towards MDG 1 (eradicate extreme poverty and hunger) was limited. For example, the proportion of people living below the poverty line fluctuated considerably but only decreased overall from 43.4 percent in 1990 to 42 percent in 2016.[2]

In addition, in spite of rapid economic growth, food insecurity, under-nutrition and income inequality remain high: 26 percent of children under five are stunted, 4 percent are wasted and 11 percent are underweight.[3] While the proportion of under-weight children under five decreased from 22.3 percent[4] in 1990 to 11 percent in 2014,[5] the proportion of the population below minimum level of dietary energy consumption was still below the recommended level.

Moreover, significant differences persist between counties and regions, with food and nutrition insecurity worse than national averages in arid and semi-arid lands (ASALs),[6] urban slums and pockets of poverty. From 2010 to 2030, it is estimated that under-nutrition will cost Kenya US$38.3 billion in Gross Domestic Product (GDP) due to losses in workforce productivity.[7]

These issues can be addressed under the 2030 Agenda for Sustainable Development, which is defined by the global Sustainable Development Goals (SDGs) and their established indicators and targets, to be achieved by 2030. SDG 2 focuses specifically on **zero hunger** with the aim to "**end hunger, achieve food security and improved nutrition and promote sustainable agriculture**". The Government of Kenya has committed to mainstreaming the SDGs in the third (2018–2022) Medium-Term Plan of Kenya Vision 2030.

Agriculture (crops, livestock, fisheries and forestry) is the livelihood source for most of the rural population in Kenya. It is key to the economic growth of the nation and determines development opportunities and wealth creation as it provides food for the population, raw materials for the agro-based industries, and – through linkages with other sectors – contributes a substantial share of the country's foreign earnings. Accordingly, Kenya Vision 2030 and its second Medium-Term Plan (MTP II) 2013–2017 outlined agriculture as a key driver of an anticipated 10 percent annual economic growth.

The performance of agriculture and the overall economy are closely correlated (Figure 1). Sustained agricultural growth is thus an important pre-condition for attaining the targets of SDG 2 as well as facilitating the attainment

1 Kenya Vision 2030 popular version: *www.vision2030.go.ke*

2 *https://www.unicef.org/kenya/overview_4616.html*

3 Kenya Demographic and Health Survey, 2014

4 MDGs - Status Report for Kenya 2013

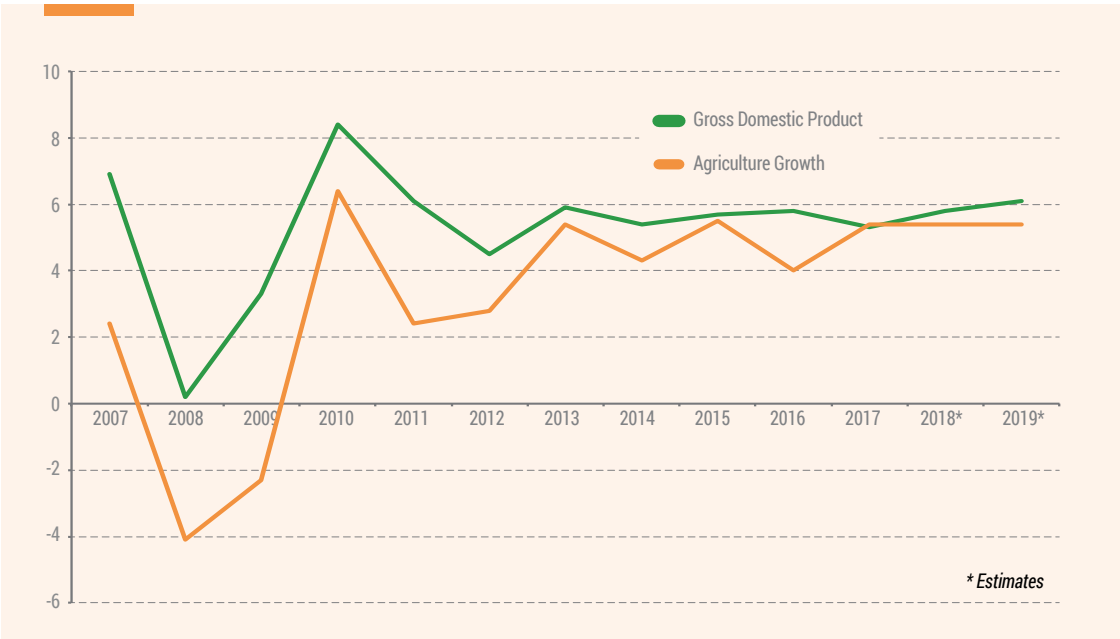
5 Kenya Demographic and Health Survey, 2014

6 Turkana, Baringo, West Pokot, Samburu, Isiolo, Marsabit, Mandera, Wajir, Garissa, Tana River, Narok, Kajiado, Lamu, Kilifi, Kwale, Taita Taveta, Kitui, Makueni, Meru, Tharaka, Nithi, Embu, Laikipia, Nyeri, Machakos, Kiambu, Elgeyo Marakwet, Nakuru, Migori, Homa Bay. *http://www.devolutionplanning.go.ke/wp-content/uploads/2015/04/DRAFT%20ASAL%20POLICY.pdf*

7 Kenya Fact Sheet: *www.feedthefuture.gov*

of other SDGs. Undeniably, agricultural growth contributes to the SDGs by improving peoples' access to more and better-quality food, raising farm incomes, creating employment on and off farm, and empowering poor and marginalized groups. It is a critical component for both rural development and wealth creation because the agricultural sector absorbs an increasing number of job seekers and generates income and livelihoods.

Figure 1 *Gross Domestic Product and Agriculture Growth*[8]



The 2010 Constitution devolved many functions to counties, including the promotion of agriculture, to address developmental challenges and improve on service delivery. Under the fourth schedule of the 2010 Constitution (Distribution of Functions Between the National Government and the County Governments), the national government is responsible for agricultural policies whereas the country governments are responsible for their implementation, such as in terms of crop and animal husbandry, livestock sale yards, county abattoirs, plant and animal disease control and management of fisheries. County governments can also develop their own agricultural polices if in line with those of the national government. This places emphasis on agriculture as a devolved function with respect to agricultural development.

In terms of improving access to nutrition, the devolution of responsibilities to counties has had varying outcomes. County leadership in nutrition has improved where counties have developed their own plans focusing on their local prioritized needs. However, while previously the national government allocated some funds to nutrition programmes, in many counties nutrition activities now have no specific budget allocation. A higher level of funding for nutrition-related activities exists in the ASALs due to partner support.[9]

While agriculture occupies a central role for combating hunger and food insecurity, it is important to note that food security is affected by and depends on progress in a number of other sectors too, including water, sanitation, hygiene, access to basic services, and not least, social protection.

8 **Source:** Kenya National Bureau of Statistics - Various Economic Surveys; 2017 - estimated data; 2018 and 2019 - forecast data

9 Personal communication with the Head of Nutrition and Dietetics Department, Ministry of Health; and with county nutrition coordinators in Homa Bay and Machakos counties.

1.2 Purpose of this Strategic Review

Kenya has developed several strategy documents that aim to improve the agricultural sector and other areas related to food and nutrition security (see Table 3).

The Government has developed the "***Roadmap to the SDGs – Kenya's Transition Strategy***", which describes how the Government plans to pursue the SDGs through advocacy and sensitization, resource mobilization, development of institutional frameworks, tracking and reporting on SDG indicators, and capacity building. The Ministry of Agriculture and Irrigation will lead government efforts to implement SDG 2. Furthermore, the Kenya National Bureau of Statistics (KNBS) together with stakeholders is identifying provisional indicators from 230 SDG indicators based on relevance, national priority and data availability.

Kenya Vision 2030 is implemented in successive five-year Medium-Term Plans (MTPs). All the Government's strategies must be incorporated into an MTP in order to ensure their implementation. MTP III (2018–2022) is currently being finalized. By mainstreaming them into MTP III, the SDGs have been integrated within national and county planning frameworks, localized and domesticated sector plans and the CIDPs of all 47 counties.

The Government recognizes that partners should be involved in the SDG process as they will contribute to translating goals into action. Recognized stakeholders include national and county governments, national and county assemblies, development partners (including UN agencies), research and academic institutions, and non-state actors (non-governmental organizations, faith based organizations, foundations, private sector and philanthropists).

The slow progress that has been made towards food and nutrition security warrants the adoption of multi-sectoral approaches by the Government at national and county levels, communities, and all other stakeholders to achieve SDG 2 targets.

This strategic review of the current status and trends in food, nutrition and agricultural in Kenya therefore serves to involve relevant stakeholders from multiple sectors, interests and institutional mandates to provide a multi-sectoral, in-depth analysis of the challenges and opportunities for achieving SDG2 targets and to point towards multi-sectoral solutions.

1.3 Objectives of this Strategic Review

The strategic review was carried out to involve all relevant, multi-sectoral stakeholders to arrive at a joint analysis and set of recommendations to achieve SDG 2 targets of increased food security, improved nutrition and sustainable agriculture. The process of developing this review both drew from and informed the MTP III with the aim of aligning MTP III and partner programmes during their respective development, ensuring that interventions aimed at achieving SDG 2 are harmonized for maximum impact.

Specifically, the objectives of this strategic review are to:

1. Conduct a comprehensive analysis of food security, nutrition, sustainable agriculture towards realizing the targets of SDG 2 targets in Kenya;
2. Establish the linkages between food security, improved nutrition and promotion of sustainable agriculture currently addressed through different sectors and entities, and propose potential synergies;
3. Identify policies, strategies, programmes, coordination mechanisms, and institutional capacities gaps and challenges in the national response to food and nutrition insecurity to inform and augment the government-led process of achieving the targets of SDG 2 within MTP III;
4. Provide recommendations in priority areas to accelerate progress towards the targets set in SDG 2;
5. Propose actionable areas where partners can better support Kenya to make significant progress toward zero hunger.

1.4 Strategic Review Methodology

The Towards Zero Hunger Strategic Review is a nationally owned exercise undertaken under the overall leadership of the Government of Kenya represented by the Ministry of Agriculture and Irrigation and specifically the Principal Secretary of the State Department of Agriculture.

All data reported are secondary data and no primary data were collected. Principal sources of data were the Kenya National Bureau of Statistics, Kenya democratic health surveys, various government ministries including the Ministry of Health and the Ministry of Agriculture and Irrigation, the State Department for Fisheries and United Nations reports.

The implementation of the strategic review was structured as follows.

A **lead convener** promoted the inclusive participation of senior government officials, international organizations, civil society, academia, key donors and others. In addition, the lead convener connected the work of the strategic review team to the Advisory Board and supported linkages between the review and other national processes.

An advisory board guided thematic and technical discussions, advising on alignment and validation of research findings. The board was chaired by the Principal Secretary of the State Department of Agriculture, and was composed of senior technical staff from relevant national and international institutions.

A **research/technical team** was drawn from independent research institutions and consultants mainly based in Kenya as well as technical members and focal points nominated by the Government and World Food Programme (WFP). The review was carried out through a consultative and inclusive process involving all relevant stakeholders, including a literature review, Advisory Board meetings, multi-stakeholder consultations.

1.5 Conceptual Framework

This review is structured in four parts. Part 1 provides the context and motivation rationale and objectives of the review. Part 2 provides an analysis of the current status and trends of food security, nutrition, agricultural with respect to each of targets of SDG 2 as well as the linkages between them. The targets for SDG 2 are shown in Figure 2 below.

Part 3 focuses on the national policies and strategies towards achieving food security, promoting sustainable agriculture and overcoming malnutrition as well as the institutional frameworks and resources. The fourth and final part of this review proposes a set of conclusions and recommendations for the consideration of each of the relevant stakeholders when they are developing their respective future programmes.


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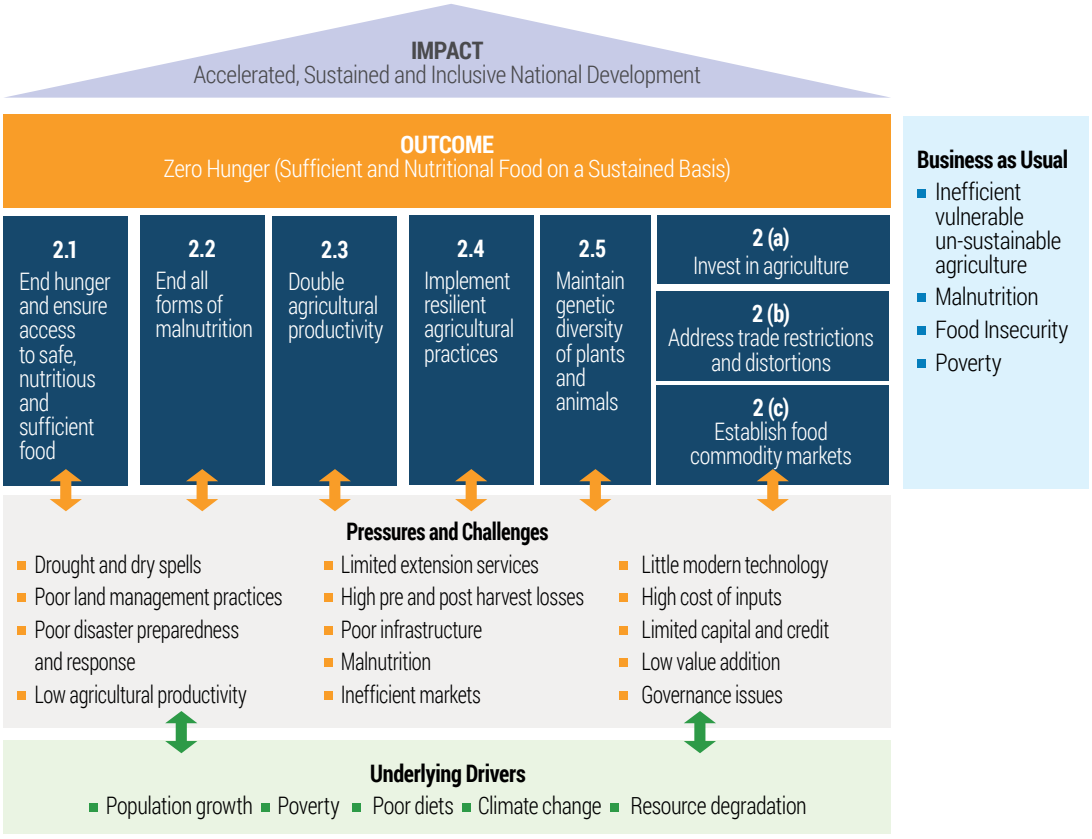
Figure 2 *Conceptual Framework for Sustainable Development Goal 2.*



The SDG 2 targets are the pillars of a comprehensive approach, which, in combination achieve zero hunger and contributes, amongst others to an accelerated, sustained and inclusive national development.

Each pertains to the national state of food security, nutrition and agriculture and is determined by a number of pressures and challenges. Each of these is, in turn, caused by underlying drivers – which are often worsened by self-reinforcing feedback mechanisms within the pressures and challenges.

If business as usual continues, the likelihood of overcoming these pressures, of improving the present state of food insecurity, malnutrition and unsustainable and inefficient agriculture – and of achieving SDG 2 – is low.

PHOTO:©WFP

Overview of Hunger, Food Security, Nutrition and Sustainable Agriculture

Part 2

Overview of Hunger, Food Security, Nutrition and Sustainable Agriculture

This section provides a detailed analysis of the current trends for food security, nutrition and sustainable agriculture under each SDG 2 target. Each section also looks into the factors affecting the current trends and points to inter-linkages between the different targets.

Target 2.1

End hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round

2.1.1 Definition of food security and links of target 2.1 with other sustainable development goals

Hunger is a condition in which a person, for a sustained period, is unable to eat sufficient food to meet basic nutritional needs. By contrast, **food security** exists "when all people, at all times, have physical, social and economic **access to sufficient, safe and nutritious food** that **meets their dietary needs** and food preferences for an active and healthy life".[10]

10 FAO 2012: The State of Food Insecurity in the World.

This target is also directly linked to SDG 1 (End poverty in all its forms everywhere) because globally the majority of the poor live in the rural areas[11] and nearly two-thirds of these people rely on agriculture as their main source of living. Moreover, they struggle to access productive resources and are highly vulnerable to climate shocks. Poverty reduction, including through better social protection programmes, will improve access to food.

2.1.2 Current status and trends of food insecurity in Kenya by region/ demography

The Kenya Constitution 2010 Article 43 (c) places legal obligations on the Government to overcome hunger and malnutrition and realize food security for all.

The Global Hunger Index for Kenya is 29.1,[12] which is classified as serious.[13] Food and nutrition insecurity is one of the major challenges currently affecting development in Kenya and is closely linked to the high level of poverty in the country.

One third of Kenyans live below the poverty line (US$1.90 per day).[14]

While 88 percent of Kenyan households have acceptable levels of food consumption[15], **about 2 percent of Kenyan households have**

11 *http://www.ophi.org.uk/wp-content/uploads/Poverty-in-Rural-and-Urban-Areas-Direct-Comparisons-using-the-Global-MPI-2014.pdf*

12 The 2017 Global Hunger Index (IFPRI) is calculated for 119 countries for which data are available for four indicators:
- the percentage of the population that is undernourished,
- the percentage of children under age five who suffer from wasting (low weight for height),
- the percentage of children under age five who suffer from stunting (low height for age), and
- the percentage of children who die before the age of five (child mortality).

13 *http://www.globalhungerindex.org/.* Below 10 low; 10-19.9 moderate; 20-34.9 serious; 35-49.9 alarming and over 50 extremely alarming

14 *http://povertydata.worldbank.org/poverty/country/KEN*

15 As indicated by a food consumption score that combines food diversity, food frequency (the number of days each food group is consumed) and the relative nutritional importance of different food groups. For more information see *http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp203207.pdf*

unacceptable levels of food consumption, which translates into a diet that consists chiefly of a staple, flavoured with green vegetables and oil. The remaining 10 percent of households have borderline levels of food consumption. Households headed by women are more likely to be food insecure than those headed by men – 16 percent and 10 percent, respectively.[16]

Most of the hunger prone areas are located in ASALs. Turkana stands out as being far more food insecure than any other county – almost one in five households (19 percent) have poor levels of food consumption and a further 24 percent of households have borderline levels of food consumption. The next most food insecure counties (by Food Consumption Score) are Samburu, Tana River, Baringo, West Pokot, Busia and Siaya.[17] The four arid counties (Marsabit, Mandera, Garissa and Wajir) that are relatively food secure by the food consumption score – because their high milk consumption inflates their score – have very low dietary diversity. These very poor counties, where the overwhelming majority of household heads have little or no education, are undoubtedly highly vulnerable to food insecurity because of their regular exposure to drought and food price inflation.[18]

Rural households in Kenya are more likely to be food insecure than urban households, (14 percent and 9 percent, respectively), and almost one in 10 rural households have low dietary diversity. However, food security is not just a rural problem, in Nairobi 19,000 households experience poor and 77,000 households experience borderline levels of food consumption.[19]

Rural households in non-arid areas only purchase about 30 per cent of the food they consume, while they produce about 70 percent themselves. In the arid counties, households purchase about 70 percent of their food requirements, and in urban households, this number rises to 98 percent of food requirements. **Purchasing power is therefore a defining factor for good food security in urban areas and in the ASALS, whereas in other rural areas, food security is more dependent on environmental/external factors.**

Levels of food insecurity escalate significantly during periods of drought, heavy rains, and/or floods.[20]

While food availability may be ensured through imports and markets, access to food is certainly compromised, in particular for the poor.

The 47 established county governments are improving accountability and public service delivery at sub-national levels, but many still lack capacity and resources to plan, budget and implement, including for nutrition and food security.

Maize is the main staple food crop, averaging over 80 percent of total cereals (rice, wheat, millet and sorghum) produced[21] and contributing significantly to food security by providing roughly a third of both calories and protein in the Kenyan diet.[22] Over the last three decades, per capita consumption of maize has increased by 3 percent per annum. It is grown by 98 percent of Kenya's 3.5 million smallholder farmers. Small- and medium-scale farmers produce about 75 percent of the crop, while large-scale farmers (farms over 25 acres) produce the rest.[23]

Consumers in urban and peri-urban areas are slowly shifting consumption patterns and changing their diets from traditional maize staples (posho) to other alternatives such as rice, potatoes and plantain (Figure 3).

16 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis:* Summary Report 2016.

17 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis:* Summary Report 2016.

18 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis:* Summary Report 2016.

19 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis:* Summary Report 2016.

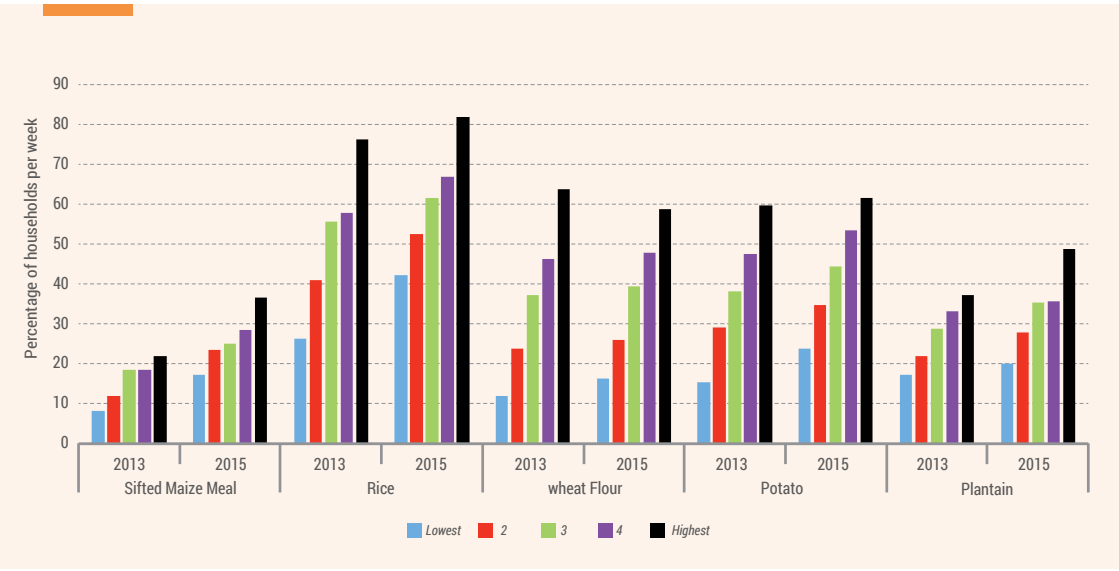
20 National Food Security and Nutrition Policy 2011

21 Food and Agricultural Organization of the United Nations, 2000: *Special Report on Crop and Food Supply Situation in Kenya*

22 De Groote and Kimenju. 2012.

23 FAO. 2013. *Analysis of price incentives for maize in Kenya 2005-2013.*

Figure 3 *Changes in consumption patterns by income quintile, 2013–2015*[24]



School meals are provided to approximately 2 million children. This is a strong incentive for enrolment and attendance and increases intake and awareness of adequate, locally available and nutritious food among school children. They are also an important safety net for vulnerable children.

In Kenya 400,000 refugees live in camps in Garissa (Dadaab camps) and Turkana (Kakuma camps and Kalobeyei settlement) counties. While the specific vulnerability of households varies, overall **the refugee population is highly food-insecure**[25] because legal constraints severely restrict their access to livelihoods opportunities that prevent them from becoming self-reliant. Refugees are therefore highly dependent on international assistance.

2.1.3 Factors affecting food security in Kenya

Poverty. Food-insecure households are typically poor, rural and dependent on daily agricultural labour; they have fewer livestock, less agricultural land and a higher dependency ratio. The poorer the household, the higher the use of severe and frequent food-related strategies to cope with shocks: food security prevalence decreases with decreasing wealth and vice versa.[26] **The eight counties in Kenya that have a significantly higher proportion of households with unacceptable food consumption than the national average, are amongst the poorest**.[27]

High vulnerability to climate change and increasing weather-related shocks. Trends show that large-scale droughts occur roughly every five years, increasing the number of acutely food-insecure people in the arid and semi-arid lands, most recently up to 3.6 million in 2017.

Inadequate national food reserves. Food reserve systems managed by the National Cereals and Produce Board are unreliable due to inadequate funds to purchase sufficient food stocks. While food is abundant in high potential areas, distribution of food to deficit and drought parts of the country has been a challenge. This trend can partially be attributed to inefficiencies

24 Onyango, Kevin, Tim Njagi, Nthenya Kinyumu, and Lilian Kirimi. 2016. "Changing Consumption Patterns among Rural & Urban Households in Kenya." (2):3-6.

25 Helen Guyatt and Flavia Della Rosa. 2015. *Refugee Vulnerability Study, Kakuma*, Kenya, November 2015.

26 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis*: Summary Report 2016.

27 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis*: Summary Report 2016.

along the supply chain and poor distribution mechanisms. There is inadequate preparedness in ensuring sufficient quantities of strategic grain and feed reserves.

Land inheritance practices. According to the findings of the survey of national food security in Kenya,[28] **patrilineal land inheritance cultural practices are a key variable affecting food security**. Women are the principal food providers responsible for ensuring food security for their households and they perform most of the agricultural activities. Patrilineal land inheritance cultural practices deprive women of the right to own and control property, including land. This contributes to food insecurity, as the women, as the food producers, cannot make strategic, food security-related decisions, such as what to grow where, and cannot access loans to purchase farm inputs. The research found that families were most food secure where women have the power to make decisions as household heads, particularly among agricultural communities (e.g. in Kirinyaga).

Moreover, land is being increasingly fragmented through land inheritance into increasingly smaller parcels, making agricultural land uneconomical among farming communities.

Declining yields. **Yields of several staple crops have declined because of land degradation**, limited use of inputs and services due to their high cost, over-dependence on rain-fed agriculture and high post-harvest losses (20–30 percent for cereals and 40-60 percent in fruits and vegetables).[29]

Over-dependence on rain-fed agriculture. **Ninety-five percent of crops in Kenya are rain fed, leaving farmers highly exposed to droughts.** Seasons have become far less predictable, with poor distribution of rainfall over space and time, thereby disrupting cropping and exacerbating soil erosion. Pastoralists face severe water scarcity for fodder and water for their livestock during the long dry spells, which often leads to resource-based conflicts.

Inaccessibility of markets. **Rural households**, and in particular households **in the arid counties** of Garissa, Isiolo, Mandera, Marsabit, Samburu, Turkana and Wajir **are highly dependent on markets**, where they purchase up to 70 percent of their food consumption needs. Most of the markets in these areas are weakly integrated both amongst themselves and with the main supply markets because of poor infrastructure and low population density. In the arid lands, food availability in markets is seasonal, depending on production cycles and climatic conditions in the food producing areas of the country, as well as transport conditions. While it can take up to four days to reach remote markets during the dry season, in the rainy season, routes are sometimes impassable, increasing supply times, reducing availability and pushing up prices.[30]

Increasing population pressure coupled with erratic rainfall in arid areas. Most of the hunger-prone areas in Kenya are located **in arid and semi-arid areas**. A key driver of food insecurity in these areas is erratic rainfall patterns characterized by prolonged dry spells that reduce vegetative ground cover followed by torrential rains. **Increasing population pressure has increased livestock density in these areas**, removing stabilizing vegetation and allowing the fertile top soil to be washed away under heavy rains. Loss of topsoil results in a concomitant reduction in land productivity (of both pasture and crops), further pushing communities into food insecurity.

Inadequate food safety regulations. Several negative events affecting food safety have occurred in the recent past in Kenya. These include outbreaks of cholera, aflatoxin poisoning (aflatoxicosis) and the existence of heavy pesticide residues on fruits and vegetables, which have led to loss of lives. Findings from cited studies and monitoring exercises in three arid and semi-arid counties show that there is need to

28 African Women Studies Centre/ Kenya National Bureau of Statistics, 2014: *National Food Security Baseline Survey*. A total of 4,200 household heads, from the 20 counties, were interviewed on their household food security status.

29 ICIPE. 2013. Addressing food losses: Status and way forward for post-harvest research and innovations in Kenya, Policy brief 5/13.

30 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis*: Summary Report 2016.

put measures in place to ensure early detection and control toxins and other hazardous elements in food supplied to education institutions. In addition, monitoring exercises have found the commodities in markets were of low grain quality when compared to national standard specifications. There is therefore an urgent need to provide **comprehensive national guidelines to ensure that consumed food that is safe and of good quality**.

Presence of significant numbers of refugees. Kenya is host to 400,000 refugees, located in two highly food-insecure counties (Garissa and Turkana). **Refugees are highly food insecure and are completely dependent on external support for their food requirements**. A new model designed to integrate refugees and the host community is being developed in Kalobeyei settlement in Turkana County to integrate (socially and economically) refugees with host communities with the goal of increasing their self-reliance by increasing livelihood opportunities for both.

Low livestock ownership in some regions. Livestock ownership is correlated with greater food security, and households with acceptable food security own on average 2.3 tropical livestock units[31] and those with unacceptable food security own 1.4 tropical livestock units. Similarly, households with a high coping strategy index own 1.8 tropical livestock units, versus 2.5 for those with a low coping strategy index.[32] Despite high poverty and low education levels, the pastoralist counties of Wajir, Mandera, Garissa and Marsabit are relatively food secure because of their high consumption of animal products, especially milk. However, these counties show low dietary diversity. Food security would quickly drop in the likely event of a drought that would make their animals less productive (or kill them) and in the event of increases in food prices.

31 Tropical livestock units quantify different livestock types in a standardized manner: 1 TLU = 1 head of cattle, 0.7 of a camel, or 10 sheep or goats.

32 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis*: Summary Report 2016.

▶ Target 2.2

End all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons

2.2.1 Definition of malnutrition and links of target 2.2 with other sustainable development goals

Adequate nutrition is essential for an active and healthy life. Malnutrition encompasses both **over-** and **under-nutrition**. Under-nutrition is defined as having insufficient energy or nutrients to live a physically active life that allows for optimal health. Overall, under-nutrition represents the single largest killer of children under five globally, contributing to about 45 percent of total deaths in children of this age group.[33]

Stunting (low height-for-age) is caused by long-term insufficient nutrient intake and frequent infections. Stunting generally occurs before the age of two, and effects are largely irreversible. These include delayed motor development, impaired cognitive function and poor school performance.

Stunting in early life, particularly in the first 1,000 days from conception until the age of two, results in impaired growth and has adverse functional consequences on the child. Some of those consequences include poor cognition and educational performance, low adult potential to earn, lost productivity and, when accompanied by excessive weight gain later in childhood, an increased risk of nutrition-related chronic diseases in adult life.

33 *https://data.unicef.org/topic/nutrition/malnutrition/*

Wasting (low weight-for-height) is a strong predictor of mortality among children under five. It is usually the result of **acute significant food shortage and/or disease**.

Overweight is an increasingly important issue all over the world: 20 developing countries have rates above 5 percent. Childhood under-nutrition and overweight co-exist in many countries, leading to a double burden of malnutrition.

The causes of malnutrition cannot only be addressed by actions under SDG 2 target 2.2 but also require action under other targets that provide complementary support. Malnutrition is directly linked with poverty (addressed in **SDG 1**), as poverty limits access to adequate food and also has direct effects on hygiene, meal preparation, and the micronutrient context. Good nutrition influences health, which directly relates to **SDG 3** (ensure healthy lives and promote well-being for all at all ages). In addition, target 2.2 relates to **SDG 4** (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) because better educated people may be better placed to improve their livelihoods, including through improved nutrition. It has also been shown that higher levels of education in mothers is directly correlates to better nutrition and health in their children in Nairobi[34] and elsewhere.[35] Schools can provide an excellent platform for children to access good food and develop healthy dietary (and sanitation) habits; and school meals programmes can improve access to and participation in education. This target also relates to **SDG 6** (ensure availability and sustainable management of water and sanitation for all) because water and sanitation are of paramount importance to better health and nutrition.

2.2.2 Current status and trends of malnutrition in Kenya

The National Food and Nutrition Security Policy Implementation Framework, 2017–2022, (under development) establishes national targets[36] to end malnutrition in the country in line with sustainable development goals and the international targets set out for 2025 by the World Health Assembly in 2015. These targets are to be included in the MTP III 2018–2022 currently under development.

Table 1 shows key national targets for malnutrition and compares them with the global World Health Assembly 2025 targets. Overall**, Kenya has made significant improvements towards ending malnutrition and is the only country on course to meet World Health Assembly targets**, according to the latest Global Nutrition Report.[37]

Consequences of malnutrition are as varied as its causes, ranging from reduced physical and mental development to increased morbidity and reduced life expectancy. In this context, it is important to note that Kenya is experiencing an epidemiological transition in the burden of **non-communicable diseases**, in particular cancers and diabetes (MoH, 2015). Non-communicable diseases are a major public health concern with significant social and economic implications in terms of health care-needs, lost productivity and premature death. The increase in these diseases is fuelled by unhealthy lifestyles, including unhealthy dietary habits, reduced levels of physical activity and consumption of alcohol. Nutrition thus plays a central role in the prevention of non-communicable diseases (MoH, 2015).

In terms of **dietary intake**, WHO recommends at least five servings of fruits and vegetables per day. However, the average Kenyan consumes fruits 2.5 days a week and vegetables 5 days a week. **Almost all Kenyans (94 percent) consume less than the recommended servings of fruits**

34 *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3444953/*

35 *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4177694/*

36 Counties have yet to set their targets.

37 *https://www.globalnutritionreport.org/files/2017/11/Report_2017.pdf*

and vegetables per week. Nearly a quarter of Kenyans (23.2 percent) often add salt to their food before eating or when eating and a further 4.3 percent always or often consume processed food high in salt. About 28 percent always add sugar to beverages, and 6.5 percent of Kenyans do not engage in the recommended amount of physical activity.[38]

38 African Population and Health Research Centre. 2016. *Kenya STEPwise Survey for Non-Communicable Diseases Risk Factors 2015 Report. http://aphrc.org/post/publications/kenya-stepwise-survey-non-communicable-diseases-risk-factors-2015-report*


PHOTO:©UNICEF

Table 1 *Current status and national and Global World Health Assembly targets for malnutrition rates in Kenya*

Indicator	2014 Status	National Food and Nutrition Security 2025 targets	Global World Health Assembly targets	Comments
	(Percent)			
Stunting	26*	15	21	National target is more ambitious than WHA target as Kenya has already made significant progress in this indicator
Wasting	4*	< 5	< 5	National rate is currently below both national and WHA targets
Underweight	4.1*	< 5	< 5	National rate is currently below both national and WHA targets
Prevalence of anaemia among pregnant women	36**	20	50 reduction from 36	Current rate is higher than national target
Vitamin A deficiency among children < 5	9.2**	4	None	Current rate is higher than national target

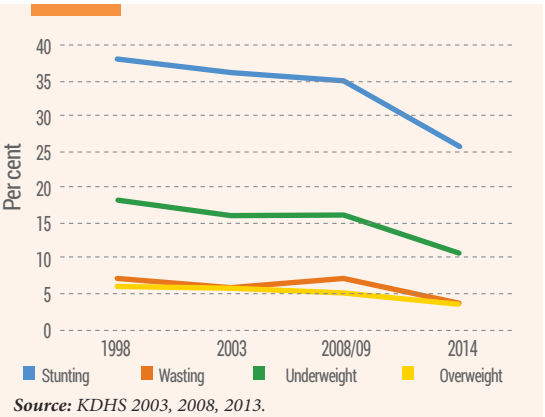
** Kenya Demographic Health Survey, 2014*

*** Kenya National Micronutrient Survey (2011), Ministry of Health*

2.2.3 Status of Malnutrition in Children under Five

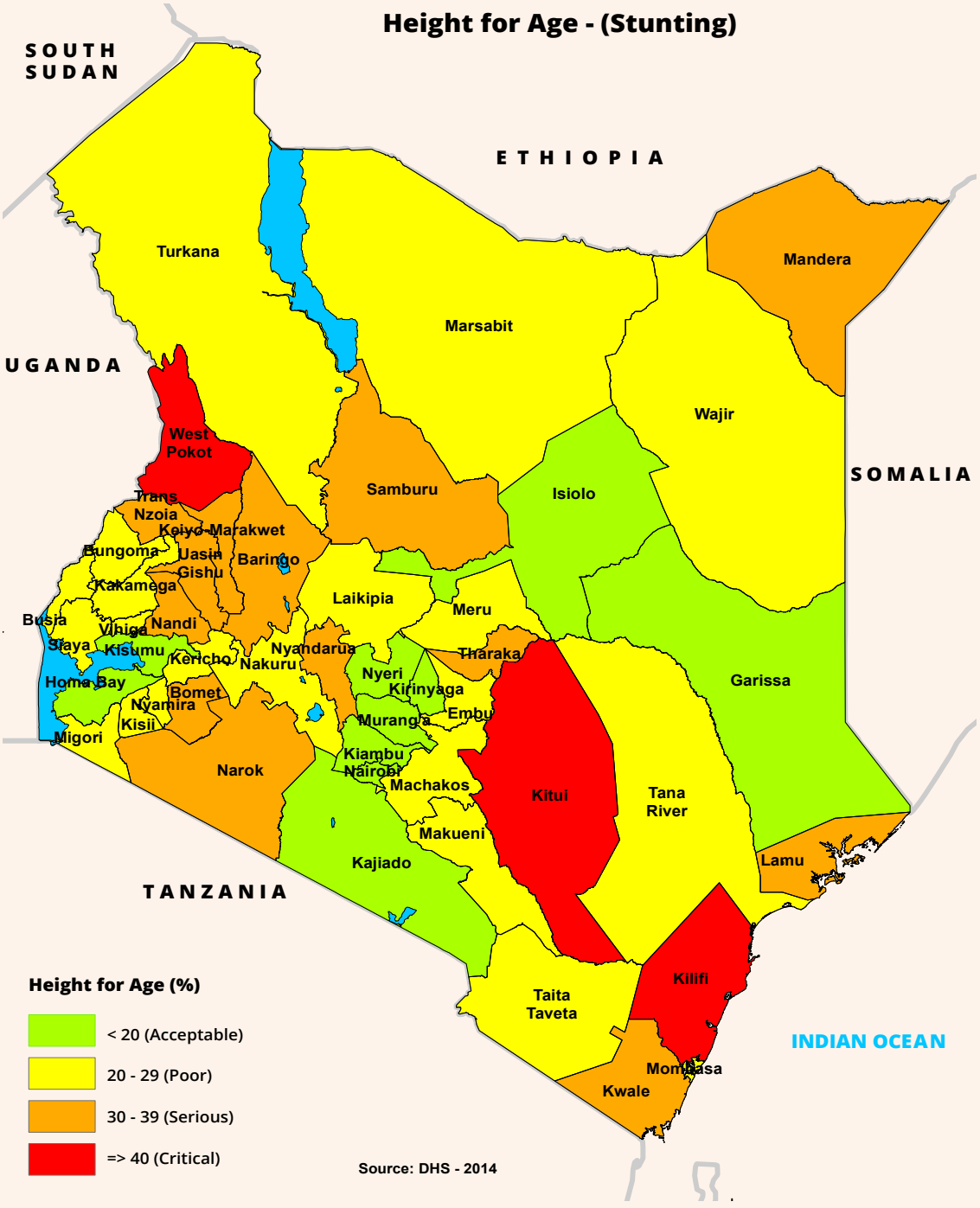
Stunting and wasting. The nutritional status of children under five with respect to stunting, wasting, underweight overweight has improved in Kenya in the last two decades, as shown in Figure 4. Despite these improvements, however, malnutrition remains a challenge, as can be seen from Figure 5.

Figure 4 *Trends of the nutritional status of children under five: 1998–2014*



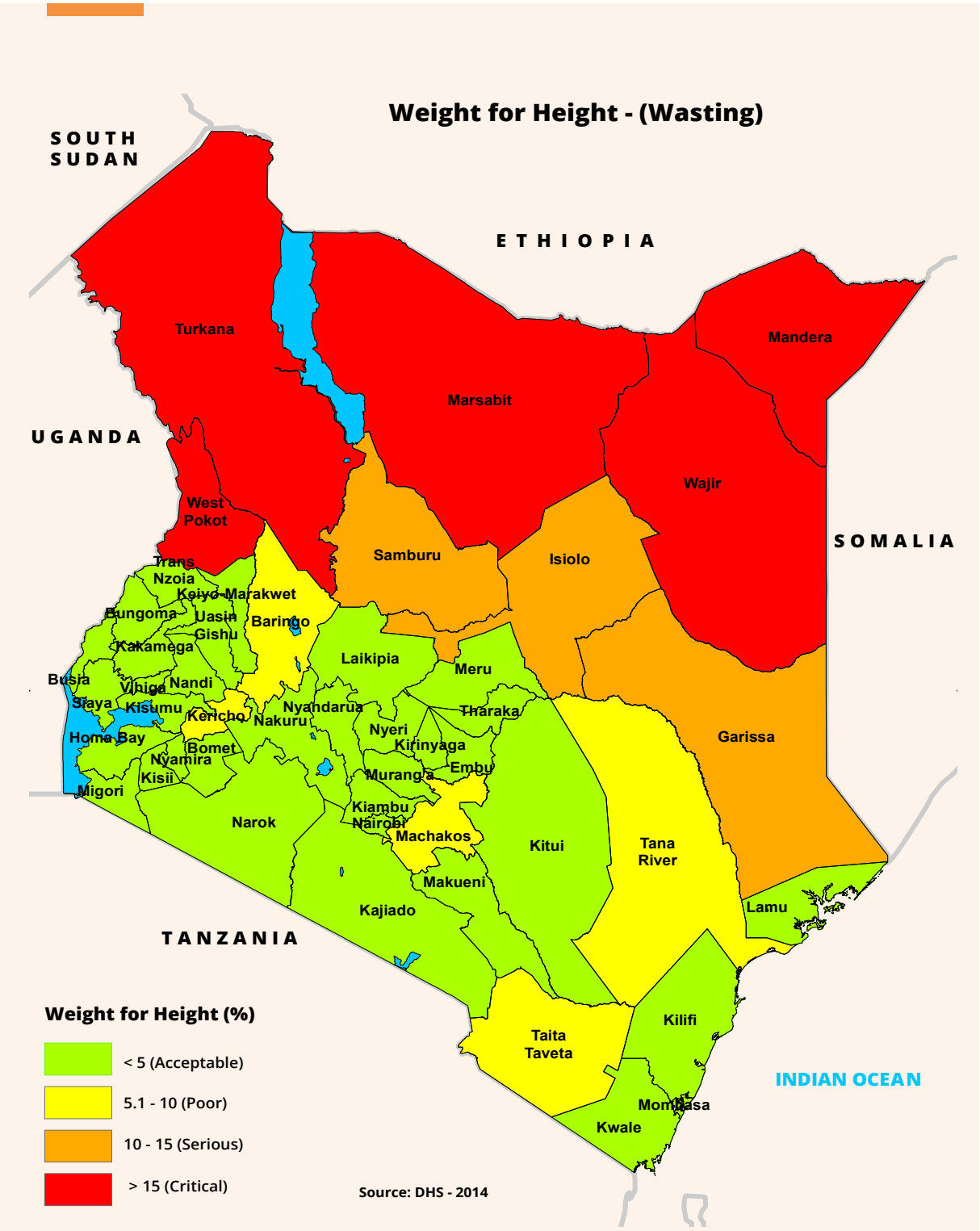
Source: *KDHS 2003, 2008, 2013.*

Figure 5 *Distribution of stunting and wasting of children under five by region*



Source: *World Food Programme. 2016. Comprehensive Food Security and Vulnerability Analysis*

Figure 5 *Distribution of stunting and wasting of children under five by region*



Source: *World Food Programme. 2016. Comprehensive Food Security and Vulnerability Analysis*

Figure 5 also shows that the prevalence of stunting and wasting in children under five varies considerably by region, and that stunting and wasting are not correlated. For example, in arid and semi-arid counties, wasting rates are high, while stunting rates are relatively low, reflecting their different causes. As such, they must be addressed by different, context-specific strategies and interventions.

Stunting in children under five is higher in rural areas (29 percent) than in urban areas (20 percent). The highest rate is in West Pokot County (45.9 percent) and Kitui County (45.8 percent), whereas the lowest rates are recorded in Kiambu and Nyeri and counties at 15.7 and 15.1 percent, respectively.[39]

Seven percent of children aged 6 to 11 months old suffer from wasting in Kenya. Turkana County has the highest prevalence of wasting at 22 percent followed by Mandera at 14.8 percent and Wajir County at 14.2 percent. The lowest rates of wasting are in Siaya and Kisumu counties at 0.2 percent and 0.8 percent, respectively (KDHS, 2014). In arid and semi-arid counties, seasonal escalation of wasting rates up to 20 and 30 percent were observed during the 2011 and 2017 droughts.[40] It may be that households cope with decreased access to food by reducing the number, quantity and/or quality of meals. However, **at present reliable data are lacking that would help fully understand the dynamics that lead to such pronounced wasting or to high chronic malnutrition rates.**

Overweight and obesity. Country-wide, the prevalence of overweight and obesity among children under five has decreased slightly from 6 percent in 2003 to 4 percent in 2014 (KDHS, 2014). The prevalence of overweight and obesity is highest in Nairobi (5.3 percent) and lowest (0.7 percent) in Wajir County. **The prevalence of overweight and obesity is higher in urban areas than rural** due to technological advancement and better economic status, which enables increased access to and consumption of energy-dense foods coupled with sedentary lifestyles.

39 Kenya Demographic and Health Survey, 2014.

40 Kenya Food and Nutrition Security Seasonal Assessments (2011 and 2017).

2.2.4 *Factors Affecting Malnutrition in Children under Five*

Inadequate food and nutrient intake, high presence of disease and limited access to health services. Immediate causes of malnutrition in Kenya, particularly for children under five, are inadequate food intake (in terms of quantity and quality) and presence of diseases such as diarrhoea, acute respiratory infections, measles, malaria and Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome (HIV/AIDS). In addition, a host of poverty-related underlying factors contribute to malnutrition, including food insecurity, poor water and sanitation, as well as limited access to health services (as illustrated in Figure 6). Some of these are explored in more detail in the following paragraphs.

Poor food quality, including micronutrient deficiencies. **In 2011, 82 percent of pre-school children were suffering from zinc deficiency, 26 percent were anaemic and 22 percent suffered from iron deficiency** (see Figure 7). Micronutrients are minerals and vitamins that play a crucial role in human nutrition. **Micronutrient deficiencies** result in poor physical and mental development, low immunity and even death. The effects of micronutrient deficiencies include stunted growth, cognitive delays, weakened immunity and disease. **Zinc** deficiency impairs immune function and is associated with an increased risk of gastrointestinal infections. It is also a contributing factor in child deaths due to diarrhoea. Consuming a diverse range of nutrient-dense foods alongside breastfeeding is the ideal way for young children to get essential micronutrients in their diets.

Food safety plays an important role, as large amounts of food are produced, stored and traded in informal settings with limited capacity for ensuring that food is safe to consume. This, matched by **limited consumer awareness of food safety**, leads to disease and unhealthy lifestyles.

A growing body of research highlights an association between aflatoxin exposure and child linear growth (IFPRI, 2015; Levy, 2013). There are multiple risk factors for aflatoxin contamination of foods; inadequate drying and storage of food under damp conditions are primary factors that lead to aflatoxin production and grain contamination. Drought conditions and insect invasion can weaken crops and make them susceptible to contamination. Animals fed on contaminated grains can pass aflatoxin transformation products into milk and meat. The hypothesized direct pathway for aflatoxin contamination of humans is a biological one – aflatoxin consumption may increase infections by suppressing the immune system or reducing nutrient absorption by changing a person's metabolism. However, given the lack of research, it is not clear what the precise role of aflatoxins is versus other correlated factors such as household socioeconomic status, child illness and dietary intake on malnutrition. A study to determine whether aflatoxin exposure could be a causal determinant of stunting is currently being conducted by IFPRI in Meru and Tharaka-Nithi Counties where aflatoxin levels are high.

Poor care resources and practices. The first two years of life are a critical window for ensuring optimal child growth and development. The consequences of nutritional deficiencies during this period may be difficult to reverse (Grantham et al., 2007). The World Health Organization recommends initiation of breastfeeding within the first hour of birth, exclusive breastfeeding for six months, introduction of appropriate complementary feeding at six months, and continued breastfeeding for two years or longer (WHO, 2010).

In Kenya, **only 62 percent of infants are initiated to breastfeeding** within the first hour of birth, with this rate varying between 81 percent in the north-east and 48 percent in the central region. However, while disparities between regions persist, the rate of exclusive breastfeeding in Kenya has doubled from 31.9 percent in 2008–2009 to 61.4 percent in 2014 (KDHS, 2014).

In addition, complementary feeding practices remain sub-optimal. The minimum dietary diversity[41] among children 6 to 23 months old is 41 percent, with the lowest rate in North Eastern Province (7 percent) and the highest in Nairobi (74.1 percent). Nationally **only 51 percent of children aged 6 to 23 months receive meals at the minimum meal frequency and only 22 percent attain the minimum acceptable diet** (KDHS, 2014).[42]

The Kenya Demographic Health Survey (2014) only provides national rates of feeding practices of infants and young children, without disaggregation by region, county or residence (rural versus urban). **Regional data on infant and feeding practices and factors influencing these practices are also scarce.**

In Turkana County, a Ministry of Health (2014) survey on infant and young child feeding practices reported an exclusive breastfeeding rate of 31.6 percent. In this survey, 69.8 percent of infants were initiated to breastfeeding within the first hour of birth, 9.5 percent achieved a minimum dietary diversity, 45.3 percent attained minimum meal frequency and only 6.8 percent consumed a minimum acceptable diet.

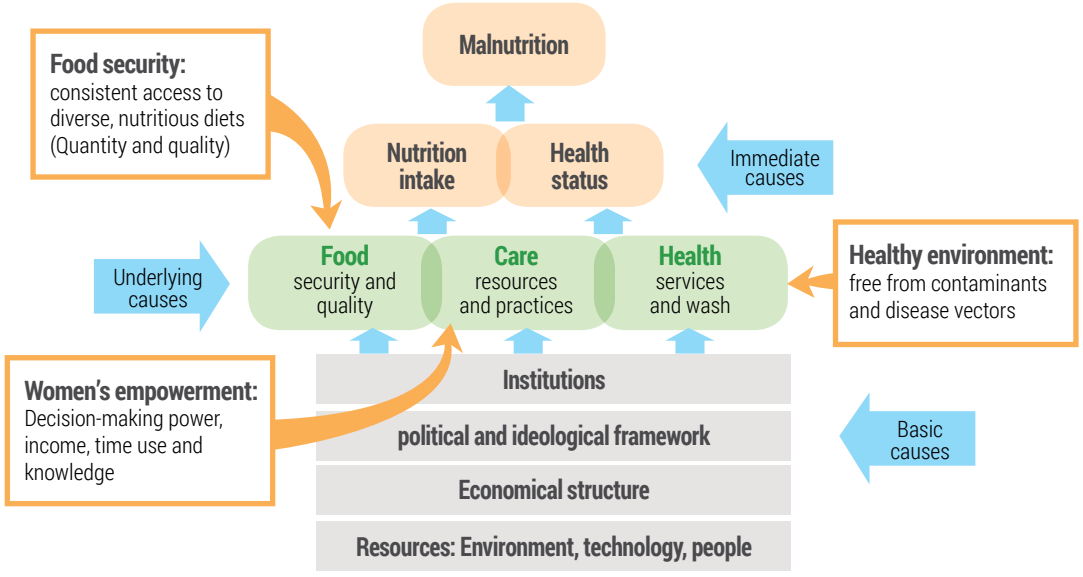
A study conducted recently in Homa Bay County reported an exclusive breastfeeding rate of children aged up to six months of 38.4 percent (MoH, 2016). The study also showed that 67 percent of infants were initiated to breastfeeding within the first hour of birth; 32.6 percent achieved a minimum dietary diversity; 61.2 percent achieved a minimum meal frequency and 22.5 percent consumed a minimum acceptable diet.

The findings of these two surveys showed that maternal knowledge on breastfeeding practices was high. The main barriers to optimal breastfeeding practices were socio-cultural issues compounded by wrong messages given by traditional birth attendants. In Homa Bay, maternal **knowledge on appropriate complementary feeding practices was low** and this was not given much attention in the messages mothers received at the health facilities (MoH, 2016). **In Turkana, unavailability of foods was reported to be a major factor hindering optimal complementary feeding practices.**

41 **Minimum dietary diversity** (%) (WHO). Proportion of children 6-23.9 months of age who receive foods from four or more food groups. **Dietary diversity** refers to the child receiving 4+ of the following food groups: grains, roots and tubers; legumes and nuts; dairy products (milk, yogurt, cheese); flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin A-rich fruits and vegetables; other fruits and vegetables.

42 Minimum acceptable diet (WHO) measures the proportion of children who had at least the minimum meal frequency and the minimum dietary diversity during the previous day.

Figure 6 *Conceptual framework on the determinants of malnutrition (adapted from UNICEF 1990)*

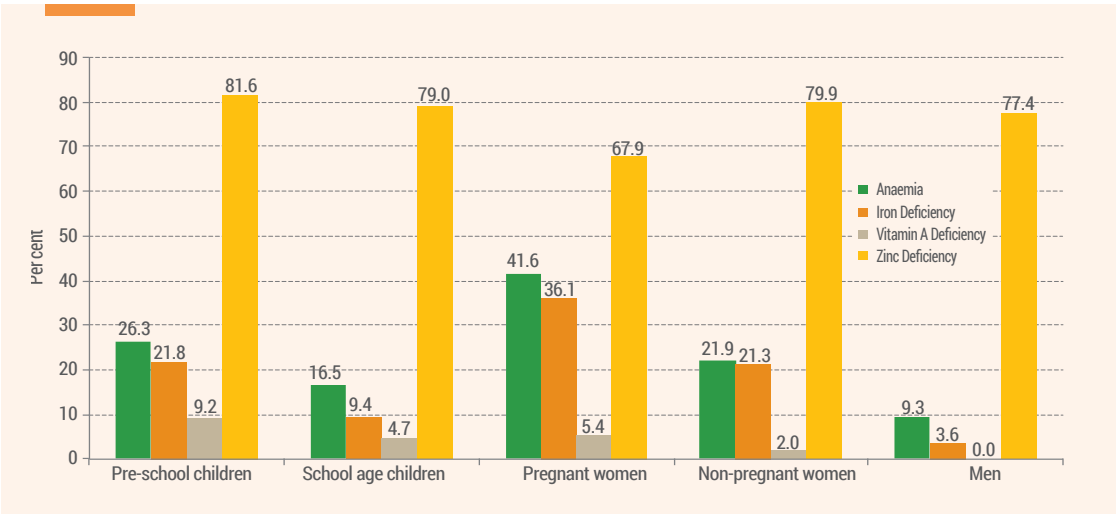


2.2.5 *Nutrition of Over Fives and Driving Factors*

National status of micronutrient intake. The micronutrient status of the population in Kenya improved considerably between 1999 and 2011 (IFPRI, 2014). Vitamin A deficiency is below 10 percent for all population groups (MoH, 2011). This improved micronutrient status may be due to improved interventions such as vitamin A supplementation and fortification of flours, sugar, and oils.

However, **micronutrient deficiencies continue to be high**. Zinc deficiency affects the entire population and as Figure 7 shows, it is highest (81.6 percent) among pre-school children, followed by non-pregnant women (79.9 percent) and school-age children (79 percent). Anaemia and iron deficiency are most widespread among pregnant women (41.6 and 36.1 percent, respectively) and pre-school children (26.3 and 21.8 percent, respectively).

Figure 7 *Prevalence of micronutrient deficiencies among various population groups in Kenya: 2011*



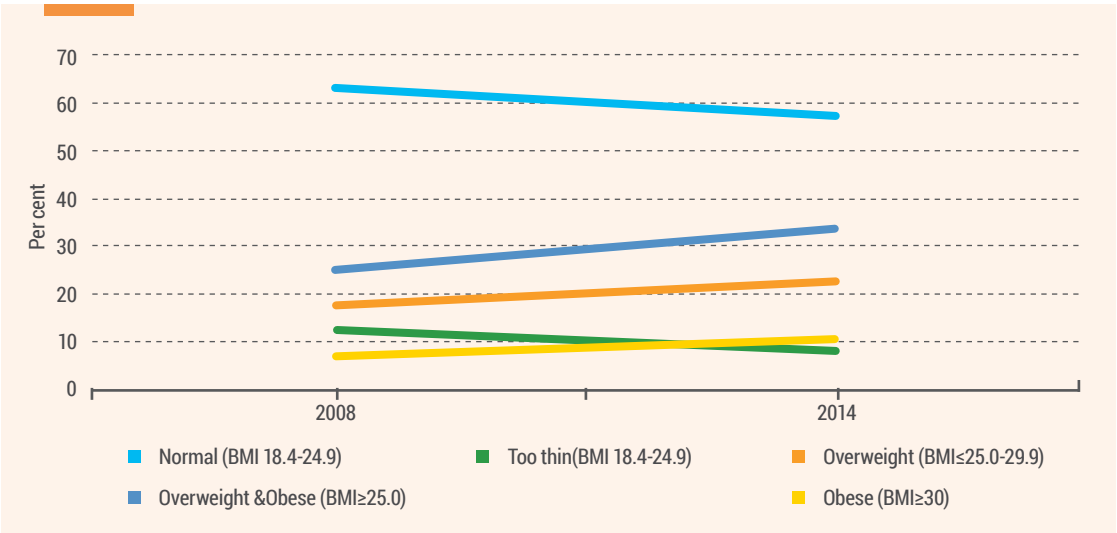
Source: *Kenya National Micronutrient Survey (2011), Ministry of Health*

Regional rates of underweight. The arid counties of West Pokot and Turkana have the highest prevalence or underweight populations (38.5 percent and 34 percent, respectively). The national rate of people underweight is 11 percent. The lowest rate is in Nairobi County (3.8 percent). Under-weight peaks at 12 months of age.

Urban settlements. Rapidly growing informal urban settlements are characterized by poor infrastructure, poor water supply and sanitation and low socioeconomic status. Consequently, populations in these areas may show an increased vulnerability to malnutrition.

Women of reproductive age. The nutritional status of women of reproductive age (15 to 49 years) has decreased between 2008 and 2014; however, this is due to **an increase in overweight and obesity in urban areas**, rather than through women being underweight (see Figure 8).

Figure 8 *Nutritional status of women of reproductive age*



Source: *KDHS 2008, 2014*

The percentage of women aged 15–49 with a normal body-mass index[43] decreased between 2008 and 2014. This is due to **an increase from 25.1 to 33 percent of women that are over-weight or obese**, which more than offsets the decrease from 12.3 to 9 percent of women that are underweight. In urban areas, the prevalence of over-weight and obesity in women aged 15–49 increased from 39.8 to 43.3 percent, while in rural areas it decreased from 20.1 to 18.8 percent (KDHS, 2014). With increasing urbanization and the changing lifestyles leading to unhealthy dietary habits and reduced level of physical activity, the levels of over-weight and obesity are on the increase. High rates of over-weight and obesity are observed even among the poor urban populations, particularly among women. **Kenya is experiencing a double burden of malnutrition due to under-nutrition and over-nutrition, sometimes co-existing in the same household.**

Refugee women and children in Dadaab. The prevalence of **global acute malnutrition amongst children aged children 6 to 59 months has stabilized at 8 to 10 percent over the last few years**.[44] The prevalence of wasting among pregnant and breastfeeding women is low. This may be partly attributed to the preventive rations provided to women during and after pregnancy until their children reach six months of age. However, the prevalence of anaemia is of concern: in 2017, the prevalence was over 60 percent among children over 40 percent for non-pregnant women.

Refugee women and children in Kakuma and Kalobeyei. The prevalence of global acute malnutrition declined steadily from 2010 to 2014 but increased from 7.4 percent in 2014 to 11.4 percent in 2016.[45] Global acute malnutrition in the new Kalobeyei settlement (established in 2016) was 8.9 percent. Stunting and anaemia levels were above 30 percent in both camps.

Adolescents and elderly persons. There is a major gap of data on the nutritional status of adolescents and elderly persons. The Nutrition and Dietetics Unit in the Ministry of Health is currently developing guidelines on healthy diets and physical activity, which will be implemented through the life cycle approach. This will include nutritional issues for adolescents and the elderly.

43 BMI is a measure of the weight against height of an individual.

44 UNHCR nutrition survey reports for Kenya.

45 UNHCR nutrition survey reports for Kenya.

Target 2.3

Double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment

2.3.1 Description of agriculture and smallholder producers in Kenya and links of target 2.3 with other sustainable development goals

Agriculture is one of the most important sectors in Kenya and is the main source of livelihood for the predominantly small-scale producers.[46] About 80 percent of the Kenyan population are rural dwellers, of which 50 percent are poor.[47] Performance of the agriculture sector is highly correlated with GDP growth rate such that whenever there is a dip in the agriculture sector, reduced annual economic growth follows. Thus, a declining agricultural sector performance implies a negative impact on overall economic growth trends. In this regard, Kenya Vision 2030 earmarks the agricultural sector under the economic pillar as a key element for achieving the envisaged 10 percent annual GDP growth rate.

Smallholder agriculture is regarded as the engine for rural growth and development. Smallholder farmers produce around three quarters of Kenya's food supply.[48] However, the sector has largely remained semi-subsistence, highly rain-dependent and poorly mechanized thereby constricting its performance. Most smallholders sell less than a quarter of their production, retaining most of it for in-house consumption.

Smallholder agriculture is vulnerable to multiple risks that are potentially detrimental to local livelihoods. Any increase in agricultural challenges, such as poor agricultural land and water management and increased frequency of climatic shocks, will exacerbate the poor performance of the sector, and have a knock-on effect on poverty and hunger within Kenya.

Nonetheless, agriculture holds great potential as a pathway for addressing poverty and hunger concerns given the linkages between agricultural productivity and nutrition, health and overall household welfare. Doubling agricultural productivity and incomes is required not only to meet growing national and global food demands, but also to attain other SDGs related to poverty eradication, health, education, gender empowerment and sustainable social and economic development.

Kenya differentiates four major agricultural sub-sectors: crops, livestock, fisheries and forestry. As shown in Figure 9, the crop sub-sector accounts for about 22 percent of national GDP. In this section, poultry and apiculture are also considered under separate headings.

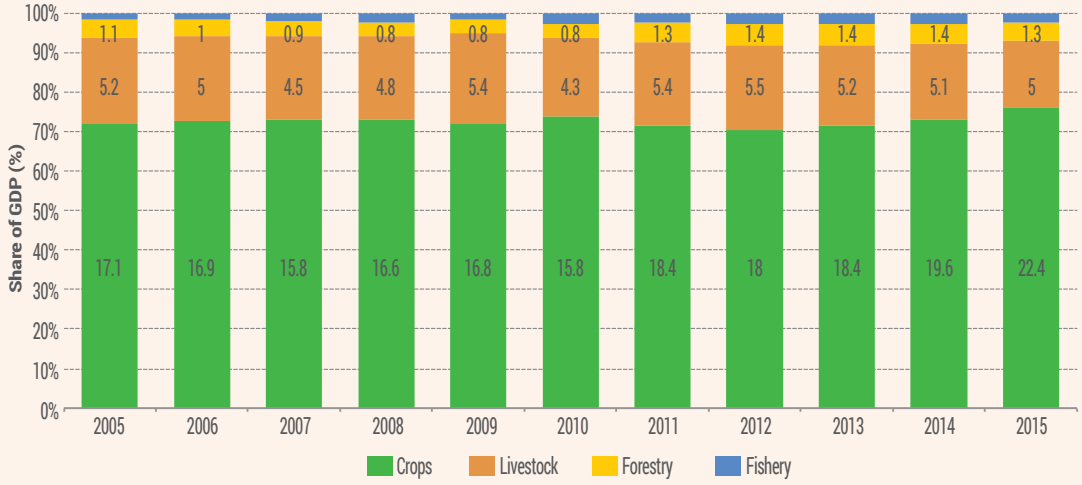
PHOTO:©FAO

46 Agriculture contributes about 25 percent to the Gross Domestic Product (GDP) directly and 27 percent indirectly through linkages with other sectors. It also accounts for about 65 percent of total exports, and 60 percent of total employment.

47 (Olwande and Mathenge, 2012).

48 Small-scale farming accounts for about 75 percent of total agricultural output and 70 percent of market supplies (Agriculture Sector Development Strategy, 2010–2030).

Figure 9 *Agriculture subsectors' contributions to Gross Domestic Product: 2005–2015*



Source: *Economic Surveys 2006–2017 (Kenya National Bureau of Statistics)*

Target 2.3 addresses SDG 5 (achieve gender equality and empower all women and girls) since gender equality will provide women with better access to land, rights, credit and productive assets – for the benefit of their families, their communities and the entire nation. In addition, this target addresses SDG 10 (reduce inequality within and among countries) in that increased agriculture productivity and income will address food security.

2.3.2 Current Status and Trends of Agriculture in Kenya: Crops

Enhancing crop productivity is a major pathway to improve food security. Although Kenya is an economic powerhouse in the region, the country's performance in terms of crop production is poor compared with neighbouring countries (see Figure 10).

Although world food production has generally kept pace with global demographics, **high birth and population growth rates in Kenya have outstripped national food production capacity**. The 2011 National Food and Nutrition Security Policy indicates that in the past three decades, food availability per capita has declined by more than 10 percent.

Figure 11 illustrates the growing divide between population size and agricultural productivity.

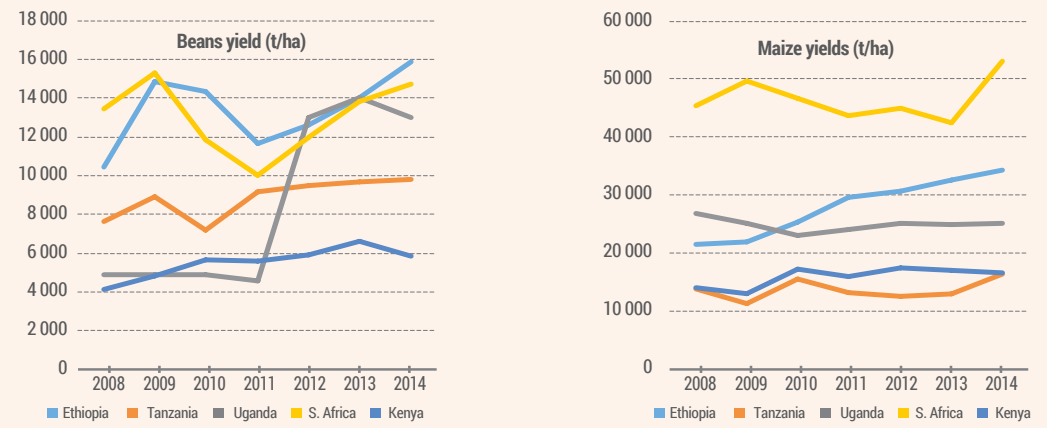
Despite decades of implementation of agricultural policies to promote growth in the sector, yields for the most important crops have stagnated (Figure 12). For instance, maize productivity has remained below 2 tonnes/ha against a potential of 6 tonnes/ha.

This decline in food self-sufficiency for Kenya[49] has transformed Kenya into a net importer of essential food products. Kenya is the largest food importer (of mainly wheat and rice) in East Africa; volumes are estimated at about US$1.3 billion annually.[50] This pattern has aggravated the unfavourable balance of trade, even for commodities where Kenya has comparative advantage, such as coffee and tea (Figure 13).

49 The annual staple food deficit is 20-30 percent (Muyanga and Jayne., 2014).

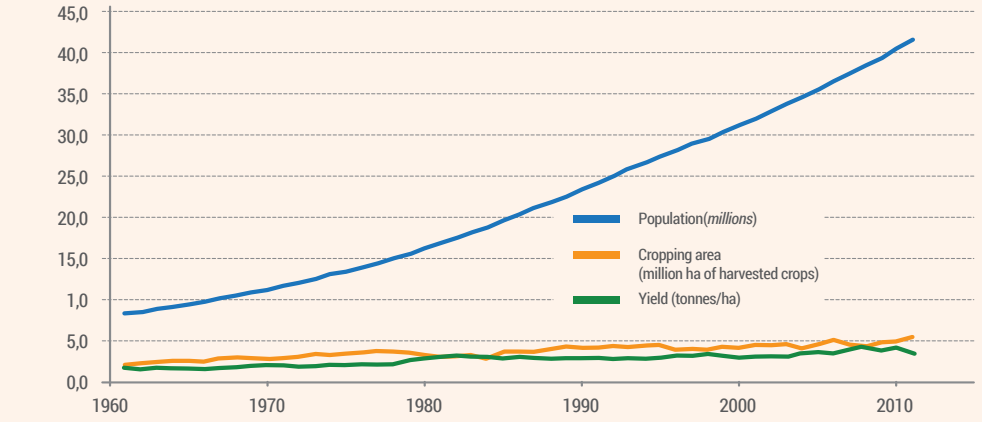
50 Ariga et al., 2010.

Figure 10 *Agriculture performance benchmark for maize and common beans: 2008-2014*



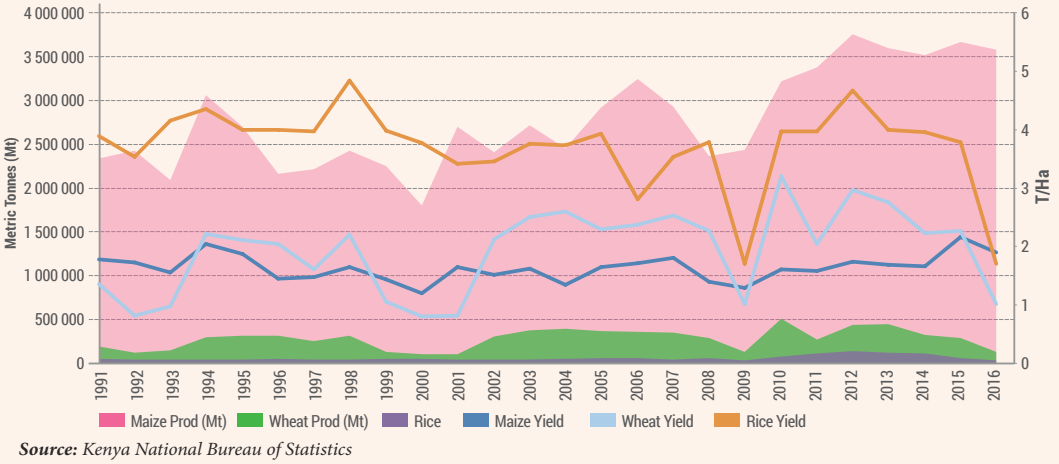
Source: *FAOSTAT crop production. http://faostat.fao.org/site/567/default.aspx#ancor*

Figure 11 *Kenya population, cropping area and crop yield: 1961-2010*



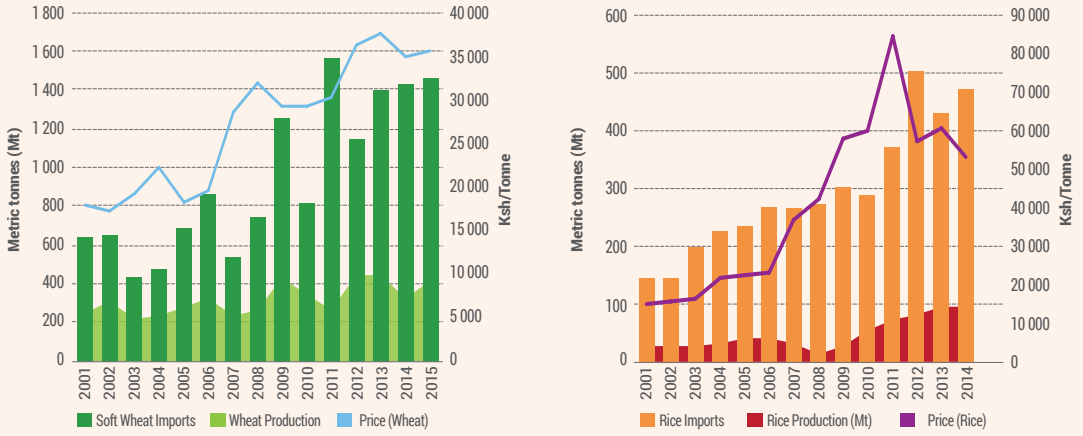
Source: *Developmental Regimes in Africa Project ASC-AFCA Collaborative Research Group: Agro-Food Clusters in Africa: Research Report 2013-ASC-4 - London/Leiden, January 2014.*

Figure 12 *Major staples annual output levels and yield trends, 1991-2016*



Source: *Kenya National Bureau of Statistics*

Figure 13 *Trends of trade in rice and wheat against local production: 2001- 2015*



Source: *FAOSTAT crop production. http://faostat.fao.org/site/567/default.aspx#ancor*

2.3.3 Factors contributing to low crop productivity

Immediate causes

Over-dependence on rain-fed agriculture. Kenya is a water-deficient country but over 95 percent of crops in Kenya are grown under rain-fed systems, which are highly vulnerable to weather variations. Irrigation farming is limited, and water resources are unevenly distributed, leaving many farmers, in particular smallholders, highly vulnerable to droughts. Accordingly, **the frequency and severity of crop failure due to weather-related shocks such as heat stress and poorly distributed rainfall and the magnitude of extreme events[51] such as pest and disease outbreaks have increased.**[52] These changes are adversely affecting crop output and incomes for many farmers.[53]

According to the National Water Master Plan 2030, the total area under agriculture is 2.9 million ha, of which only 4 percent is irrigated. High production risks and high costs of inputs (including the need to invest in high yielding crop varieties) have adversely affected investment in modern technologies. Estimates have been made that irrigation has the potential to increase crop output by 100 to 400 percent.[54] Although the Government is pursuing the development of irrigation to enhance food security, the rate of irrigation growth has been low[55] compared to other countries.[56]

Inadequate emergency preparedness and response to a changing climate. Water storage infrastructure is insufficient to address a high and increasing frequency of floods and droughts. ASALs in particular are characterized by erratic, low rainfall, prolonged droughts and flash floods. Turkana, Marsabit, Samburu, Isiolo, Wajir, Taita Taveta and Kajiado have experienced a high number of droughts between 2001 and 2016.[57]

51 Kerer, Jan. 2013. Background Paper on the Situation of Agricultural Insurance in Kenya with Reference to International Best Practices.

52 Kirimi, Lilian, Njue Eric, and Mary Mathenge. 2015. "Determinants of Crop Insurance Uptake Decisions in the Face of Climate Change: Evidence from Smallholders in Kenya." (June):1–4.

53 The 2017 main season of maize harvest was expected to drop by up to 25 percent owing to the recent outbreak of armyworms and drought effects.

54 Otieno, Dennis C., Lilian Kirimi, and Nicholas Odhiambo. 2015. "Can Irrigation Be an Answer to Kenya's Food Security Problem?" (19):1–5.

55 The growth rate of the irrigation area in Kenya is estimated at an average of 0.5% p.a.

56 Oduori, Leonard Haggai and Timothy Njeru. 2016. A Review Paper on Large Scale Irrigation in Kenya: A Case Study of Maize; Davies, Will and Josephine Gustafsson. 2015. "Water Resources in Kenya: Closing the Gap." (May); Ngigi, Stephen N. 2002. "Review of Irrigation Development in Kenya." The Changing Face of Irrigation in Kenya: Opportunities for Anticipating Change.

57 World Food Programme. 2016. *Comprehensive Food Security and Vulnerability Analysis*: Summary Report 2016.

In addition, **lack of an adequately integrated early warning and information system** has often affected early response to both weather-related shocks and disease/pest outbreaks. With climate change, invasive pests and emerging disease outbreaks are expected to increase in frequency and intensity, which, if unchecked, will further reduce crop productivity and farmer incomes.

Land degradation and soil fertility loss. Soil health is key to agricultural productivity in the long term. Attempts to boost farming productivity through intensified land preparation and the use of chemical fertilizers have degraded soil fertility to an extent that, in many places, the **soil has become unsuitable to support farming activities**. For instance, soil in Western Kenya has become highly acidic due to over-utilization of inorganic fertilizer. In addition, prolonged dry spells result in a low vegetative cover on this soil, making productive topsoil more prone to erosion by periodic, and increasingly volatile, rains and floods. Environmental degradation has increased, and previous soil conservation initiatives that increased production, such as the National Soil and Water Conservation Project and the National Agriculture and Livestock Extension Programme, could not be sustained and thus no longer exist.

Low mechanization. Although mechanization is recognized as critical for the intensification of the agricultural sector, it remains an impediment among small-scale farms. Fifty percent of power for land preparation, planting and harvesting as well as post-harvesting activities is derived from human labour, with only a small proportion (20 and 30 percent, respectively) of farmers employing draught animal power or motorized power (mainly motorbikes).[58] The inefficiency of human labour contributes to the high cost of production, low agricultural productivity and low return on investment.

Underlying causes

Limited market incentives. Although farmers could achieve higher yields per hectare by using better seeds, pesticides and fertilizers, they are confronted with multiple challenges such as **liquidity constraints and volatile input markets and inadequate output market incentives** to attract any meaningful investment. Input subsidies have played a major role in promoting access and affordability of fertilizer and seeds. While smart and targeted subsidy programmes (such as targeting of subsidized fertilizer under Kenya's National Accelerated Agricultural Input Access Programme; a national fertilizer subsidy programme on farmer participation in private fertilizer markets in the North Rift region of Kenya; and the Enhancing Agricultural Productivity Project) have helped vulnerable farmers to exploit their crop potential, sustainability of these programmes has remained a concern. Creating functional output markets where farmers see value of investment will stimulate demand for yield-enhancing input.

Previously, farmers had access to farm power services from cooperatives and tractor hire schemes for soil preparation and harvesting. Affordability of the technologies/machinery and accessibility of support services are important drivers of the adoption rates of mechanization technologies. Access to financial services (credit and insurance) is limited due to the high interest rates and prohibitive collateral requirements. As a result, only a small fraction of financial institutions are lending to smallholder producers.

Minimal food storage facilities. **Post-harvest losses among smallholder farmers are estimated to range between 20 and 30 percent** (Table 2) and are often caused by inefficiencies along the value chain such as poor handling and storage practices. In addition, lack of accurate national data affects efforts to optimize strategies for food loss prevention.

58 Ministry of Agriculture, 2016: National Policy workshop on smallholder agriculture mechanization in Kenya.

Table 2 *Post-harvest losses by commodity in Kenya*

Commodity	Losses (Percent)	Occurrence Level in Chain and Major Causes
Maize	21–29	Storage (*insect feeding, 6 months*)
Beans	7.7	Storage *(insect feeding, 4 months*)
Tomato	1–10	On-farm losses
Irish potato	5	Damage at harvesting
	15	Storage (*fresh weight loss, 4 months*)
	6.9–19.4	Storage (*sprouting, 4 months*)
	30	Storage (*greening and rotting*)
	3.7	Processing (*peeling*)
Mango	17.9 – 31.8	Harvesting (*pest and disease damage, immature harvesting*)
	1.6–2.9	Storage (*over ripening/decay*)
	2.6 – 4.7	Transport to market (*mechanical damage & ripening*)
	3–5	Marketing (*market glut and spoilage*)
Banana (Dessert)	32	Transport to market de-fingering, breakage, transit ripening
	4	Over ripening, rotting

Source: *International Centre of Insect Physiology and Ecology. 2013. Addressing food losses: Status and way forward for post-harvest research and innovations in Kenya. Policy Brief 5/13.*

Trade barriers. Farmers are faced with multiple trade barriers on both input and output markets, multiple tax regimes and levies by both national and county governments as well as low investments to increase the capacity to meet stringent standards in international markets, which has led to reduced growth in exports.

Lack of government investment. Research is essential for knowledge creation to promote sustainable agricultural growth, multi-sectoral industrialization and overall economic development. Extension and advisory services remain an important factor for propelling agriculture by linking research with farms and by helping develop and adopt modern farm technologies. Given the high rate of crop losses due to insects, pests and diseases, and the low productivity of crop farming, increased investment in extension and better coordination between public and private extension service providers are indispensable. However, despite agriculture's significant contribution to GDP, **the sector has, on average, received only 6 percent of the national budget over the last five years**. As a result, the sector is characterized by inadequate research and development and low extension service coverage.

Over-reliance on maize as a staple. Food security in Kenya is synonymous with maize. However, over-reliance on maize has locked farmers into producing the maize in agro-ecological zones (drought prone areas) that are better suited for more drought resistant crops such as sorghum and finger millet. The maize value chain is highly stressed due the high incidence of pest and diseases and unfavourable weather conditions, but it attracts significant policy intervention and investment at the expense of other lucrative value chains, such as rice and wheat. **With the rapid population growth and the competition for agricultural land against alternative uses, the focus on a single staple crop raises doubts about Kenya's future food and nutritional security.**

Lack of empowerment of women. At the farm level, a yield gap of 30 percent[59] exists between farms managed by men and women. This is attributed to constraints faced by women in accessing productive resources such as land, farming credit and critical farming technologies. The increasing gender disparity exacerbates poverty levels among vulnerable groups in rural areas. Although women usually dominate non-commercial value chains, once these value chains are upgraded into more organized ones for high value markets, men tend to take over. This pattern has been observed in sweet potato and French bean value chains in Homa Bay[60] and Meru, respectively. It is evident that **bridging the gender gap will contribute to better nutrition and reduced hunger and poverty**. Women's

59 Jägerskog, A. & Jønch Clausen. (2012). Feeding a thirsty world: Challenges and opportunities for a water and food secure future. Stockholm International Water Institute.

60 Njue E., Mathenge, M., & Ngig, M. 2013. Sweet Potato Marketing among Smallholder Farmers: The Role of Collective Action", a paper presented at the 4th AAAE conference in Tunisia in September 2013".

empowerment in agriculture and a better intra-household gender power balance over household resources are thus critical.

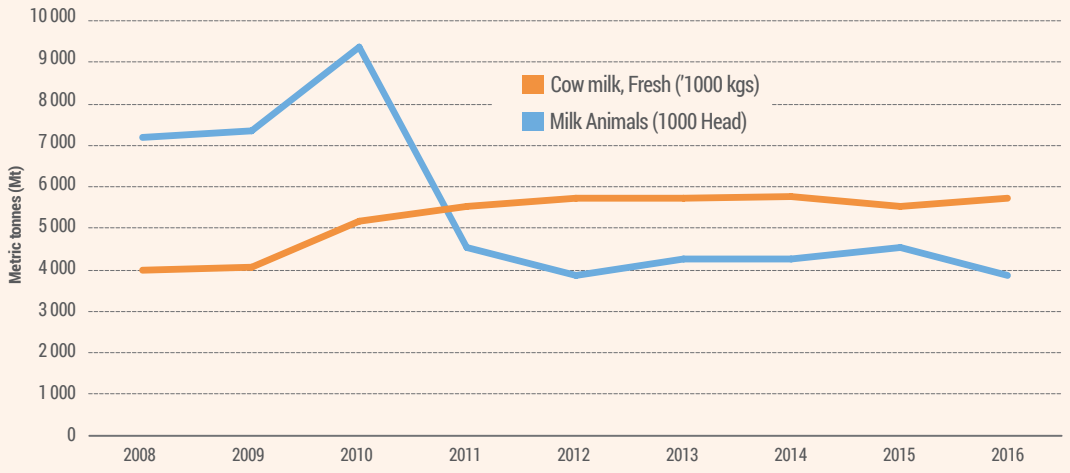
Lack of engagement from youth. The agriculture sector holds the potential to create employment opportunities for youths. However, although youths constitute over 60 percent of the population, only a small proportion of them engage in agriculture through their negative perception of agriculture and barriers such as limited access to land and capital. Therefore, **the engagement of the youth in the agricultural sector needs to be promoted from school and government (and other) interventions.**

2.3.4 *Current Status and Trends of Agriculture in Kenya: Livestock*

Dairy cattle. Dairy farming accounts for 6 to 8 percent of the country's GDP or 30 percent of the livestock subsector's total contribution to GDP. It is a major activity in the livestock sector and an important livelihood to approximately 1 million small-scale farmers[61] mainly concentrated in the high rainfall areas of Kenya. These farmers contributed about 80 percent of the total milk production of 4.1 billion litres (2016). Figure 14 shows the number of dairy cattle and annual milk production in Kenya between 2008 and 2016. Average national milk productivity is about 750 litres per cow but this varies by region. The total milk production from sheep, goats, cows and camels is estimated at 5 billion litres.

61 Oder-Waitituh J. A. (2017). Smallholder dairy production in Kenya: A review. Livestock Research for Rural Development 29(7)

Figure 14 *National dairy cattle population and milk production: 2008–2016*



Source: *FAO Statistical Yearbook for Africa 2017*

Approximately 56 percent of cows milk is marketed, and the remainder retained for household consumption.[62] The largest share of marketed milk is sold raw through informal markets: direct farm sales to consumers (42 per cent), "hawked"[63] milk (23 per cent), sales to milk bars (15 per cent) and to co-operatives (6 per cent). Processed milk accounts for only 14 per cent of all milk sold in Kenya. However, the volume of processed milk has grown continuously from 143 million litres in 2002 to 600 million litres in 2015.

Current per capita consumption of milk is 100 litres per annum. As Kenya's population is increasing at a rate of over 1 million people per year, **at current milk production levels there will be a net deficit of milk by 2024**.

Small ruminants. Sheep and goats play a key role in pastoral households' food security and incomes owing to their short-generation intervals, high adaptability and versatile feeding habits. There are an estimated 27.7 million goats and 17.1 million sheep that produced 69,000 metric tons of goat meat worth KSh 28.7 billion and 185,000 metric tons of mutton/lamb worth KSh 72.4 billion in 2015.

While they can survive in diverse production systems, a large proportion of goats and sheep are kept under extensive grazing systems in ASALs. Intensive systems with smaller herds in a confined environment are more common in agricultural potential lands, including peri-urban areas. Women are more involved in small ruminant production (as it provides food security at household level) compared to men, who are more inclined towards large ruminants.

Beef cattle. Kenya's ASALs constitute more than 84 percent of the country's landmass and are home to approximately 20 percent of the population. Nomadic pastoralism is the main economic activity in ASALs' 24.2 million hectares (covering 50 percent of the ASALs), while ranching and other livestock-keeping utilizes 15.1 million hectares (31 percent).[64] Although most beef is produced from rangelands, dairy cattle culls contribute substantially to the national supply of meat. On average, the country produced 2,073 metric tons between 2010 and 2012 annually of beef worth KSh 103.6 billion.[65]

Camels. Camels are more drought resistant than cattle, and their milk is highly nutritious. Camels can produce more milk from poor feed than any other dairy species,[66] and, unlike cows, can go for many days without water and still produce milk. Accordingly, with the recurring droughts in the arid areas, pastoralists have been shifting more towards keeping camels. The camel population is about 2.97 million,[67] and in 2015 the country produced 19,000 metric tons of camel meat worth KSh 7 billion.

2.3.5 Factors Affecting Dairy, Small Ruminant and Camel Productivity

Immediate causes

Low milk yields. **Average milk productivity is about 3.7 litres per cow per day**, which is low compared to other countries. Denmark and Australia, for example, produce well above 20 litres per cow per day.[68] Low productivity can be attributed to poor animal breeds, diseases, and lack of sufficient feeds/pasture and water.

Lack of high quality breeds. The majority of dairy farmers are unable to acquire good breeds due to financial constraints. This coupled with limited access to and high cost of artificial insemination and veterinary services means that **farmers cannot improve their breeds** and thus have difficulty in increasing productivity and economic returns.

Declining herd sizes. With increasing population, the land available for feeds and

62 MoALD, 2012

63 This involves traders who sell milk along the streets and in urban areas

64 The remaining 9.1 million hectares or 19 percent are used for agriculture including agro-pastoralism.

65 Source: Ministry of Agriculture, Livestock and Fisheries, 2015: Economic Review of Agriculture

66 http://www.fao.org/dairy-production-products/production/dairy-animals/camels/en/

67 https://www.knbs.or.ke/livestock-population/

68 Technoserve, 2013


PHOTO:©FAO

pasture has been declining. As a result, the cost of animal feeds has increased over time. This has led farmers to **reduce their herds to sizes that can become economically unfeasible**.

Lack of access to water. Water resources are unevenly distributed both geographically and temporally. **Insufficient water harvesting and storage infrastructure** exposes dairy farmers to high risks of water shortages.

Underlying causes

High cost of production. Dairy production costs differ between production systems. In intensive zero-grazing systems it costs on average KSh 19 to produce a litre of milk, while the cost is about KSh 10 in more extensive systems such as open grazing.[69] The main cost drivers are feeds and hired labour in intensive systems and family labour in open grazing systems.

Lack of competition affecting prices. Farmers receive low prices, especially during wet seasons when milk supply outstrips demand. The formal milk sector is highly concentrated with only few processors controlling over 80 percent of the market share. This lack of competition allows processors to pay low prices to producer while charging higher consumer prices compared to informal channels, and has led to a large difference between formal and informal consumer prices. The prices paid by processors and the lengthy payment schedules cause dairy farmers to prefer selling to the informal sector. Figure 15 shows how real producer prices (nominal prices adjusted for inflation using the Consumer Price Index) have been decreased over the past decade and, given the above-mentioned costs of production, hardly leave any profit margin for producers.

Inadequate market access for sheep/goat milk. As complementary livestock, small ruminants provide a pathway for poor households to climb up the livestock ladder.[70] While sheep milk production is not common in Kenya, dairy goat farming has become a lucrative venture. This is especially so in the highlands where small land sizes coupled with high human population density has constrained dairy cattle farmers, necessitating restructuring of the agricultural enterprises to sustain livestock incomes. However, market access remains a bottleneck due to a variety of reasons[71] such as dysfunctional and fragmented dairy goat and goat milk markets, low levels of consumer awareness on the benefits of goat milk and so preference for cow milk, and susceptibility of goats to disease and predators.

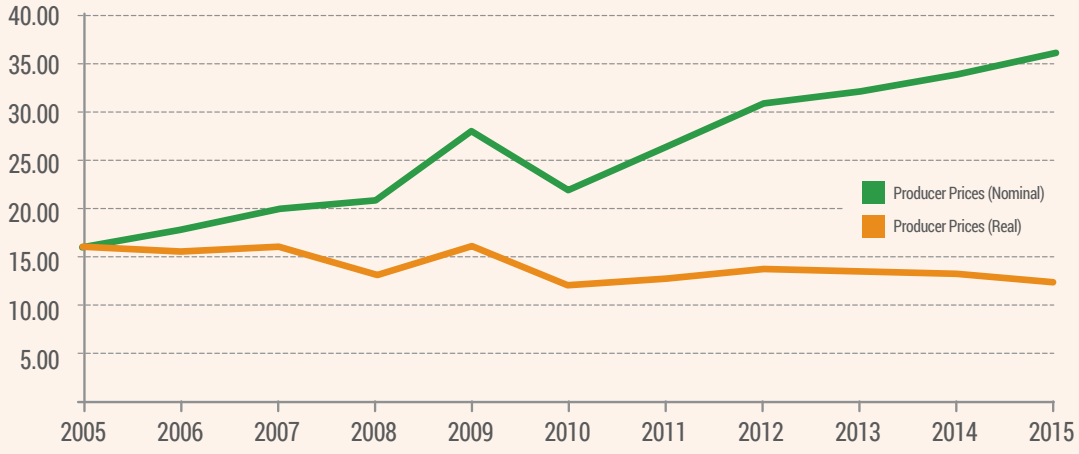
Insufficient investment in camel production. Given the rising prominence of camels, there is a need to address issues such as breeding, diseases, milk and meat production and marketing.

69 Kenya Dairy Board 2016: Report of a study on assessing the cost of production structures in dairy systems in Kenya. Tegemeo Institute and Kenya Dairy Board

70 idem

71 Mbindyo, C.M., Gitao, C.G. & Peter, S.G. Trop Anim Health Prod (2017). https://doi.org/10.1007/s11250-017-1397-2

Figure 15 *Trends in producer milk prices in KSh/Litre: 2005-2015*



Source: *Highlights of the Kenya's Dairy Industry, 2017. Tegemeo Institute.*

2.3.6 Factors Affecting Beef Productivity (Arid and Semi-Arid Counties)

Immediate factors

Drought. The threats from persistent droughts have escalated in ASALs, with Northern Kenya recording 28 major droughts in the past 100 years and four in just the last 10 years. Given the changing global climate, this trend is likely to continue or even worsen. These recurrent droughts and lack of supporting infrastructure have resulted in increased loss of livestock, leading to income loss.[72] Although food relief is important in addressing short-term food shortages and related crises in ASALs, it is not sustainable in the long term.

Decline in pastoral systems. Slaughtered weight has been marginally declining as well as average herd sizes among pastoralist households.[73] The main causes of declining herd sizes are persistent droughts and diseases, hence initiatives that encourage households to expand their herd sizes through livestock loss mitigation such as restocking and livestock insurance need to be strengthened.

Inadequate pastures and feeds. Pasture availability in rangelands has been on the decline, mainly due to persistent droughts and invasive species affecting traditional grasslands. Migration between dry and wet season grazing is key in maintaining pastoral systems. However, vegetation availability has been declining. With pasture availability declining, pastoralists are reducing herd sizes, with negative impacts on food security and incomes.

Issues with land tenure. In pastoral areas, problems relating to land tenure and ownership lead to community conflicts and cattle rustling. This is coupled with increased encroachment of pastoral lands by ranchers and agro-pastoralists, limiting available land for pasture. Moreover, weakened community-based management structures such as environmental management/ grazing management committees have not been well supported legally to enforce deliberations.

Underlying factors

Inadequate government investment. The 2003 Maputo Declaration recommends that African nations should allocate at least 10 percent of

72 Chantarat, S, Mude, A.G, Barett, C, Carter, M., 2012. Designing index based livestock insurance for managing asset risk in Northern Kenya. Journal of Risk Insurance. 80 (1), 205-237.

73 Mburu S., Otterbach S., Alfonso S., Mude A., 2016. Income and asset poverty among pastoralists in Northern Kenya.

their national budgets to the agriculture sector in order to boost agricultural production. Budgetary allocations to the agriculture sector as a whole in Kenya have been far below this recommended level, reaching only 4.2 percent of the national budget 2016/2017. Counties are investing about 6 percent of their budgets on average to agriculture.

In addition, the Government has had little economic or political interest in investing in the ASALs, which have been seen as marginal areas with little economic potential. This perception has resulted in low investments in infrastructure such as roads and social amenities (markets, schools), as well as political exclusion. However, with the devolved system of Government, more resources are being channelled to ASALs counties, which provides good opportunities for county governments to finance priority investments. The provision of livestock extension services is now also a county government function.

Inadequate animal health services. The delivery of animal health services by the Government in ASALs has been underfunded. Efforts by non-governmental organizations and the private sector to provide animal health services in these regions have so far not been sufficient. Few drug stockists and a lot of self-prescription from farmers results in disease outbreaks and significant losses of livestock.

Inadequate health restrictions/infrastructure for movement of livestock. Disease-free holding zones are a precondition for the export of livestock. However, much of the infrastructure, such as holding grounds, water pans and boreholes, built by the Kenya Meat Commission is in disrepair. Chronic underfinancing and mismanagement of agricultural investments has driven this. Since 2014, however, the Government has been constructing the Bachuma Livestock Export Zone in Taita Taveta, aimed at improving the export of livestock and livestock products.

Poorly organized markets and lack of market information. The livestock markets in the ASALs are largely unorganized, with no proper structures for holding animals. There are few livestock marketing associations, and pastoralists mostly sell their livestock through brokers who offer low prices. There is low capacity to collect market data on a regular basis that could help pastoralists identify the most competitive markets within the country and in East Africa. This significantly reduces market participation and bargaining power, which in turn has negative consequences on the decision-making capacity and eventually on the livelihoods of the pastoralists. In addition, there is the challenge of pastoral community dependence and orientation towards livestock – livestock is taken as both a cultural value and a mainstay of pastoralist economies. There is need therefore to integrate livestock markets with drought information and livestock management to assist pastoralists to plan grazing ranges. Pastoralists should also be encouraged to sell livestock at the right time based on early warning information about any impeding drought to optimalize market prices.

2.3.7 *Current Status and Trends of Agriculture in Kenya: Poultry*

Kenya has an estimated poultry population of 31 million birds. Of these, 75 percent are traditional chickens, 22 percent are broilers and layers and 1 percent are breeding stock. Other poultry species like ducks, geese, turkeys, pigeons, ostriches, guinea fowls and quails make up the other 2 percent of poultry production.[74] The two major systems for poultry production in Kenya are commercial for broilers and layers, and traditional. While traditional chickens are mainly found in rural areas, broilers and layers are kept in urban and peri-urban areas.

The commercial poultry system produces over one million chicks per week in Kenya. The commercial sector is supplying a growing urban population and growing retail sector, such as fast food branches, supermarkets and restaurants. The demand for commercial chickens and eggs is high and growing. Despite the growing demand, challenges facing the commercial sector include high costs of feeds, drugs and vaccines, insufficient supply of day-old chicks, and lack of adequate slaughter houses.

74 Ministry of Agriculture and Livestock Development Report, 2012.

Feed cost accounts for 60–75 percent of the total cost of commercial poultry production[75] as exotic breeds require high energy feed to meet their nutritional demands. Although efforts have been made towards developing on-farm feed, the cost of ingredients is relatively high. Risks associated with handling the feed can also affect the quality of the final feed products.

2.3.8 Factors Affecting Poultry Production

Lack of foundation breeds and persistent in-breeding continue to depress genetic performance of poultry, contributing to low productivity. While commercial farmers are able to obtain, albeit expensive, foundation breeds, poor and resource-constrained poultry farmers have no means to access the new breeds such as the kuroiler, a relatively high egg and meat-yielding crossbreed which has been introduced in Kenya, and which has similar characteristics to traditional types in terms of adaptability, management and rearing. Breed upgrading as well as restocking programmes targeting the poor are quite limited.

In traditional poultry farming, birds are usually kept under free ranging systems with minimum demands on feed and general management.[76] Women are the predominant owners of poultry, and it has been acknowledged that interventions aimed at enhancing poultry productivity have the potential to ameliorate household food security, nutrition and incomes in rural areas.[77] However, poultry producers, especially those under the traditional system, lack appropriate technologies to increase the number of birds reared at any given time, which results in unreliable and fragmented market supplies.

Pests and diseases such as avian influenza and Newcastle disease are the major cause of poultry deaths in Kenya and can result in 100 percent loss of birds.[78] The risk of infection and overall bio-security vulnerability depends on the production systems being practiced. It has been argued that fear of total loss discourages farmers from keeping large flocks. Inadequate access to poultry extension and veterinary knowledge among farmers with regard to the management of birds is the key driver of high poultry mortality rates.

The high cost of poultry production has rendered market access for both chicken and egg farmers difficult. Chicken production is uncompetitive with imported stock from the neighbouring countries, such as Uganda, and as far as South Africa. Market access for smallholder producers in rural areas is extremely limited due to a lack of necessary market infrastructure. Inadequate markets force farmers into cost inefficient transactions with middlemen. While the emergence of avian influenza has affected poultry markets in the recent past, panic culling in relation to disease outbreaks can also result in significant income loss.

2.3.9 Current Status and Trends of Agriculture in Kenya: Wild-catch Fisheries

Fisheries play a significant role in socio-economic development by creating employment, generating revenue and contributing to food security. Both capture and aquaculture fisheries are present in Kenya. Capture fisheries entail exploitation of natural fishery resources in coastal marine waters, major inland lakes and rivers.

Currently, **fisheries contribute about 0.58 percent to the country's GDP** at ex-vessel/farm gate prices, and annual fish production is valued at approximately KSh 22 billion.

Over 70 percent of fish and fish products consumed locally are from wild capture fisheries. Freshwater fish accounts for 96 percent of total fish production, of which more than 80 percent comes from Lake Victoria. However, in recent years **fish production has declined**

75 Waldroup, P. W. 2002. "Poultry Nutrition and Feeding." Feedstuffs 73(29): 56–65.

76 Sonaiya, E. B. and S. E. J. Swan. 2004. "Small-Scale Poultry Production." FAO. *http://www.fao.org/docrep/008/y5169e/y5169e08.htm#TopOfPage*

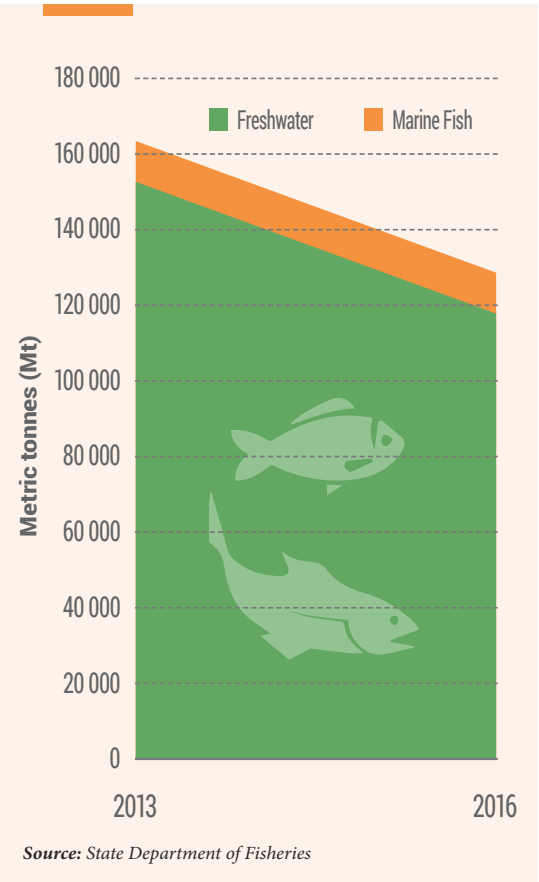
77 Macharia, John et al. 2016. Gendered Analysis of the Demand for Poultry Feed in Kenya.

78 Nyaga, Phillip. 2007. "Poultry Sector Country Review-Kenya." FAO Animal Production and Health Livestock Country Reviews. *ftp://ftp.fao.org/docrep/fao/011/ai319e/ai319e00.pdf*

considerably and between 2013 and 2016 production decreased by 21.3 percent from 163,400 to 128,600 metric tons, mainly due to a decrease of freshwater fish production (by 22.5 percent from 154,300 to 119,600 metric tons (see Figure 16)). By contrast, the volume of marine fish landed only declined by 0.45 per cent from 9,200 to 9,100 metric tons.

Aquaculture potential is estimated at 1.4 million ha, of which only 2 percent is exploited (MTP II, 2013–2017).

Figure 16 *Fish production in Kenya 2013–2016*



Source: *State Department of Fisheries*

Only 10 percent of the fish caught in Kenyan waters are exported, while 90 percent are consumed domestically. A significant proportion of this caters for the local population. The per capita consumption of fish is estimated at 4.5 kg/year with a low contribution to overall protein intake of 7.6 percent. This is attributed to the fact that many Kenyans do not regularly consume fish for historical or cultural reasons.

2.3.10 Factors Affecting Wild Fisheries Productivity

Immediate causes

Environmental degradation. Infestation of aquatic weeds such as water hyacinth or hippo grass, have reduce fish populations. Water hyacinth is a very significant pest in Lake Victoria. In marine fisheries, pollution with plastic may be a factor.

Population growth. Increased competition for water resources due to population growth or growth in other economic sectors requiring water is placing increasing pressure on water resources, reducing water quality and fish stocks.

Unsustainable fishing methods. Destructive fishing methods, such small net sizes, have decimate fish populations disproportionately to the yield. Overfishing, especially in Lake Victoria, Lake Naivasha, Lake Baringo and Lake Jipe, have reduced available fish stocks and decreased fish populations.

Increased climatic variability is causing fresh waterbodies to decrease or dry out as well and warming of coastal marine areas is causing coral bleaching.

Underlying causes

Weak enforcement of fishing regulations. Illegal and unregulated fishing is able to flourish due to lack of enforcement of regulations protecting fisheries.

Inadequate fisheries infrastructure, for example, cold storage facilities, landing sites, markets and roads, at major fishing sites is leading to high post-landing losses.

Inadequate marketing channels and inefficient marketing systems combined with a lack of accredited food quality control laboratories and inspectors and laboratory technicians to negatively impact productivity.

Lack of investment in fisheries. Fishermen are mostly poor and do not have sufficient savings, surplus or access to credit to re-invest in better equipment or other aspects along the fish value

chain. Investments in fisheries and aquaculture are also generally perceived as risky, which keeps the level of investment low. There is also low uptake of innovative, more efficient or sustainable techniques and technologies.

2.3.11 Current Status and Trend of Agriculture in Kenya: Farmed fish

The main types of fish currently farmed in Kenya are tilapia, catfish, carp and trout. In 2015 an estimated 27,125 tons of farmed fish were produced. Tilapia represents about 75 percent of total production, followed by catfish (17 percent), carp (6 percent) and trout (<1 percent). Farmed fish production increased from 4,900 metric tons in 2009 to 24,100 metric tons in 2014 (Figure 17).

2.3.12 Factors Affecting Farmed Fisheries Productivity

Kenya's Economic Stimulus Programme launched in 2009 caused the notable large jump in farmed fish production in 2010 and 2011. However, production decreased by 36.4 percent between 2014 and 2016 (Figure 17). This is attributed to the transfer of fish farming from the national to county governments, as most county governments did not prioritize fish farming, compromising the technical back-up needed by farmers in this relatively new enterprise.

Even if this recent decrease is reversed and the upward trend continues, production would stay far below the potential. There are more than 1.14 million hectares which could be used for fish farming. This would enable a production capacity of over 11 million tons per year.[79] Kenya is a net exporter of fish, mainly Nile perch from Lake Victoria; however, data on imports and exports may be unreliable due to cross-border smuggling of fish. The forecast for aquaculture is largely positive. This is in line with global forecasts for the industry that predict that aquaculture will continue to grow at a fairly rapid rate despite its challenges.[80]

2.3.13 Current Status and Trend of Agriculture in Kenya: Forestry

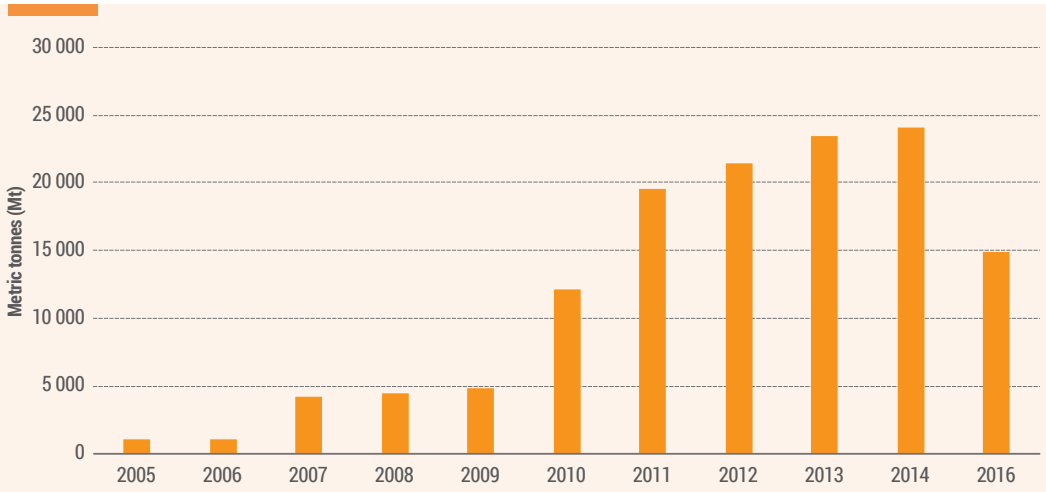
Forests and tree-based agricultural systems contribute directly and indirectly to the livelihoods of an estimated one billion people globally.[81] Trees and forests are vital for their

79 FAO Fishery and Aquaculture Country Profiles 2015, The Republic of Kenya; Market study of the aquaculture market in Kenya, 2016.

80 Lem, A., Bjorndal, T. & Lappo, A. 2014. Economic analysis of supply and demand for food up to 2030 – Special focus on fish and fishery products. FAO Fisheries and Aquaculture Circular No. 1089. Rome, FAO. 106 pp.

81 Center for International Forestry Research. 2013. *Food security and nutrition: The role of forests*. Bogor, Indonesia.

Figure 17 *Farmed fish production in Kenya (metric tons) 2005–2014*



Source: *State Department of Fisheries*

role in the provision of ecosystem services to agriculture. They generate income and employment for many people, often the most vulnerable. They deliver ecosystem services vital for food security and nutrition in the long term, including water and carbon cycle regulation and protection of biodiversity.[82] They play critical ecological, social, cultural, and economic functions and contribute both directly and indirectly to national and local economies through revenue generation.

However, the role of forests in supporting human food security and nutrition remains largely under-researched and understood both in Kenya and globally. An improved understanding is key to building synergies and minimizing trade-offs between biodiversity conservation and sustainable agriculture.

In Kenya, it is estimated that forestry contributes 3.6 percent of GDP, excluding charcoal and direct subsistence uses.[83]

Forested catchments are key for the supply of large proportions of water for domestic and agricultural use, but **the current forest cover of about 6.99 percent of the land area of the country is still below the constitutional requirement of 10 percent**.[84]

2.3.14 Factors Affecting Forestry Productivity

Population growth. Kenya's population is growing at an average rate of 2.9 percent per year and this high population growth has increased demand for agricultural land, road and industrial infrastructure. Forest resources are, therefore, rapidly declining and as a result a high proportion of forests, wetlands and water catchment towers such as the Aberdares ranges, Mau forest complex, Cheranganyi Hills, Mount Elgon and Mount Kenya have been lost. This has been exacerbated by destructive activities such as illegal logging, charcoal burning, squatter farming and housing developments, which are endangering plant and animal species. Deforestation deprived Kenya's economy of KSh 6.6 billion in 2009 and KSh 5.8 billion in 2010, far outstripping the roughly KSh 1.3 billion injected from forestry and logging each year.[85]

In order to improve, develop and achieve the desired forest cover, there is need to balance the needs of the people with opportunities for sustainable forest conservation, management and utilization; underscore forestry's unique role in both climate change mitigation and adaptation; deepen community participation in forest management by the strengthening community forestry associations and introducing benefit-sharing arrangements, recognize customary rights and user rights; adopt an ecosystem approach for the management of forests, and integrate good governance, transparency, and accountability into all aspects of forestry management.

2.3.15 Apiculture

Bee keeping has been practiced traditionally for a long time and has become an important enterprise in the livestock sector. However, only 20 percent of the country's honey production potential (estimated at 100,000 metric tons) has been tapped.

While apiculture is practiced in all parts of the country, it is a major activity in the ASALs due to their abundance of bee flora.[86] Bee keeping is less labour intensive than other agricultural enterprises.

The main challenges facing apiculture include lack of adequate skills on managing bees and handling hive products, underdeveloped marketing system for hive products, and low prioritization of bee-keeping in relation to other enterprises in the wider agricultural sector.

82 Food and Agriculture Organization of the United Nations. 2017. Sustainable forestry for food security and nutrition: *A report by the High Level Panel of Experts on Food Security and Nutrition*. Rome, Italy.

83 Government of Kenya. 2015. National Forest Policy.

84 Government of Kenya. 2015. National Forest Policy.

85 Joint UNEP-Kenya Forest Service Study (2012). The Role and Contribution of Montane Forests and Related Ecosystem Services to the Kenyan Economy.

86 Government of Kenya, 2017. *http://www.nafis.go.ke/livestock/bee-keeping*

Target 2.4

By 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality

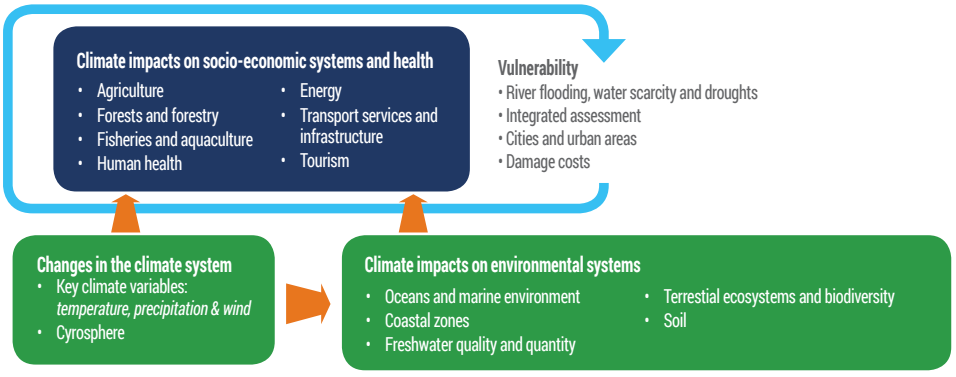
2.4.1 Definition of sustainable food production systems and resilient agricultural practices and links of target 2.4 with other sustainable development goals

Globally, food production systems – which include all processes and infrastructure involved in feeding a population – growing, harvesting, processing, packaging, transporting, marketing, consuming, and disposing of food and food-related items, plus the inputs needed and outputs generated at each of these steps – are faced with the increasing challenge of meeting the rising demand for food. While food production must double by 2050 in order to feed the world's growing population, the natural resource base, which is the anchor of food production, is being eroded faster than it can be replenished. Therefore, **the concept of sustainable food production systems is based on the principle that current attempts to enhance food security need both to increase production and improve responsible consumption without impairing the functioning of underlying ecosystems.**

In practical terms this means that as demand for agriculture production increases and the extent and intensity of land use increases, concomitant efforts to reduce biodiversity loss and ecosystem degradation and so sustainably maintain agricultural productivity and ecosystem resilience need to be undertaken. Agricultural production needs to be sustainable.

Sustainable agriculture can be defined as "**a whole systems approach to food, feed, and fibre production that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. It combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. Inherent in this definition is the idea that sustainability must be extended not only globally but indefinitely in time and to all living organisms including humans.**" Target 2.4. considers how food production systems can remain sustainable, incorporating the increasing demands on them with increasing resilience to climate change and resultant shocks, maintaining biodiversity and restoring or maintaining soil productivity. Figure 18 shows the relationship between climate change and socio-economic and environmental systems.

Figure 18 *Relationship between climate change and socio-economic and environment systems*[87]



87 Source: Ellis, 2014

Similar to other developing economies, the agricultural sector in Kenya currently needs to increase food production to meet growing consumption demand, while conserving biodiversity through a balanced use of the limited natural resources. Given its large contribution to the economy in terms of GDP and food security, it is imperative that Kenya finds means of ensuring its agriculture is sustainable.

Moreover, this needs to occur within the context of climate change. Although there is a lack of evidence about trends in extreme temperature, extreme rainfall and drought in East Africa, droughts and storms have been more frequent in the region in the last 30–60 years. Continued warming in the Indian Ocean has been shown to contribute to more frequent East African spring and summer droughts over the past 30 years. It is not clear whether these changes are due to anthropogenic influence or to natural climatic variability.[88]

SDG 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation) relates to target 2.4 in that better infrastructure, greater access to innovation (e.g. research, extension and other platforms of bringing new knowledge and technologies in agriculture to the farm and processor level) and a stronger food processing industry are indispensable for the sustainable improvement of food security in Kenya. SDG 12 (ensure sustainable consumption and production patterns) is also related to this target because production systems will have to become far more efficient and sustainable to bring quality food to all Kenyans while protecting land, water, plant and animal resources and their diversity. At the same time, food losses must be reduced, and consumers must become more aware and be better empowered to make healthy food choices. In addition, SDG 13 (take urgent action to combat climate change and its impacts) is relevant to this target because agricultural production systems both contribute to climate change and are strongly affected by it. Kenyan agriculture has to become more climate sensitive and resilient.

2.4.2 *Current status and trends of food production systems and resilient agricultural practices in Kenya*

Agriculture is the mainstay of the Kenyan economy, contributing 30 percent directly to GDP,[89] even though only about 10 percent of the total land area is arable.[90] Tea and horticulture are the backbone of agricultural exports followed by coffee. The sector is not only the driver of Kenya's economy, but also the means of livelihood for the majority of Kenyan people.

While the country's ability to feed itself has improved significantly, **Kenya is still far from being self-sufficient in terms of food production** and has to import food, both formally and informally. Productivity in the sector is variable, chiefly reflecting rainfall patterns. The sector is facing major challenges including stagnant or declining productivity levels, under-exploitation of land, inefficiencies in the supply chain due to limited storage capacity, lack of post-harvest services, poor access to input markets and low value addition of most agricultural exports.

About 70 percent of Kenya's livestock population is located in extensive agricultural systems in Kenya's arid and semi-arid lands, where large herds pose threats to both land and vegetation degradation due to overgrazing.

In Kenya, extensive (pastoralist) farming is mainly practiced in the Rift Valley and the arid lands of northern Kenya and is considered to be the most vulnerable to shocks and so low in resilience. Dietary diversity is low, which shapes the nutrition status of households.

Ninety-five percent of crops are rain fed in Kenya making the food production systems highly sensitive to changes in weather patterns. In particular, **smallholder farming systems are considered particularly vulnerable to shocks**

88 *The IPCC's Fifth Assessment Report. What's in it for Africa?* Climate and Development Knowledge Network. *https://cdkn.org/wp-content/uploads/2014/04/AR5_IPCC_Whats_in_it_for_Africa.pdf*

89 Kenya National Bureau of Statistic, 2016. Economic Report 2016.

90 World Bank.

and to have low resilience due to their over-dependence on rain-fed production. This renders them highly vulnerable to weather and other non-localized shocks such as pests and disease outbreaks.

Only 16 percent of the arable land is suitable for rain-fed agriculture in Kenya. In March 2017, Kenya declared the drought a national disaster after food insecurity in the arid and semi-arid lands deteriorated to crisis levels (IPC phase 3). Some 3.4. million people were in need of food assistance by August 2017.

2.4.3 Factors affecting sustainable food production systems in Kenya

Immediate factors

Increasing climate variability. Ochieng et al.[91] show that climate variability has adversely affected the sustainability of the use of natural resources in agricultural production in Kenya. This situation is expected to worsen as projections show that temperature variations will have greater adverse impacts on revenues from mainstream industrial crops like tea, whilst suppressing the performance of staple crops.

In Kenya, livestock production and in particular enteric fermentation[92] is the largest contributor of greenhouse gas emissions, which are the leading cause of climate change.[93]

Soil degradation. Widespread soil degradation has led to a growing proportion of agricultural land being less responsive to inorganic fertilizer. Low crop response to fertilizer contributes to stagnant or declining yields and low profitability of fertilizer use. This is impeding the Government's efforts to sustainably increase fertilizer application on smallholder farms. In Western Kenya, an increase of soil acidity beyond tolerable levels is partially responsible for the declining staple crop output in the region.[94] This trend suggests the need for updated assessments of soil quality trends as well as updated and more precise fertilizer recommendations for a range of crops grown by smallholders.

Soil degradation has also led to a decline in soil fertility, creating conducive environments for opportunistic crop infestation such as striga, which exacerbates low crop productivity.[95] In addition, the loss[96] of biodiversity due to soil degradation is a driver of declining resilience in agricultural ecosystems, increasing their vulnerability to pests and disease-related shocks.[97]

Pre- and post-harvest losses. High pre- and post-harvest losses continue to weaken the already burdened food production system in Kenya. Such losses have both economic and environmental implications[98] and are an indication of inefficiency in the food distribution system. Moreover, poor disposal of waste food commodities is hazardous to livestock and human health.

Land tenure and property rights issues. Where land rights and tenure are unclear or insecure, indiscriminate and unsustainable use of natural resources is likely. The decline of authority of traditional tenure systems in Kenya has led to increased cases of land-rights conflicts between

91 Ochieng, J., Kirimi, L., & Mathenge, M. 2016. Effects of climate variability and change on agricultural production: The case of small scale farmers in Kenya. Wageningen Journal of Life Sciences. *(http://www.sciencedirect.com/science/article/pii/S1573521416300057)*

92 Process in which livestock contribute to methane gas emissions - a component of greenhouse gas - through digestive process. *http://www.climate-change-guide.com/enteric-fermentation-definition.html*

93 The Government has committed to reducing greenhouse gas emissions by 30 percent by 2030 if well supported by the international community in building emission-reduction capacity.

94 Mangale, Nesbert, Anne Muriuki, Angela Kathuku-Gitonga, and James Mutegi. 2016. Soil Fertility Management Book of Abstracts for Kenya. Kenya Soil Health Consortium.

95 Larsson, Miriam, and Kristina and Marstorp Röing de Nowina Håkan. 2012. "Soil Fertility Status and Striga Hermonthica Infestation Relationship due to Management Practices in Western Kenya." Faculty of Natural Resources and Agricultural Sciences > Dept. of Soil and Environment: 96. *http://stud.epsilon.slu.se/4488/.*

96 Example: Recent death of Fish in Lake Naivasha due to pollution. Eroded soil is washed into water bodies (lakes and streams) causing siltation thereby blocking waterways and contribute to frequent flooding.

97 Celine, Achieng, Peter Okoth, Ayub Macharia, and Samwel Otor. 2009. "Policy Framework for Utilization and Conservation of Below-Ground Biodiversity in Kenya."

98 Waste food represents a loss of economic resources and an environmental cost with no benefit through emitted greenhouse gases from production, transportation and decomposition.

communities. Improved collective security of tenure has the capacity to incentivize long-term investment in land and other natural resources and to promote efficient extraction of these resources. Moreover, the spike in indiscriminate sub-division and conversion of agricultural land for residential use, especially in high potential areas, threatens food production and sustainability.

Underlying factors

Conflict and instability. Conflicts displace people and disrupt livelihoods through destruction of support structures such as markets, transport infrastructure and social networks.[99] Prolonged displacement has multiple adverse consequences for agricultural production and food systems in general, including degraded resilience and loss of productive resources such as land and livestock, inadequate food supplies and malnutrition, or loss of opportunity to employ human labour due to overdependence on relief support.

Climate-influenced hunger may trigger conflicts as the affected population compete for natural resources such as pasture and water potentially leading to migration and displacement. While resource-based conflicts have historically taken in place in Kenya among the pastoral communities, the nature of conflicts has become more complex, including cross-border resource-based conflicts.

Inadequate investment in disaster risk reduction. Support from the international community is often more focused on humanitarian assistance to alleviate the immediate effects of shocks, while resources dedicated to long-term efforts to build resilience and suitable early warning systems required for sustainable agricultural production have traditionally been more limited.[100]

Inadequate institutional and human resource capacity. Previously, agricultural support was vested to the national government but devolution of agricultural functions to county governments, coupled with changing environmental demands (e.g. more extreme weather events and populating growth) has created gaps in relevant skills. Inadequate competencies of county governments in the management of complex natural resources calls for rapid action to build capacity of county staff. In addition, delays in the disbursement of funds from national to county governments is hindering capacity development needed to meet the emerging county needs.

Inefficient commodity markets. In Kenya, functional commodity markets are important for stimulating and sustaining food production. However, globalization has opened new dynamics on domestic producer and consumers, whereby external market effects such as price transmission have negatively influenced the cost of commodities and overall competitiveness of local products. In addition, seasonal variations of local commodity markets often affect price stability, farmers' income and the purchasing power of food consumers.

Market failure. Inadequate access to output markets, financial services and affordable credit among smallholder producers results in market failure. Limited extension services, for example, have hindered smallholder farmers to comply with global sanitary and phytosanitary requirements, meaning they lose access to global agricultural market opportunities. Where the Government has responded with support programmes to address the cost of production through bulk supply of inputs such as fertilizers, potential small-scale beneficiaries have not always been able to take full advantage of such support.

Producer associations such as cooperatives present an opportunity for bulking outputs, collective procurement of inputs, and providing access to advisory services to enhance productivity. It is in these forums that market oriented and nutrition-sensitive agriculture can be easily promoted. Strong government engagement is a critical element of sustainable pro-smallholder agricultural market support. By

99 FAO. 2017. The State of Food Security and Nutrition in the World: Building Resilience for Peace and Food Security.

100 This pattern is driven by inadequate mainstreaming of Disaster Risk Reduction in the development planning and implementation strategy. Incorporating disaster risk reduction not only enhances the ability to manage disasters but also lowers the cost of investment.

engaging in coordination, capacity development, pro-smallholder procurement and building a strong enabling environment, governments can strengthen smallholder farmers' inclusion in formal markets.

The global Purchase for Progress (P4P) programme is a good example of government efforts to link farmers to markets. Box 2 describes how a successful P4P programme in Rwanda led to the Government scaling up the approach into a national common P4P programme.

Box 2: National Strategic Grain Reserve in Rwanda

The Government of Rwanda was one of the first to fully embrace the P4P concept, i.e. the systematic food procurement by an institutional buyer (in the first phase the World Food Programme) from national and, ideally, smallholder farmers. The pilot was launched in Rwanda in 2010, alongside government initiatives for increasing agricultural productivity, reducing post-harvest losses, consolidating fragmented land plots and strengthening smallholder farmers' cooperatives. In the first year, WFP bought US$1.2 million-worth of maize and beans from farmers' organizations in the eastern and northern provinces of the country.

Under the national common P4P, the Government uses its institutional purchasing power to support smallholders. Legislation commits the National Strategic Reserve and other public institutions, such as schools, hospitals and prisons, to procure up to 40 percent of their staple grain requirements directly from smallholder farmers' cooperatives.

Between 2011 and 2014, the Government of Rwanda purchased commodities worth US$4 million (10,000 mt) for the National Strategic Grain Reserve from common P4P cooperative unions. Under the common P4P, the Government advocates for increased private sector involvement in agricultural development. Agro-dealers and large trading companies have distributed fertilizer, credit and training to smallholder farmers, and coordinated the country-wide collection of smallholders' maize for delivery to the National Strategic Reserve.

Laxity in setting up regulations and enforcing policies within counties that seek to promote sustainable use of natural resources. Several relevant national strategies have yet to be mainstreamed in county governments' agendas. Sustainable use of natural resources is usually multi-dimensional and requires participation of different levels of government and other actors. Following devolution in 2010 and the redistribution of functions between national and county governments, increased bureaucracy and slow/long communication channels between the two levels of government have exacerbated duplication of efforts and reduced synergies.

Loss of forests and water catchment areas. Kenya's population is growing at 2.9 percent per year, more than 1 million people, increasing the competition between humans and wildlife for natural resources. This is manifesting itself in the rapid expansion in demand for agricultural land and increasing road and industrial infrastructure, resulting in the loss of forests, wetlands and water catchment towers (such as the Aberdares ranges, Mau forest complex, Cheranganyi Hills, and Mount Elgon and Mount Kenya forests. Loss of forest and water catchment areas is exacerbated by illegal logging and charcoal burning, which are driven by poverty and limited understanding of the benefits of conserving natural resources. The impacts of this include soil erosion and siltation of lakes and dams and consequently low agricultural production as well as water and electricity shortages.

Inadequacies in research and development for improved sustainability of agricultural production. Limited attention is given to the conservation of indigenous methods and no adequate framework for integrating local knowledge with modern technologies. In addition, a bias in agricultural research, extension and development, with minimal attention to sustainable use of natural resources, has arisen as a result of over-reliance on commercial research funds. Data is inaccessible or unreliable and comes from multiple sources that are contradictory and of poor quality. An integrated database on agricultural management is required given the multi-sectoral nature of sustainable food production.

▶ Target 2.5

Maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed by 2020

2.5.1 Description of genetic diversity and its importance in Kenya and links of target 2.5 with other sustainable development goals

Globally, food production systems are faced with great challenges to meet divergent socio-economic needs, including the rising food consumption demand. This calls for improved breeding and agronomic practices to produce highly adaptable germplasm for better quality and quantity of food within the available arable land using low fertilizer inputs (Mark and Peter, 2010). In addition, the enrichment of the existent gene pool through molecular analysis of favourable traits, phenotyping and genotyping of germplasm collection and development of protocols and strategies to allow introgression of multiple traits will ensure sustainable agriculture characterized by increased and stable production amidst the changing conditions (Feuillet *et al.*, 2008).

The genetic resources of plants and animals are an invaluable asset to humans and are key to increasing food security and meeting human and environmental needs. Kenya is a rich source of genetic diversity, the conservation and utilization of which can contribute significantly to enhanced and sustained economic growth. Plant genetic resources are the biological basis of the country's food security and directly or indirectly support the livelihoods of the Kenyan people. They include the diverse genetic material contained in traditional crop varieties and modern cultivars grown by farmers as well as crop wild relatives and other wild plant species that are used as food, medicine, essential oils, fodder and forage, timber and fuel wood, among others. Kenyan people derive most of their food, medicinal and industrial products from both wild and domesticated components of plant genetic resources. As genetic diversity erodes, capacity to maintain and enhance the productivity of crops, livestock, fishery and forests decreases along with the ability to respond to changing conditions.

In Kenya, as new varieties of commercial crops are embraced, traditional ones become obsolete. This erosion of crop genetic diversity poses a serious threat to food supplies. In addition, new varieties may achieve greater yields, but are often also dependent on additional, high-cost inputs, and may be less adapted to drought-prone conditions. At the same time, there is need to enhance smallholder farmers' access to genetic diversity.

The genetic diversity of farm animals is lower than of crop plant species, but this diversity is valuable and worth conserving. The greatest threat to domestic animal diversity is the highly homogenized nature of modern livestock production. However, if the genetic diversity found in native livestock breeds is not maintained, this may directly affect food security:

native livestock breeds are often disease resistant and better able to adapt to harsh conditions compared to modern breeds.

Well-managed forest ecosystems can improve food security and nutrition, while increasing income and job opportunities and providing a habitat for multiple species. The sustainable use of forests is therefore an inherent element of ecosystem protection and provides lasting genetic conservation of trees, plants and animals. However, in Kenya, forest resources are rapidly declining: forests are depleted due to increasing human demand for fuel wood and land for agriculture and other uses; and the genetic basis of tree species is becoming narrower as a result of commercial forestry.

2.5.2 *Current status and trends of genetic diversity conservation in Kenya*

Kenya has established a national gene bank, which conserves close to 50,000 accessions comprising about 2,000 plant species. The gene bank also houses the global repository of sesame, serves as a duplicate repository of African sorghum, millet and pigeon pea, and holds 10 plant species that are both new to conservation and to science. Capacity-building efforts have focused on community support, information generation and awareness raising, policy, outreach and training of technical staff. In addition to the gene bank, other ex situ[101] conservation efforts include farmer/community seed banks and private sector (for example seed companies) gene banks/reference collections.

2.5.3 *Factors Affecting the Conservation of Genetic Resources*

Conservation of genetic resources faces the following main challenges: limited funding of activities aiming at the conservation of genetic resources; lack of appreciation of genetic resources at regional and national level; limited capacity of smallholder farmers to understand and appreciate the genetic resources; low appreciation of the role of plant genetic resources in climate change adaptation and economic development; low appreciation of the role of genetic resources to food and nutritional security, feed resources, and environmental health; and limited documentation of some existing traditional varieties and their nutritional and medicinal value.

Other challenges include lack of incentives for farmers to conserve genetic resources; lack of incentives for scientist to release their varieties to the gene bank; limited implementation of the policy frameworks; uncollected genetic material; lack of coordination of institutions with overlapping mandates leading to conflicts and duplication; unsustainable use of genetic resources and of the ecosystems supporting them leading to genetic erosion; lack of structures or platforms for knowledge sharing; low infrastructure and human resource capacities; and limited collection and characterization of animal genetic resources.

▶ Target 2 (a)

Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

Kenya has good potential for boosting agricultural productivity, value-addition and sustainability. Increased investment in agriculture and rural development is key for combating food insecurity and for stimulating broader economic growth, prosperity and stability. Agricultural investment can also help contain upward pressures on food prices in a context of rising land and water scarcity, thereby enhancing food security.

101 *Ex situ* conservation encompasses the conservation of plants and animals outside their natural habitat.

However, at present, investments in (especially small-scale) agriculture are considered risky by the formal banking sector, and this limits the supply of both capital investment and credit to the producers. In fact, the sector faces significant risks related to weather, disease or markets (such as price fluctuations), the management of which require effective instruments to ensure agricultural investors a more stable income and a predictable environment favourable to investment.

Reducing and managing such risks is thus crucial for stimulating increased investments in agriculture and related fields, and for promoting better and more affordable access to credit for producers. At present, the resilience of the agricultural sector and its capacity to prepare for, respond to and cope with man-made or natural disasters such as conflicts and insecurities, drought, floods, diseases and pests, is low, contributing to the sector's and farmers' vulnerability. This is partially caused by the poor integration of risks into the agricultural sector planning and development programmes.

However, the Ministry of Agriculture and Irrigation is implementing an agricultural insurance programme with the aim of i) providing a policy framework for the management of agricultural production risks among producers, ii) increasing productivity in agriculture through improved access to credit and higher yielding technology and iii) supporting the transition from subsistence to commercially oriented farming with respect to both crops and livestock. A comprehensive framework has been developed to support smallholder farmers to access agriculture insurance under the financial sector. The framework targets 31 counties for crops and 14 ASAL counties for livestock. As the sector develops and implements MTP III, it will have to identify, assess and prioritize the principal risks it may face. In addition, up-to-date data, especially on climate, weather and production, needs to be gathered to support and inform the analysis of risks.

▶ Target 2 (b)

Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round

Trade in agricultural inputs and produce is an important activity for generating income and employment as well as promoting food security. Opening up to transparent and predictable agricultural trade policies improves the efficiency of resource allocations both domestically and across borders, thus facilitating economies of scale, boosting productivity and rates of return on investment and fostering food security. Indeed, trade contributes to higher economic growth, while trade barriers limit development.

In view of the limited size of the domestic market, Kenya has to take advantage of the opportunities presented by globalization to achieve significant growth and development. Kenya is signatory to various trade protocols and agreements within the East African Community, the Inter-Governmental Authority on Development, the Common Market for Eastern and Southern Africa, the World Trade Organization and the European Union. These agreements, if well applied, would bring benefits to Kenyan farmers and producers, provided that they increase their global competitiveness.

In addition, due to the limited arable land area, the only way of assuring food security is to access global food supplies. To ease the export and import of commodities in the regional markets, there is need to progressively remove barriers to trade, including the protection that is currently provided to maize, rice and sugar farmers. This will substantially reduce the uncertainties and transaction costs faced by traders and provide a clear signal to the private sector to

plan production, processing and marketing for external markets, instead of producing solely for subsistence and internal markets. However, opening up of markets needs to be undertaken in a phased approach to mitigate against an influx of cheap imports that will negatively affect the agricultural sector and, therefore, there is need protect the farmers until such a time they are able to be globally competitive.

With respect to internal trade, Kenya faces certain challenges that include costly and inadequate infrastructure such as poor roads and railways; high port and road charges and tariffs; slow communication systems; high cost of doing business (too many licenses and regulations); high and un-harmonized levies; and inadequate infrastructure (for example, safe storage) linked to markets and trade. These bottlenecks impede the flow of goods, services, and market information. In the case of livestock trade, lack of cattle holding grounds and interference with stock routes has led to limited access to domestic markets.

Furthermore, the promotion of agricultural activities will facilitate domestic and foreign investments in the sector, which will help to increase existing market shares as well as create opportunities for new markets.

▶ Target 2 (c)

Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

Food commodity futures markets reduce some of the risks faced by producers in the agriculture sector by trading contracts for many agricultural products, including maize, cotton, pigs, cattle, soybeans, sugar, and horticulture. Efficient commodity markets can allocate capital to innovative and high return investment projects of both large and small agricultural investors, thus increasing revenues and generating economic activities. However, agricultural markets in Kenya are under-developed and few farmers, especially poor smallholder farmers, understand the importance of commodity markets.

Commodity markets in Kenya presently consist of the Mombasa Tea Auction and the Nairobi Coffee Exchange. These markets operate as private clubs, and information on prices achieved do not reach farmers due to the opaque marketing systems that characterise both markets.

Kenya Agricultural Commodity Exchange is a private sector firm, which was primarily set up as an information service to enhance price discovery as well as a spot exchange in order to increase the efficiency of agricultural markets, targeting smallholder farmers and other small-scale agribusinesses. Futures contracts are not traded on the Kenya Agricultural Commodity Exchange.

In addition, there is need to fast track the warehouse receipt system bill of 2015 in order to provide a legal framework for the development and regulation of a warehouse receipt system for agricultural commodities and the establishment of the warehouse receipt system council. The warehouse receipt systems will allow agricultural producers to access credit by borrowing against receipts, enable producers to delay the sale of their products until after harvest, to a moment when prices are generally more favourable (contribute to stabilizing commodity price volatility); help reduce post-harvest losses and improve product quality, and provide the Government with timely and accurate information about the aggregate stock of stored agricultural commodities in the country.

The only real commodity exchange market accessible to Kenya is the East Africa Exchange which is a privately funded regional, agricultural commodities exchange based in Kigali, Rwanda. The primary objective of the East Africa Exchange is to help farmers and agricultural producers to obtain fair prices for their goods and merchandise, and to access reasonable funding for their businesses. The East Africa Exchange trades in maize and beans, and plans to expand into coffee, tea and rice.

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The Capital Market Authority Master Plan 2014–2023 stipulates the need for more open, efficient and adequately regulated commodity markets in Kenya, covering a wider range of products. The country is in the process of establishing a commodity spot and derivatives markets in agriculture, energy and minerals/ metals. A cabinet memorandum recommending that the Capital Market Authority oversee spot commodity exchanges has been prepared and is awaiting adoption to inform the submission of necessary statutory amendments to the Capital Markets Act.

All the above targets are linked to SDG 16 (promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels) as well as SDG 17 (strengthen the means of implementation and revitalize the global partnership for sustainable development). Good governance and the rule of law are prerequisites for any sound and sustainable development. The rule of law is crucial to reducing risks of investments and promoting better functioning food systems. At the same time, strong partnerships are required to effectively capitalize on the many opportunities Kenya has to ensure food security. Such partnerships include national and county governments, domestic and international private sector, civil society, communities, and development partners.

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National Response Priorities and Gaps for Achieving SDG 2

Part 3

National Response Priorities and Gaps for Achieving SDG 2

This section presents an overview and assessment of Kenya's national policy responses for achieving food security, ending malnutrition and ensuring sustainable food production systems. The section also considers the current gaps in the national response to food and nutrition security, basing the analysis around policy frameworks, accountable institutions, programme design and the role of non-government actors. Table 3 provides an overview of the national policies put in place since 2003 to address sustainable development, food and nutrition insecurity and sustainable agricultural productivity. The strategies and programmes under these policies are also highlighted, along with their objectives, success and gaps. Not all of these policies have been implemented, as outlined further in section 3.1.1.

With the exception of specific nutrition and social protection policies, many of the policies related to food security aimed to increase agricultural productivity and income, especially among smallholders.

The key areas of policy concern included emphasis on irrigation to reduce over-reliance on rain-fed agriculture in the face of limited high potential agricultural land, encouraging diversification into non-traditional agricultural commodities and value addition to reduce vulnerability, encouraging the private-sector-to lead development of the sector; and ensuring environmental sustainability.

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Table 3 *Selected policies to improve agricultural production and improve nutrition and food security: 2003 to present*

Policies	Programmes/Projects	Objectives	Sector(s)	Opportunity and Gaps	Implementation status
Sustained and inclusive development					
Economic Recovery Strategy (2003–2007)	1. Several economic stimulus projects	■ Make agriculture the leading productive sector for economic recovery. ■ Revive agricultural institutions. ■ Invest in agricultural research and extension.	Across all ministries	■ Lacked continuity and was discontinued after coalition government collapsed	Implemented but closed in 2007
Kenya Vision 2030 (2008–2030)	1. Fertilizer cost reduction. 2. Disease free zones for movement of livestock. 3. Irrigation of ASALs. 4. Agricultural credit and financial services. 5. Agricultural programme for schools.	■ Transform smallholder agriculture from subsistence to an innovative, commercially oriented and modern agricultural sector. ■ Increase acreage under irrigation. ■ Mechanize agricultural production. ■ Revive cooperatives and farmers unions. ■ Subsidize farm inputs to raise productivity.	Agriculture, Livestock and Fisheries under the "Economic Pillar" of Vision 2030	■ Provides long-term country development agenda for partners to support. ■ Limited linkages with SDGs especially in agriculture, livestock and fisheries.	Ongoing
County Integrated Development Plans (2018–2022)	1. Various projects and programmes driven by individual county needs	■ Guide development process in counties. ■ Enhance linkages between policy, planning and budgeting. ■ Provide guidelines in budgeting, project funding, and monitoring and evaluation of all projects	Across all counties	■ Provides comprehensive planning. ■ Enhances country-level implementation. ■ First CIDPs were rushed in development. ■ Implementation was low.	Developed and are being implemented

Policies	Programmes/Projects	Objectives	Sector(s)	Opportunity and Gaps	Implementation status
Agriculture growth and transformation by youth					
Kenya Youth Agribusiness Strategy (2017–2021)	1. Transform mind-set and perceptions of youth towards agribusiness. 2. Access to sustainable use of land and affordable and friendly financial services. 3. Access to affordable suitable output markets and provide new opportunities in agriculture and its value chains.	■ Position youth at forefront of agricultural growth and transformation. ■ Provide new opportunities for youth in agriculture and its value chains	Agriculture, Livestock and Fisheries	■ Leverage on youth bulge in transforming agriculture. ■ Has potential to increase employment. ■ Encourage and support agribusiness. ■ There is need to develop a policy.	Being implemented
Food security, employment, enhanced incomes, and institutional reforms					
Strategy for Revitalizing Agriculture (2004)	1. Complement the Economic Recovery Strategy in agriculture 2. Emphasizes Public Private Partnerships	■ Make agriculture profitable, commercial and competitive. ■ Create high quality gainful employment. ■ Shift from subsistence to profitable and commercially oriented agriculture.	Agriculture	■ Improvement in value-chain by involving private sector. ■ Promotes sustainability. ■ Limited stakeholder consultations.	Closed
Agricultural Sector Development Strategy (2010–2020)	1. Progressive agricultural growth and development. 2. Realistic policies and institutional change.	■ Reduce unemployment ■ Reduce food insecurity ■ Reform institutions	Agriculture, Livestock and Fisheries	■ Provides road-map up to 2020 ■ Provides opportunity to strengthen institutions ■ Limited consultations among ministries and counties ■ Not aligned to devolution	Ongoing
National Agricultural Sector Extension Policy (2005)	1. Alternative private agricultural extension system.	■ Evaluate agricultural extension trends. ■ Analyse farmers' access to extension services. ■ Evaluate various types of public and private extension services.	Agriculture	■ Recognition of private sector as a key player in agriculture. ■ Limited private sector strength in extension services.	Overtaken by recent policies

Policies	Programmes/Projects	Objectives	Sector(s)	Opportunity and Gaps	Implementation status
Food security and nutrition					
National Food and Nutrition Security (2011) (2017–2020)	1. Covers multiple dimensions of food security and nutrition improvement. 2. Addresses chronic, poverty-based food insecurity and malnutrition.	■ Achieve national food and nutrition security. ■ Ensure that all enjoy high quality food in sufficient quantity and quality. ■ Protect vulnerable populations. ■ Develop capacity for early warning and emergency management.	Agriculture, Livestock, Fisheries and Health	■ Provides plan in addressing food and nutrition security ■ Supports SDG 2 ■ First done 2011 before devolution, but there were no consultations with counties after 2013	Ongoing
Kenya Nutrition Action Plan (2012–2017)	1. Promotion of exclusive breastfeeding and timely complementary feeding. 2. Iron folate, vitamin A and zinc supplementation. 3. Promotion of hand washing. 4. Deworming. 5. Food fortification. 6. Management of moderate and severe acute malnutrition.	■ Realization of optimal nutrition in Kenya. ■ Provide framework for coordinated implementation of nutrition intervention activities by government and stakeholders.	Health	■ Complements improved nutrition under SDG 2. ■ Did not include such sectors as agriculture, livestock and fisheries.	Being implemented
National School Health Policy and Guidelines (2009)	1. Address values and life skills; gender issues; child rights, protection and responsibilities; water, sanitation and hygiene; nutrition; disease prevention and control; special needs, disabilities and rehabilitation; school infrastructure and environmental safety.	■ Improve health and education standards of school children. ■ Promote overall health, nutrition and education of children in school and within the community.	Education and Health	■ Recognizes importance of early development of the child. ■ Supports SDG 3 and SDG 4. ■ Excluded important sectors, such as agriculture.	Overtaken by recent policies and guidelines
National Home Grown School Meals Programme (2009 to date)	1. Providing cash to schools for local procurement of food for school meals.	■ Education (improved enrolment, retention, participation and learning). ■ Improved nutrition (and improved awareness). ■ Social protection (increasing food security, reducing short term hunger).	Education, Health and Social Protection	■ Offers multi-sectoral approach and addresses various SDGs. ■ Mainly lack of consistent and sufficient funding. ■ Dependence on traders. ■ Poorly linked to local smallholder production.	Ongoing but scaled down due to limited funds

Policies	Programmes/Projects	Objectives	Sector(s)	Opportunity and Gaps	Implementation status
Increase in meat and milk production, employment and enhanced income					
National Livestock Policy (2008)	1. Genetic resources, nutrition, inputs, diseases and pests, marketing, food safety, veterinary pharmaceuticals, quality assurance, research and extension	■ Strengthen dairy training institute, meat commission and dairy board. ■ Establish a national livestock insurance scheme. ■ Promote value addition and increase exports ■ Pursue livestock farming at subsistence and commercial levels.	Livestock	■ Did not incorporate livestock insurance ■ There is need to develop another policy to incorporate developments in livestock sector	Overtaken by recent policies
Kenya Cooperative Development Policy (2008)	1. Expand economic space for sustainable cooperative growth. 2. Reduce strict state supervision of cooperatives to support liberalization.	■ Restructure, strengthen and transform cooperatives ■ Create wealth and employment through private business ventures	Cooperative	■ Had limited emphasis on education and training in cooperatives. ■ There is an urgent need to develop another policy to due to the importance of cooperatives.	New policies being developed
Sustained blue economy					
Fisheries Management and Development (2016)	1. Formation of council, service, marketing authority, research and development, and fish levy trust fund for sustainable fisheries	■ Provide conservation, management and development of fisheries and other aquatic resources. ■ Enhance livelihood of fishing communities. ■ Implement obligations under international law.	Fisheries	■ Addresses SDG 14. ■ Provides another source of livelihoods for some communities. ■ Need for linkage with other sectors. ■ Policy on blue economy needs to be updated.	Ongoing

Policies	Programmes/Projects	Objectives	Sector(s)	Opportunity and Gaps	Implementation status
Continued growth and competitive pricing in horticulture					
National Horticulture (2012)	1. Provided opportunity for ensuring sustained growth and global competitiveness.	■ Enhance production, food safety and post-harvest handling facilities. ■ Develop physical market infrastructure. ■ Exploit agro-ecological conditions by focusing on under- or unexploited regions.	Horticulture, Agriculture and Trade	■ Develop a policy that includes a linkage between horticulture and food security. ■ Address malnutrition in horticulture growing areas. ■ There is still limited say in world markets prices.	Policy in the process of being developed
Sustained use and management of forests					
Forest Policy (2014)	1. Improved forest governance, resource allocation, partnerships and collaboration with state and non-state actors. 2. Enables sector contribute in meeting country's growth and wealth creation in a sustainable environment. 3. Increase and maintain forests and trees.	■ Mainstream forest conservation and management into national land use systems. ■ Oversee implementation of national policies by county governments in implementing national policies. ■ Deliver forest extension services to communities, farmers and private land owners. ■ Strengthen community forestry associations, and introduce benefit-sharing arrangements. ■ Introduce chain-of-custody system for timber and wood products.	Forestry	■ Addresses SDG 13. ■ Provides alternative form of livelihood. ■ Lacks buy-in especially from indigenous communities who live in forests.	New policy being developed
Social safety net for vulnerable populations					
National Social Protection Policy (2011)	1. Consolidated social protection fund. 2. Cash transfer programme.	■ Promotes synergy and minimizes duplication activities across ministries and non-state actors. ■ Ensure vulnerable people have a financial cushion to help lift them out of poverty.	Social Protection	■ Creates wealth by promoting efficient labour markets. ■ Offers a safety net for the vulnerable. ■ Lacks a graduation model. ■ Limited coordination with other sectors' initiatives.	Being implemented

Policies	Programmes/Projects	Objectives	Sector(s)	Opportunity and Gaps	Implementation status
Agriculture – climate change resilience and drought management					
National Climate Change Response Strategy (2009 and 2010)	1. Climate change action plan for agriculture. 2. Climate change mainstreamed in all development plans for agriculture.	■ Make agriculture climate-resilient. ■ Protect national resource base. ■ Research and disseminate superior drought-tolerant, pest- and disease-resistant crops.	Agriculture and Environment	■ Addresses SDG 13 but limited. ■ Offers opportunity to mitigate against droughts, floods and other disasters. ■ Need for another policy.	Closed
National Irrigation Policy and Management (2017)	1. Managing seven national irrigation schemes. 2. New development and rehabilitation of about 120 irrigation projects spread over the country.	■ Establish legal framework for irrigation development. ■ Develop land reclamation policy and bill.	Water, Irrigation and Environment	■ Attempts to address over-reliance on rainwater in agriculture. ■ Offers opportunity to mitigate against droughts. ■ Lacks an integrated approach and commitment to end over-reliance on rainwater.	Finalized and is key for food and nutrition security under 'Big Four'
Ending Drought Emergencies Framework (2015)	1. National drought and disaster contingency fund. 2. Integrated drought early warning system. 3. Integrated knowledge management system for drought.	■ Implement and scale-up a hunger safety net programme. ■ Create and coordinate close working relationship among national and county governments, development partners, private sector and non-state actors. ■ Enhance monitoring and evaluation.	Agriculture, Livestock and ASALs	■ Reduces exposure to drought. ■ Provides collaborative and effective action by all players. ■ Ensures a supportive enabling environment. ■ Lacks an integrated approach and commitment to ending drought emergencies.	Being implemented

3.1 Gaps in the National Response to Food and Nutrition Insecurity and Sustainable Agriculture

3.1.1 Policy and Regulatory Framework

Despite the plethora of policies and regulations in place to support food and nutrition security in Kenya, many policy and regulatory shortcomings exist.

Gaps in policy and regulation

One specific policy gap in Kenya in terms of food security is in the **Food Security Bill** of 2014, which is still pending approval by the National Assembly. The bill emphasizes the need for state institutions to reach out to vulnerable groups through food distribution programmes. In this, the bill duplicates the Social Assistance Act of 2013 and, to some extent, of the Social Protection Policy of 2011, mainly targeting the same persons for social assistance with similar treatment interventions. The bill should rather aim to complement social assistance with a view to addressing the root causes of food and nutrition security. The bill could be more effective if it were to focus more on how chronically food insecure communities, households and individuals can be empowered to feed themselves rather than relying on humanitarian assistance.

Public response to food security crises due to production or market shocks, such as the introduction of unsustainable subsidies and incentives, has generally been unsound. Moreover, ineffective mechanisms have been put in place to deal with seasonal surpluses during bumper harvests, which could have been stored and used during periods of food crisis.

Policies on farmers' organizations and cooperatives are absent and their revival is essential, having been key from the 1960s up to the mid-1980s.

Many policies focus on food quantity rather than quality, overlooking issues of nutrition.

The constitution adopts a people-centred and human rights-based approach to governance. However, the enabling legal frameworks remain inadequate to institutionalize gender equality and women's empowerment at county level.

Inadequate regulation to enforce policies

Within the **social protection sector**, it is clear that the current laws are not sufficient to ensure clear cooperation and complementarity between sectors at the same level and between national and county governments.

In the **livestock subsector**, the legal and policy framework is inadequate. For example, there is no beef policy in the country and county governments have not been included in trade negotiations.

There is also a **lack of a legal and institutional framework on transboundary fishing in waterbodies** such as Lake Turkana and Lake Victoria.

Regulations concerning protection of genetic resources need to be finalized and gazetted and the legislative framework of the protection of genetic resources, including the certification and quality control of seeds, needs to be harmonized with other frameworks at national and international level. In addition, there is need to address the policy/regulation gaps on GMOs, research and use of appropriate technology.

Weak implementation of policies and regulatory frameworks

Even where policy and other instruments exist, implementation of these instruments is generally weak. This can be clearly seen in the **Food and Nutrition Policy (2012)** and the **National School Health Policy (2009)**, which lacked integration and coordination between health, food and nutrition.

Within Kenya, for policy instruments to be implemented, they often need to be supported and promoted by a **high-level champion**. This high-level engagement and leadership has not yet been displayed for food and nutrition security.

Many of the relevant instruments have been developed within specific sectors and often lack the **cross-sectoral integration** required for efficient and effective implementation. There is little alignment between different sector policies, for example, with respect to crop agriculture, health, and rural development. While the country is moving towards evidence-based policy formulation, policies and other instruments under formulation are still not assessed and developed systematically with cross-sectoral impact in mind.

County governments are key to effective implementation of the majority of the food and nutrition policy instruments. Devolution has offered crucial new opportunities for them to undertake this role from a strong position. However, to date, policy formulation has insufficiently encompassed both national and government priorities and interests from the outset, **limiting county ownership for implementation.**

County priorities are guided by five-year CIDPs, which have to be aligned with overall national development priorities. Although over 90 percent of agricultural sector functions are now devolved to **county governments**, **overlaps with national priorities** still exist due to a lack of alignment of extant national policies after the devolution. This has resulted in multiplication of efforts and inefficiency in public service delivery.

Regulation is lacking to ensure good coordination both across sectors and between national and county governments.

Many **policy instruments in food and nutrition security do not include quantifiable targets and milestones**, which would enable their progress to be tracked and ensure clarity of their vision and guide more realistic planning. The Economic Recovery Strategy 2003–2007 showed that this can be done and be highly successful.

Mandated institutions are crucial for implementation of policies and regulations, and clear institutional frameworks are required to coordinate all the elements of implementation. However, both **frameworks and institutions are presently weak and badly delineated** across both county and national governments.

The 2010 Constitution devolved a considerable part of government responsibilities to county governments. This has risked weakening existing institutions and coordination mechanisms where responsibilities and priorities have changed without concomitant institutional changes. **Limited linkages between county and national functions pose challenges for sharing information**, limiting implementation and slowing the development of county staff capacities to deliver on their mandate. It is clear that county institutions and coordination mechanisms need to be strengthened if they are to undertake policy implementation and development effectively.

Within the national government, different sectors work, to a large extent, independently. While efforts are being put in place for better coordination, particularly between the ministries of health, agriculture and education, closer collaboration is required among these institutions and with other stakeholders. At present, **multi-sectoral collaboration and integration between both national and county governments remains weak** and coordination and cooperation within these levels of government needs to be sufficiently structured within an institutional framework.

Similarly, in terms of maintaining genetic diversity, there is a shortage of scientific staff, low retention and lack of succession planning of trained staff with specialized training in various core disciplines on gene banking, although some colleges in Kenya offering courses in animal genetics.

Facilities for the control and eradication of **transboundary pest and diseases** linked to agricultural trade are lacking or insufficient, as is quality assurance of livestock products. Moreover, farmers and agribusinesses do not have sufficient and information support to access international markets.

3.1.3 Sustainable Financial Resources

Current sources of financial support for implementing food and nutrition security instruments come from both national and county governments as well as development partners and NGOs.

However, **implementation of many of the existing policies, strategies and programmes is suffering from insufficient and unpredictable allocation of funds**. In agriculture, both national and county governments are consistently allocating budgets to the sector that remain far below the 10 percent of the national budget recommended by the Maputo Declaration.[102] These budget levels are insufficient to fully and effectively implement policies and strategies, establish and maintain good quality systems and services, and ensure close monitoring and adequate and timely gathering of reliable information. In fact, national allocations have been decreasing, as shown in Figure 19. It is unclear whether this trend reflects lack of prioritization of the development of agriculture despite the recognized importance of the sector for national development and household food and nutrition security.

With respect to nutrition, national funding by the Ministry of Health is currently limited as the Nutrition Investment Plan was not included in the Government's MTP II and so was unable to influence government and partner fund allocation. Moreover, many county governments have no budget for nutrition, and where government contributions do exist they mainly focus on food procurement for emergency response. Other nutrition activities tend to be funded by development partners.

Lack of funding is also exemplified in National Home Grown School Meals Programme, where the Government has committed to fully taking this over from donors but the funding level for the programme is still below 50 percent of the total requirements.

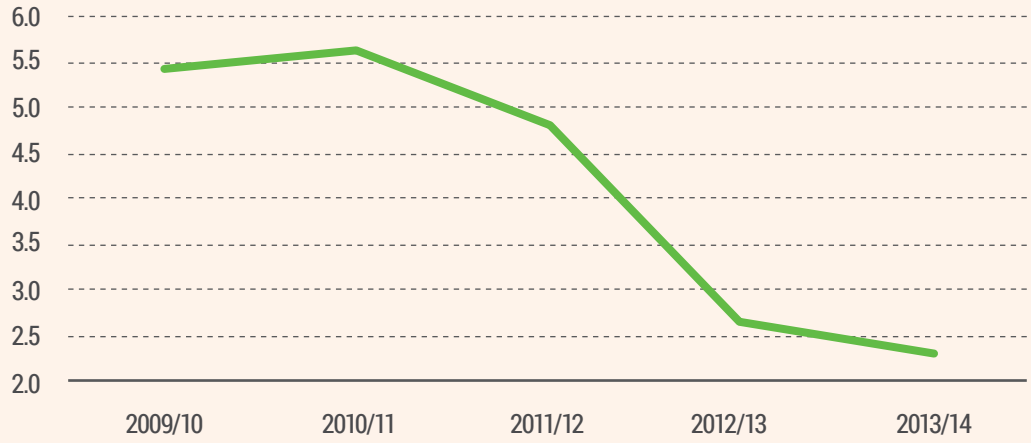
For the Government to expand school feeding to all primary schools in Kenya, as envisaged in the new national school meals and nutrition strategy (2017–2022) a sustainable, stable and regular funding source will be needed to be enshrined in the Government's budget.

The exposure of Kenyans to risk without adequate safety nets is a major impediment to building a more productive workforce and economy. Despite significant progress, the level of investment in social protection (coverage and transfers) is insufficient to realize optimum economic, social and political benefits.

Additional resources also need to be mobilized through public-private partnerships, cooperative societies, development partners and NGOs, who currently mainly support capacity strengthening and extension services.

102 At the 2003 Second Ordinary Assembly of the AU in Maputo, African Heads of State and Government endorsed the "Maputo Declaration on Agriculture and Food Security in Africa" (Assembly/AU/Decl. 7(II)). The Declaration includes the "commitment to the allocation of at least 10 percent of national budgetary resources to agriculture and rural development policy implementation within five years.

Figure 19 *Percentage allocation of agriculture in the national budget 2009/10–2013/14*



Source: *Njagi et al., 2014*

In addition to a deficit in the overall levels of dedicated resources, additional gaps in terms of coordinating and planning funding hinder the attainment of food and nutrition security within Kenya. Separation of functions with respect to sector planning by the Ministry of Devolution and ASAL and the National Treasury often result in **funding decisions that do not fully correspond to development priorities**. The National Treasury needs to be involved in the discussion of cross-sectoral strategies and plans – and then provide the resources required for their implementation. When this does not happen there can be extensive delays, for example, with the agricultural bill, which was held for six months in the Treasury without being passed. A more strategic link between development planning, investment plans and fund allocation could improve this situation.

Historically, there has been a **lack of strategic investment planning** and linking of the agricultural sector with other sectors. Although this is beginning to change – for example, at the national level the relevant ministries for agriculture and social protection are embarking on joint plans. At the county level, there is still a large gap in this capacity.

The Government has adopted gender-responsive budgeting as a strategy for promoting gender equality and inclusion at both the national and county level.

The policy environment is unpredictable and this has led to a general inertia within the private sector to invest. Agricultural subsidies and risk financing can act as "productive safety nets" from a policy and programme perspective and can positively increase production. Political interests (both at national and county level) drive decisions on resource **allocation** (e.g. fertilizers and maize subsidies) and as a result, the level and timing of resource availability is highly unpredictable, which hampers well-planned and prepared implementation.

Expanding the social protection sector is essential if Vision 2030 is to be achieved. There is strong evidence that well-targeted resource allocation through social protection is a crucial investment and a core component of a successful economy. According to the Economic Survey 2017,[103] Kenya is making good progress in developing its social protection sector, with the social protection budget allocation having increased from KSh 2.6 billion in 2012/13 to KSh 15.3 billion in 2016/17 – an increase of over 450 percent. However, there is **little harmonization between national and county social protection programmes** (extent, transfer values, targeting and monitoring), which limits their efficacy of the programmes' implementation.

The insufficient budget allocation is compounded by governance issues in the form of **a lack of transparency and accountability**. Even when funds are allocated they are not necessarily used appropriately but are diverted to other public activities or lost through general "leakage". There is also variable commitment from partners, who may indicate that they will provide resources, but then often these may not materialize.

3.1.4 Programme Design and Implementation

Many nutrition, social protection and agricultural programmes **do not have baseline data to set targets for benchmarking** following their implementation. There is no county-specific or national data on food utilization/consumption and on the cost of nutritious diets, nor on the nutrition and micronutrient status of adolescents and the elderly. Similar, data on agricultural products, yields, and prices is scarce and unreliable and most of the existing programme indicators are established only at national level, and data are often only collected at 5-year intervals. Moreover, existing data is often not adequately integrated with indicators from other sectors, which has led to conflicting statistics between government departments as well as with the private sector. An integrated coherent and up-to-date database across all relevant government sectors is required.

Programmes often **lack a robust monitoring and evaluation framework**, making it difficult or impossible to assess the extent to which they achieve their targets and objectives. This hinders the identification of specific areas that require improvement as well as any understanding of the efficacy of the primary intervention. Where monitoring data is available, it is often conflicting and unreliable, coming from several sources that are not harmonized. Establishing simple, but efficient standing monitoring systems could help better assess developments and achievements. County-specific data is required for the implementation of county-specific activities for appropriate interventions.

Incorporating community priorities and needs into programme design is still greatly influenced by the political environment or limited to multi-sectoral approaches. Moreover, **capacity to implement multi-sectoral programmes is low**, particularly at county level, because of limited systems, tools and guidance, and technical quality of staff.

Extension services are insufficient, lack quality, and are not establishing the required link between research, policies and strategies on one hand, and farmers and producers on the other. There are only a few extension and veterinary officers in the country, and these often lack motivation.

3.1.5 The Role of the Private Sector and Non-State Actors

To sustain solutions with respect to food security, nutrition and sustainable agriculture, it is **crucial that private-sector and non-state actors complement and amplify the efforts of national and county governments**. However, while there are renewed efforts to encourage public-private-led development in the agriculture sector, the national guidelines for these partnerships and investment frameworks have not been disaggregated to the county level. Private sector and other non-state actors' efforts in food security, nutrition, and sustainable agriculture are limited and dispersed, and

103 Economic Survey 2017, table 3.3.

rarely integrated into or coordinated with CIDPs. Moreover, a well-functioning private sector requires strong functioning markets, including with respect to infrastructure and security, which are largely absent in the agricultural and nutrition sectors.

The potential of smallholder farmers is not sufficiently exploited for multiple reasons, including poverty, low capacity, insecure land rights, decades of dependency on humanitarian assistance, lack of access to adequate guidance and lack of access to affordable credit and risk management. Smallholder producers are often treated as a homogenous group; however, their profile and needs can differ significantly across areas, livelihood systems, and gender. Instruments aiming to strengthen them and provide greater market inclusion must take this into account.

Cooperative and farmer organizations can play a crucial role in increasing, improving and diversifying agricultural production if they are empowered, especially through the supply of adequate credit and savings products. However, governance issues caused their collapse in the past; there is now **a strong need to revitalize the cooperative sector**.

PHOTO:©WFP

Conclusion and Recommendations

Part 4

Conclusion and Recommendations

4.1 Conclusions

Kenya has the potential to increase food production and productivity to satisfy the current and future demand for food by the increasing population. In addition, agriculture, agribusiness and value-addition within agriculture have the potential to generate gainful employment for a large number of people, boosting household incomes from commodity, service and labour markets. Moreover, Kenya's social protection sector has the potential, if the current progress in providing those most in need with basic incomes is sustained and further intensified, to secure access to sufficient and adequate food for those who cannot not yet satisfy their calorific and nutritional needs by their own means.

However, improved food security, nutrition and a move towards more productive, sustainable agriculture, livestock, fisheries, and food systems face a number of key challenges: lack of implementation of regulatory and policy frameworks in agriculture and food safety, rapid population growth, poor national infrastructure and food storage facilities at all levels, low use of production-enhancing technologies, expensive inputs, and insufficient links between research and farming.

Other challenges include over-reliance on rain-fed agriculture; low value-addition; expensive and long transaction chains between farmers and consumers; and high cost of capital. In addition, the sector faces weak market structures and systems, including limited market and price information, trade facilities, multiple taxes, levies, and fees that discourage inter-county trade and business; limited human capital skills, especially within county governments; un-reliable, out-dated, uncoordinated data that is not disaggregated by county; and weak monitoring and evaluation systems.

For Kenya to achieve zero hunger, the country must move from "business as usual" to "business unusual". There is a more pressing need to look again at how food is produced, distributed, stored, value-added, processed and consumed. The decisions that governments, businesses and consumers make today will determine how and if Kenya can meet the demands of future generations. Moreover, this is happening at a time when the natural resources (land, soil, freshwater, biodiversity) that food production depends on are under growing stress and there is, therefore an increasing risk of a major food production shock.

However, there is significant potential for development. Data-enabled technologies are becoming more accessible and affordable, driving a revolution on how food systems operate, connecting supply chain partners and consumers in innovative ways, improving yields and communication, reducing resource use and waste, and opening the door to new food chain collaborations and partnerships.

There is urgent need to implement the many strategies and actions that have already been developed as well as address the plenitude of additional factors affecting food and nutrition security. Undeniably, there has been less implementation since independence in 1963 – the success of being food secure by 2030 will indeed be judged on the choices, actions and strategies that the Government will make towards transforming the whole of the agricultural sector (crops, livestock, fisheries and forestry) and Kenya's relationship with food. The agriculture sector must be ready to respond to current and future challenges and trends, and be able to reconcile the needs of the growing population with protecting and enhancing the natural environment.

4.2 Recommendations for National Response and Policy

The approach to addressing SDG 2 is fundamentally multi-sectoral. Strategies in addition to actions must therefore be crosscutting. Together with both county and national government stakeholders must support these recommendations and continue to participate in the dialogue over national development as well as advocate for a **high-level champion** for the achievement of Zero Hunger in Kenya by 2030.

4.2.1 General Recommendations

The Government and partners should:

1. **Implement existing policies and strategies** in agriculture, food security and nutrition by enacting legislation required to enforce policy implementation and by sensitizing members of the National Assembly and Senate, improving advocacy and increasing pressure from the Council of Governors and from non-state actors and e**nsuring that pending relevant legislation** is passed into law as a matter of priority.

2. **Harmonize national priorities in agriculture, nutrition and food security with the counties' integrated development plans** by complementing the present resource allocation to counties with additional, performance-based resources.

3. **Ensure that development priorities are fully resourced** by aligning them with investment plans and actual resource allocation through closer cooperation between the Ministry of Devolution and ASALs with the Ministry of the National Treasury and Planning, as well as and advocating for enough resources through sector hearings and Medium Term Expenditure Framework and Medium Term Plans.

4. **Develop a national master plan for food and nutrition security** through building political awareness on the adverse effects of malnutrition on welfare and on development prospects; raising general level of knowledge and awareness of the importance of good nutrition; enacting supportive policies and laws; and taking swift and decisive action to achieve and maintain food and nutrition security.

5. **Enhance investments in ASALs** in particular in relation to irrigation structures, such as dams and water pans, the production of meat, animal health services, infrastructure, and social amenities.

6. **Invest in both large- and small-scale irrigation projects through public-private partnerships**. This should include supporting community and smallholder farmers with low-cost small-scale irrigation projects.

7. **Secure reliable and timely data, disaggregated by gender and by county, on all indicators for SDG 2** and ensure this is accessible to all stakeholders from a centralised data centre through development of county-specific economic surveys as well as enhancing capacity and provision of necessary equipment and systems at the county level.

8. **Address the double-burden of malnutrition**. Malnutrition should be treated as a national development priority and the supply of and the demand for diverse, safe and nutritious food should be integrated into the relevant sector policy, programme and strategy. In addition, Government should enforce existing regulations on food fortification through control measures and measures that aim at reducing the cost of fortified food and stimulate research into the potential of local (known and affordable) plant resources that can be used for large-scale fortification of food by the population, accompanied by awareness raising and skills training;

9. **Ensure that national and county staff have the capacity** to implement programmes in an efficient, effective, and transparent way. Develop systems, tools and guidance and effective monitoring and evaluation to ensure this. Monitor policy implementation and evaluate the outcomes and impact, including upgrading existing monitoring and evaluation systems and supporting counties in developing

data collection, analysis and systems, as well as reporting capacities for efficient and effective programme management.

10. **Improve intra-ministerial coordination within and between national and county governments.** Understand the gaps and overlaps in strategies and programmes between relevant government ministries by carrying out concise reviews of relevant policies, strategies, regulations and programmes. Ensure relevant ministries pro-actively seek cross-sector coordination as well as with the private sector and other non-state actors. Establish new and enhance current forums for close collaboration between national and county governments to ensure full county involvement in policy formulation and the development of relevant guidelines.

11. **Improve community engagement** and decision making in agriculture, nutrition and food production by providing means of community feedback for programmes (including a system of dealing with complaints and grievances), for example the introduction of a 'citizen scorecard'. Strengthen food and nutrition education at the community level and promote greater diversification of diets and healthy diets and lifestyles.

12. **Encourage private sector and non-state actors to respond to county and national government development policies and programmes**. For example, the private sector could invest in agro-processing and value addition, improving post-harvest technologies, developing and strengthening co-operatives, setting up and organizing farmers into producer and marketing groups/associations, improving market access for smallholders through better supply chain management, and effectively manage genetic resources. This could be done through creating an enabling environment such as supportive and inclusive regulatory changes to improve access to credit; land titling and leasehold reform; streamlining tax requirements; and facilitative law for public private partnerships.

13. **Educate the youth to the benefits of farming and agriculture** to improve their perceptions of agriculture. This could include through the re-introduction of 4K clubs in schools, emphasizing rural farming, sharing successful farming initiatives, Moreover, the Government could support implementation, review and development of policies that create an enabling environment for youth in agriculture and promote an integrated approach to address cross-cutting challenges such as gender disparities and cultural barriers.

14. **Ensure more gender representation in agriculture** by deliberate use of gender equality approaches in policy formulation and implementation guidelines as well as promoting sustainable inclusive participation and gender equity.

4.2.2 *Specific Recommendations*

The specific recommendations below are structured around the targets for SDG 2. These should be addressed by both county and national governments in conjunction with partners. Government and partners should:

Target 2.1 End hunger and ensure access of food by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round

1. Address poverty by accelerating the expansion of social protection through investment by the Government in a comprehensive, integrated and inclusive social protection system. This should include addressing gaps and weaknesses in current social protection and safety net programmes to ensure that the poor (rural and urban) and the vulnerable groups especially women, children and the elderly are supported while institutional coordination is improved and linking social protection and other public services – such as health, education, nutrition and agriculture. This will contribute to ensuring the right to adequate food for all.

2. Roll out the National School Meals and Nutrition Strategy (2017–2022) to ensure that all children enrolled in early childhood development centres and primary schools

are provided with a nutritious daily meal to enable them attend school and improve access to education. This can be achieved by regular provision of meals every school day throughout the school year; acknowledgement of nutrition and nutrition education as core components of school meals; and linking smallholder farmers with the demand for school meals by procuring directly from these suppliers where possible. However, this calls for national and county governments, communities and schools to have closely coordinated school meals initiatives.

3. Reduce and avoid conflicts among communities and users over access to resources through peace initiatives and providing more of the scarce resources within these communities, such as water pans, small dams and improved infrastructure.
4. Improve food security and nutrition of refugees and those affected by conflict through integrating humanitarian with development assistance.
5. Improve the national strategic food reserve to ensure food availability and guarantee buffer stocks of essential commodities to stabilize prices for optimal consumption and sustenance of nutrition security by buying more food during times of good harvest as well as building modern storage facilities in each county.
6. Build national capacities and systems for social protection, emergency preparedness and response and government-led food assistance programmes and nutrition services.
7. Recognize and reduce gender inequalities as key to achieving sustainable food security and nutrition by adopting gender equality approaches in policy formulation and promoting sustainable inclusive participation.
8. Improve national humanitarian response capacity by improving and expanding the shock responsiveness of social assistance schemes.

Target 2.2 End all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons

1. Support and promote varied, resilient and nutrition-sensitive agriculture and ensure that nutrition features as a core component of all national and county food security strategies.
2. Implement innovative and integrated cross-county and cross-sector strategies to address stagnant levels of acute malnutrition and low birth weight, along with micronutrient deficiencies and increasing levels of overweight and obesity.
3. Improve access to diverse, nutritious and safe food through safety nets that provide access to nutritious foods for poor and vulnerable women and their families, including school feeding.
4. Initiate research and data collection to clearly understand the differences between urban and rural food security and malnutrition to drive the appropriate interventions in each county.
5. Promote healthy dietary and water, sanitation and hygiene habits among the population (choice of food, composition, storage and cooking, water and sanitation), including best breastfeeding and complementary feeding practices for young children.
6. Enforce national food safety and quality regulation by implementing the law and taking severe measures against those breaking the law.

Target 2.3 **Double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment**

1. Coordinate management of water resources across counties to encourage smallholder farmers to improve their use of water resources, overcoming their reliance on rain-fed agriculture, through increased water harvesting, storage and irrigation, additionally securing better infiltration of water into the soil.
2. Support and promote modernization of smallholder agriculture production through i) increased public and private sector investments in improved food production systems, especially in efficient and stable supply chains; ii) assisting farmers to take up and better use technology, including in irrigation; and ii) enabling farmers to better use genetic plant and animal resources that can improve diets and support nutrition interventions.
3. Ensure better use of the land suitable for agriculture and livestock by clarifying land rights, zoning areas to protect suitable agricultural land against competing forms of land use and avoiding sub-division of agricultural land into unproductive plots.
4. Recognize and support women as key to achieving sustainable food security and nutrition through complementing interventions in food and nutrition with efforts to increase the interest and demand of target groups.
5. Engage and support youth in agriculture and agribusiness by addressing negative perceptions in this area. This can be achieved by improving opportunities for technical and higher education in agriculture, agribusiness and food processing. Moreover, increased engagement of youth can be obtained through interventions to enhance access to land by youth, facilitate affordable and youth friendly financial services for agri-entrepreneurship, engage youth in research, development and utilization of innovative agricultural technologies, and augment youth capacity in relevant food value chains, marketing and markets through information and skills training.

Target 2.4: **Ensure By 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality**

1. Decrease dependence on rain-fed agriculture through finalizing and including water harvesting plans in CIDPs and have clear and equitable regulations and guidance on natural resource management both at county and national level.
2. Make better use of diverse, nutritious, and more drought-adapted crops in response to increasing climatic variability. This will require a solid knowledge base on suitable (potentially traditional and currently under-valued) crops plus sharing this knowledge and promoting skills of farmers to cultivate such crops and stimulating demand for these crops through raising awareness within communities of their value and promoting institutional food procurement.
3. Ensure that post-harvest losses are minimized through enhanced skills of farmers in supply chain management, providing better storage facilities for crops and food, improving the food supply chain from farmers to markets to the consumer through food initiating conservation and processing (drying, packaging, transforming) and better marketing of food.
4. Strengthen and ensure better links between food production, processing, safety and quality management, storage, transport, trading and final retail whilst promoting the sustainable use of natural resources and

safeguarding of biodiversity. This can be done through improved uptake of adequate skills and tools for production, pro-smallholder producer systems for aggregation, quality assurance and marketing, increased value addition and improved commodity markets.

5. Prioritize implementation of a national climate adaptation plan, community-based resilience building, and emergency preparedness, together with livelihood diversification initiatives, to better withstand repeated natural disasters and impacts of climate change.

6. Improve disaster risk reduction strategies and preparedness for emergency by promoting national and county linkages in coordination, ensuring that the relevant institutions can fast-track disbursement of funds to mitigate early impacts from drought or flooding and that disaster response, rehabilitation and reconstruction is informed by evidence. Implement both national and, especially, county capacity to promote capacities and competencies where required to achieve this.

7. Strengthen farmers' cooperatives and organizations through training in organizational, functional and financial areas; sustainable land management practices; how to increase income through markets and access to financial services; and how to increase lobbying and advocacy capacity of members, leaders and staff; and creating awareness on gender, HIV/AIDS and climate change among the members.

Target 2.5 Maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed by 2020

1. Invest in documenting traditional knowledge and the nutritional, medicinal or economic value of Kenyan plants and animals by providing incentives for research from the private or educational sector.

2. Expand colleges offering courses in genetics and build capacity of technical personnel with respect to collection and documentation of genetic materials for seeds, cultivated plants, farmed and domesticated animals and their related wild species.

3. Promote opportunities for farmers to engage in using and protecting diverse genetic resources in crop and livestock farming, among others by characterizing, producing and distributing certified seeds of farmer varieties.

4. Organize common interest groups, for example farmer groups, to harvest medicinal plants to better manage genetic material.

5. Address Kenya's GMO policy and consider relaxing the current zero tolerance. Undertake case studies and derive lessons from counties where transformative agricultural policies have led to increased food production.

Target 2 (a) Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

1. Strengthen public investment allocations for socially profitable interventions, particularly agricultural infrastructure development and agricultural research and extension, while transitioning from output and input price subsidies.

2. Strengthen existing indemnity-based insurance programmes by focusing on improved affordability, accessibility and trust of such programmes, and promote index-based agricultural insurance programmes.

3. Strengthen the access of smallholder producers to markets as well as to credit and insurance by strengthening legislation on cooperatives, savings and credit societies, and scaled-up index insurance schemes.

4. Create a financial institution (farmers'/ agriculture bank) that will offer affordable credit and financial services on a cost-effective basis, and develop appropriate credit packages that are suitable for small-scale producers to enable them to access key inputs and risk insurance.

Target 2 (b) Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round

1. Ensure that national food safety and quality standards are aligned to international standards through rigorous controls as part of institutional food procurement (national strategic reserve, school meals) at aggregation points, disease free zones and holding grounds and in markets. In addition, the Government should strengthen the capacity of farmers, and especially the youth and other actors in relevant food value chains to comply with such standards through information and skills training.
2. Stimulate (county and national) increased domestic trade in food products by revising some of the existing taxes and levies that presently hinder inter-county trade.
3. Promote harmonization of customs and tax regimes in the East African Community region; review the trade licensing regime to ease the cost and process of doing business; and set-up more Special Economic Zones (SEZs) or economic blocs among counties with significant agricultural production with the aim of value addition to the commodities produced in order to increase international trade.

Target 2 (c) Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

1. Revamp national farmers' and pastoralist market information system and service infrastructure in close collaboration with county governments.
2. Strengthen farmer cooperatives to empower their price setting capability; and provide disaggregated data on food reserves.
3. Establish an open, efficient and adequately regulated commodity futures market for agricultural products to reduce risks faced by producers in the agriculture sector by trading in contracts

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References

Part 4

References

Achieng, C., Okoth, P., Macharia, A., & Otor, S. (2009). Policy framework for utilization and conservation of below-ground biodiversity in Kenya. *Tropical and Subtropical Agroecosystems*, Vol. 11, Núm. 2, 2009, 397-401.

African Union Second Ordinary Assembly (July 2003). Maputo declaration on agriculture and food security in Africa.

African Women Studies Centre & Kenya National Bureau of Statistics (2014). National food security baseline survey.

Ariga, J., Jayne, T. S., & Njukia, S. (2010). Staple food prices in Kenya. Variation in staple food prices: Causes, consequence, and policy options. COMESA policy seminar, Maputo, Mozambique, 25-26 January 2010.

Brooks, S., Thompson, J., & & H. Odame, H. (2009). Environmental change and maize innovation in Kenya: Exploring pathways in and out of maize. STEPS Working Paper 1–75. Retrieved *(http://www.ids.ac.uk/files/dmfile/STEPSWorkingPaper36.pdf).*

Central Bureau of Statistics, Ministry of Health, Kenya Medical Research Institute, Kenya National Council for Population and Development, ORC Macro & Centers for Disease Control and Prevention (July 2004). Kenya demographic and health survey 2003 Nairobi, Kenya.

Chandrika, B. K. et al. (February 2017). National strategic review of food security and nutrition: Towards zero hunger in Sri Lanka.

Chantarat, S., Mude, A. G., Barrett, C. B., & Carter, M. R. (January 2011). Designing index based livestock insurance for managing asset risk in Northern Kenya. *Journal of Risk Insurance* 80 (1), 205-237.

Davies, W., & Gustafsson, J. (May 2015). Water resources in Kenya : Closing the gap.

De Boef., & Walter, S. (2017). Enhancing resilience to climate change of smallholder farmers through increased use of crop genetic diversity. Consultancy report for KfW Development Bank and Global Crop Diversity Trust. Arnhem, the Netherlands. Working Paper: *https://www.researchgate.net/publication/319058794.*

Dietz, T., Foeken, D., Soeters, S., & Klaver, W. (January 2104). Agricultural dynamics and food security trends in Kenya. Research Report 2013-ASC-4.

Economic and Social Research Council (2015). Environmental change and maize innovation in Kenya: Exploring pathways in and out of maize. *http://steps-centre.org/wp-content/uploads/steps-4-maize-cecurity-does-not-equal-food-security.pdf.*

Ellen, R. E. (August 2017). Why is Kenya poor? Looking at poverty in Kenya. *https://borgenproject.org/why-is-kenya-poor/.*

Elliott, H., & Fowler, B. (September 2012). Markets and poverty in northern Kenya: Towards a financial graduation model. Financial sector deepening – Kenya.

Ellis, J. (December 2014). Climate resilience indicator literature review. Prepared as part of using Columbia Basin State of the basin indicators to measure climate adaptation 69. *http://www.cbrdi.ca/wp-content/uploads/ClimateAdaptation_LitReview_15-03-15.pdf.*

Farm Africa (2016). Market study of the aquaculture market in Kenya.

Food and Agriculture Organization (2000). Special report on crop and food supply situation in Kenya

Food and Agriculture Organization (2012). The state of food insecurity in the world.

Food and Agriculture Organization (November 2014). ICN2 second international conference on nutrition: Better nutrition, better lives. *http://www.fao.org/3/a-as601e.pdf.*

Food and Agriculture Organization (November 2014). Nutrition-sensitive agriculture. In second international conference on nutrition.

Food and Agriculture Organization, Technical Centre for Agricultural and Rural Cooperation & International Fund for Agricultural Development (2014). Youth and agriculture: Key challenges and concrete solutions. *(http://www.fao.org/3/a-i3947e.pdf?utm_source=linkedin&utm_medium=social+media&utm_campaign=faolinkedin).*

Food and Agriculture Organization (2015). Fishery and aquaculture country profiles. The Republic of Kenya

Food and Agriculture Organization/High Level Panel of Experts (2017). Nutrition and food systems. Committee on world food security high level panel of experts on food security. Rome: Committee on World Food Security.

Food and Agriculture Organization (September 2017). Crop prospects and food situation. Quarterly Global Report.

Food and Agriculture Organization (September 2017). The state of food security and nutrition in the world. Building resilience for peace and food security.

Gichuhi, W., & Odwe, G. (2009). Population and food security in Kenya: An application of spectrum model.

Grantham-McGregor, S. et al. (2007). Developmental potential in the first 5 years for children in developing countries. *Lancet*, *369* (9555): 60-70.

International Centre of Insect Physiology and Ecology (2013). Addressing food losses: Status and way forward for post-harvest research and innovations in Kenya. Policy Brief 5/13

International Food Policy Research Institute (2016). Global nutrition report 2016: From promise to impact: ending malnutrition by 2030. Washington, D.C. *http://dx.doi.org/10.2499/9780896295841.*

Jägerskog, A., & Jønch, C. (2012). Feeding a thirsty world: Challenges and opportunities for a water and food secure future. Stockholm International Water Institute.

Kakwania, N., Hyun, H., & Sonb, H. H. (2016). Measuring food insecurity: Global estimates.

Kaluli, J. W., Home, P. G., & Githuku, C. (2014). The heavy metal content of crops irrigated with untreated wastewater: A case study of Nairobi, Kenya. *Journal of Agriculture Science and Technology* 16(2): 122–39.

Kang'ethe, E. K. (September 2011). Situation analysis: Improving food safety in the maize value chain in Kenya. Report prepared for FAO by Prof. Erastus Kang'ethe, College of Agriculture and Veterinary Science University of Nairobi: 1–89.

Kang'ethe, E. K., & Lang'a, K. A. (2009). Aflatoxin B1 and M1 contamination of animal feeds and milk from urban centers in Kenya. African Health Sciences 9(4): 218–26.

Kenya Agricultural Research Institute (2012). Policy responses to food crisis in Kenya.

Kenya Dairy Board (2016). Report of a study on assessing the cost of production structures in dairy systems in Kenya. Tegemeo Institute and Kenya Dairy Board.

Kenya National Bureau of Statistics (2017). Various economic surveys; 2017 estimated data; 2018 and 2019 forecast data.

Kenya National Bureau of Statistics, Ministry of Health, National AIDS Control Council, Kenya Medical Research Institute, National Council for Population and Development & The DHS Program, ICF International (August 2015). Kenya Demographic and Health Survey 2014. Nairobi – Kenya.

Kenya National Bureau of Statistics, National AIDS Control Council, National AIDS/STD Control Programme, Ministry of Public Health and Sanitation, Kenya Medical Research Institute, National Coordinating Agency for Population and Development, MEASURE DHS, ICF Macro, United States Agency for International Development, United Nations Population Fund, United Nations Children's Fund (June 2010). Kenya Demographic Health Survey, 2008-09. Nairobi Kenya.

Kenya Vision 2030 (2008). Popular version. *www.vision2030.go.ke.*

Kerer, J. (June 2013). Background paper on the situation of agricultural insurance in Kenya with reference to international best practices.

Kirimi, L., Njue, E., & Mathenge, M. (June 2015). "Determinants of crop insurance uptake decisions in the face of climate change : Evidence from smallholders in Kenya. A paper prepared for presentation at the 16th Global Development Network Conference, Casablanca-Morocco.

Lagat, P. (2015). The effects of climate variability on livestock revenues in Kenya. Kenya Institute for Public Policy Research and Analysis: KIPPRA Discussion Paper No. 182.

Larsson, M. (2012). Soil fertility status and striga hermonthica infestation relationship due to management practices in western Kenya." Faculty of Natural Resources and Agricultural Sciences, Dept. of Soil and Environment: 96. *http://stud.epsilon.slu.se/4488/.*

Lattice Consulting (June 2016). Report on market study of the aquaculture market in Kenya. Kenya market-led aquaculture programme.

Lem, A., Bjorndal, T., & Lappo, A. (2014). Economic analysis of supply and demand for food up to 2030: Special focus on fish and fishery products. FAO Fisheries and Aquaculture Circular No. 1089. Rome, FAO. 106.

Mangale, N., Muriuki, A., Kathuku-Gitonga, A., & Mutegi, J. (2016). Soil fertility management book of abstracts for Kenya. Kenya Soil Health Consortium.

Mburu, S., Otterbach, S., Alfonso, S., & Mude, A. (September 2016). Income and asset poverty among pastoralists in Northern Kenya.

Mendes, D. M., & Paglietti, L. (2015). Kenya: Irrigation market brief.

Ministry of Devolution and Planning (2013). Millennium development goals. Status report for Kenya.

Ministry of Devolution and Planning (2016). Millennium development goals. Status report for Kenya.

Ministry of Devolution and Planning (June 2017). Implementation of the agenda 2030 for sustainable development in Kenya.

Mohajan, H. K. (2014). Food and nutrition scenario of Kenya. *American Journal of Food and Nutrition* 2.2: 28-38.

Mukherjee, S. (2012). "Aflatoxin effect on health. *http://www.fao.org/fileadmin/user_upload/wa_workshop/ECAfrica-caadp/4._Aflatoxin_USAID.pdf.*

Murphy, S. (October 2009). Strategic grain reserves in an era of volatility. Institute for Agriculture and Trade Policy.

Muyanga, M., & Jayne, T. S. (2014). Effects of rising rural population density on smallholder agriculture in Kenya. *Food Policy* 48: 98–113.

National Farmers Information Service (2016). Honeybee colony management. *http://www.nafis.go.ke/livestock/bee-keeping.*

Ngigi, S. N. (2002). Review of irrigation development in Kenya. The changing face of irrigation in Kenya: Opportunities for anticipating change in Eastern and Southern Africa. 2025:35–54.

Njagi, T., Kirimi, L., Onyango, K., & Kinyumu, N. (2014). An analysis of agricultural sector funding by county governments. (12): 1–7.

Njue E., Mathenge, M., & Ngig, M. (September 2013). Sweet potato marketing among smallholder farmers: The role of collective action. A paper presented at the 4th AAAE conference in Tunisia.

Ochieng, J., Kirimi, L., & Mathenge, M. (2016). Effects of climate variability and change on agricultural production: The case of small-scale farmers in Kenya. NJAS - Wageningen Journal of Life Sciences 77: 71–78. *http://dx.doi.org/10.1016/j.njas.2016.03.005.*

Oduori, L. H., & Njeru, T. (2016). A review paper on large-scale irrigation in Kenya : A case study of maize.

Olwande, J., & Mathenge, M. (August 2012). Market participation among poor rural households in Kenya. *The International Association of Agricultural Economists (IAAE) Triennial Conference*, Foz do Iguacu, 18-24. 1–29 in *International Association of Agricultural Economists (IAAE) Triennial Conference,* Brazil.

Onyango, I. G., Jameel, D., & Shaharyah, M. K. (March 2016). Mitochondrial dysfunction in alzheimer's disease and the rationale for bioenergetics based therapies. *Aging and Disease* 7(2): 201–214. doi: 10.14336/AD.2015.1007.

Onyango, K., Njagi, T., Kinyumu, N., & Kirimi, L. (2016). Changing consumption patterns among rural and urban households in Kenya. (2): 3–6.

Osmani, S. R., Akhter, A., Tahmeed, A., Hossain, N., Huq, S., & Shahan, A. (September 2016). Strategic review of food security and nutrition in Bangladesh.

Otieno, D. C., Kirimi, L., & Odhiambo, N. (2015). Can irrigation be an answer to Kenya's food security problem? (19): 1–5.

Rapsomanikis, G. (2015). The economic lives of smallholder farmers. An analysis based on household data from nine countries.

Republic of Kenya (2003). Economic recovery strategy for wealth and employment creation policy.

Republic of Kenya (2004). Ministry of Agriculture. Strategy for revitalizing agriculture.

Republic of Kenya (2004). Ministry of Planning and National Development. Investment programme for the economic recovery for wealth and employment creation 2003-2007.

Republic of Kenya (2005). National agricultural sector extension policy.

Republic of Kenya (2007). Ministry of Lands. National land policy.

Republic of Kenya (2008). Kenya cooperative development policy.

Republic of Kenya (2008). Ministry of Planning, National Development and Vision 2030. Kenya Vision 2030: First Medium Term Plan 2008-2012.

Republic of Kenya (2008). National livestock policy.

Republic of Kenya (August 2009). Ministry of Agriculture. Food security in Kenya.

Republic of Kenya (2009). National climate change response strategy – 2009 and 2010.

Republic of Kenya (2009a). State for the development of Northern Kenya and other arid lands. Vision 2030.

Republic of Kenya (2010). Constitution of Kenya.

Republic of Kenya (2010). Kenya land policy 2010.

Republic of Kenya (2010). Ministry of Agriculture. Agriculture sector development strategy 2010-2020.

Republic of Kenya (2011). Ministry of Health. The Kenya national micronutrient survey.

Republic of Kenya (2011). National social protection policy.

Republic of Kenya (2012). Ministry of Agriculture and Livestock Development report.

Republic of Kenya (2012). National climate change action plan 2013 – 2017. Executive summary.

Republic of Kenya (2012). National horticulture policy.

Republic of Kenya (2013). Medium term investment plan: 2013 - 2017.

Republic of Kenya (2013). Ministry of Devolution and Planning. Vision 2030: Second medium term plan 2013-2017.

Republic of Kenya (2013). Ministry of Environment, Water and Natural Resources. The national water master plan 2030.

Republic of Kenya (2014). Forest policy.

Republic of Kenya (2014). Ministry of Health. Kenya health policy 2014-2030.

Republic of Kenya (2014). Ministry of Health. Maternal, infant and young children nutrition knowledge attitude, and practices baseline survey - Turkana County.

Republic of Kenya (2015). Ending drought emergencies policy.

Republic of Kenya (2015). Ministry of Agriculture, Livestock and Fisheries. Economic review of agriculture.

Republic of Kenya (2015). Ministry of Health. Kenya STEP-wise survey for non-communicable diseases risk. Factors Report.

Republic of Kenya (2016). Fisheries management and development policy.

Republic of Kenya (2016). Ministry of Agriculture national policy workshop on smallholder agriculture mechanization in Kenya

Republic of Kenya (2016). Ministry of Agriculture, Livestock and Fisheries. Economic review of agriculture.

Republic of Kenya (2016). Ministry of Agriculture, Livestock and Fisheries. National policy workshop on smallholder agriculture mechanization in Kenya.

Republic of Kenya (2016). Ministry of Environment and Natural Resources. Kenya national adaptation plan: 2015-2030.

Republic of Kenya (2016). Ministry of Health. Maternal, infant and young children nutrition knowledge attitude and practices baseline survey - Homa-Bay County.

Republic of Kenya (2017). Ministry of Agriculture, Livestock and Fisheries. Kenya climate smart agriculture strategy 2017-2026.

Republic of Kenya (2017). Ministry of Agriculture, Livestock and Fisheries. Kenya youth agribusiness strategy 2017-2021.

Republic of Kenya (2017). National disaster risk management policy.

Republic of Kenya (2017). National food and nutrition security policy and implementation framework.

Republic of Kenya (April 2017). Kenya youth agribusiness strategy 2017 -2021: Positioning the youth at the forefront of agricultural growth and transformation.

Sadza, H. C., Nherera, C. M., Nhenga-Chakarisa, T., Tagwireyi, J., & Munyuki-Hungwe, M. (June 2015). Zimbabwe zero hunger strategic review.

Sheahan, M., & Barret, C. (2017). Review: Food loss and waste in Sub-Saharan Africa. Food Policy (70), 1-12.

Staal, S. J., Alejandro, N. P., & Jabber, M. (2008). Dairy development for the resource poor part 2: Kenya and Ethiopia dairy development case studies pro-poor livestock policy initiative. *http://www.igad- lpi.org/publication/docs/IGADLPI_WP _MK.pd*.

Sustainable Agriculture and Food Systems of the Sustainable Development Solutions Network (September 2017). Solutions for sustainable agriculture and food systems. Technical Report for the Post-2015 Development Agenda.

Sustainable Development Goals Kenya Forum for Sustainable Development (2017). Submissions by civil society organizations to the Government of Kenya towards voluntary national review report.

The International Institute of Tropical Agriculture (January 2017). Synthesis report of the Nigeria zero hunger strategic review.

The Presidency (May 2017). Voluntary national review of progress on SDGs in Kenya. Nairobi, Kenya. *http://sdgkenyaforum.org/2017/07/15/voluntary-national-review-vnr-of-progress-on-sdgs-in-kenya/*.

United Nations Children's Fund (2008). *The Lancet's series on maternal and child under-nutrition. Executive summary. http://www.thelancet.com/series/maternal-and-child-nutrition.*

United Nations Development Assistance Framework (2017). UNDAF road map 2018 June 0 2022 June – Kenya.

United Nations Development Programme (2016). Youth enterprise development agents make a difference in counties. *http://www.ke.undp.org/content/kenya/en/home/ourwork/inecgr/successstories/cultivating-youth-entrepreneurship-through-agribusiness.html.*

United Nations General Assembly (1948). Universal declaration of human rights.

United Nations Global Compact (2015). Sustainable development goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

United Nations Sustainable Development Summit (September 2015). Transforming our world: The 2030 agenda for sustainable development - New York, USA.

United States Agency for International Development (May 2014). Feed the future progress report: Accelerating progress to end global hunger report. www.feedthefuture.gov.

United States Agency for International Development (2017). Kenya greenhouse gas emissions factsheet. https://www.climatelinks.org/resources/greenhouse-gas-emissions-factsheet-kenya.

Wayne, G. G., Dyer, R., & Wendy-Ann P. T. (2017). *Improving nutrition in ACP countries.* CTA Policy Brief.

Will, D., & Gustafsson, J. (May 2015). Water resources in Kenya: Closing the gap.

World Bank (2009). Gender in agriculture sourcebook.

World Bank (2011). Missing food: Case of postharvest grain losses in Sub-Saharan Africa. Report No. 60371AFR *https://siteresources.worldbank.org/INTARD/Resources/MissingFoods10_web.pdf.*

World Food Programme, Humanitarian Aid and Civil Protection & Government of Kenya (May 2013). Market dynamics and financial services in Kenya's arid lands.

World Food Programme (2016). Comprehensive food security and vulnerability analysis: Summary Report Kenya.

World Health Organization (2001). Turning the tide of malnutrition, responding to the challenge of the 21st century. *http://www.who.int/mip2001/files/2232/NHD brochure.pdf.*

World Health Organization (2010). Indicators for assessing infant and young child feeding practices.

Zhenghong, T., Brody, S. D., Quinn, C., Chang, L., & Wei, T. (January 2010). Moving from agenda to action: evaluating local climate change action plans. *Journal of Environmental Planning and Management* Volume 53, 2010 Issue 1. *http://dx.doi.org/10.1080/09640560903399772.*

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Appendices

Appendices

Appendix I: Concept Note

1. Background

Kenya's economy was reclassified as lower-middle income in 2014 after re-basing. However, poverty, food insecurity, under-nutrition and income inequality remain high; 46 percent of Kenyans live below the national poverty line. The most severe conditions exist in the Arid and Semi-Arid Lands (ASALs) and in particular north-eastern part of Kenya, which is underdeveloped, drought-prone and often disrupted by local conflicts. Kenya also has 500,000 registered refugees and asylum seekers who are mainly hosted in camps located in Garissa and Turkana counties.

Kenya Vision 2030 is the country's development blueprint for 2008 to 2030[104] and is being implemented in successive five-year Medium-Term Plans (MTPs), with the second plan MTP covering 2013 to 2017.[105] The contribution of UN agencies to MTP II are set out in the he United Nations Development Assistance Framework (UNDAF) 2014 to 2018. The third MTP being developed will cover 2018 to 2022. The government is committed to end the worst of the suffering caused by drought by 2022, with actions set out in the Drought Risk Management and Ending Drought Emergencies MTP for 2013 to 2017, which is part of the Kenya Vision 2030 MTP II. The 2010 Constitution devolved many governance functions to counties aimed to address developmental issues and Kenya has a "Roadmap to Sustainable Development Goals (SDGs) - Kenya's Transition Strategy" under the (then) Ministry of Devolution and Planning.[106] The roadmap elements include advocacy and sensitization on SDGs; domestication/localization of SDGs; resource mobilization for the post - 2015 agenda; institutional framework; tracking and reporting; SDG indicators; SDG data for monitoring and reporting; and capacity building.

The Government recognizes that partners should be involved in SDG process, as they will contribute in translation of goals into action. The recognized stakeholders are national and county governments, national and county assemblies, development partners (including UN agencies), research and academic institutions, and non-state actors (non-governmental organizations, faith based organizations, foundations, private sector and philanthropists). The SDGs will be integrated within national and county planning frameworks, localized and domesticated by mainstreaming them into the third MTP, sector plans and the County Integrated Development Plans (CIDPs) of the 47 counties.

The Kenya National Bureau of Statistics (KNBS) recently convened stakeholders to identify provisional indicators from 230 SDG indicators. These have been identified based on relevance, national priority and data availability. The Ministry of Devolution and Planning is finalizing 22 documents for cabinet approval that detail the lead roles of ministries in SDGs. It is expected that the Ministry of Agriculture and Irrigation will lead SDG 2.

2. Objectives

The objectives of towards zero hunger strategic review will be to:

(i) Provide a comprehensive understanding of the food security, nutrition situation and sustainable agricultural in Kenya including strategies, policies, programs, coordination mechanisms, and institutional capacities.

(ii) Highlight the linkages between food security, improved nutrition and promotion of

104 Vison 2030 popular version www.vision2030.go.ke

105 Second Medium Term Plan (2013 to 2017) www.vision2030.go.ke

106 Now the Ministry of Devolution and ASAL.

sustainable agriculture currently addressed through different sectors and entities, and propose potential synergies.

(iii) Identify gaps and challenges in the national response and consequently inform and augment the government-led process of domesticating SDGs through mainstreaming them within MTP III.

(iv) Provide an overview of potential measures in priority areas to accelerate progress towards the goals set in SDG 2, inclusive of recommendations on how potential measures may be implemented (incorporating the relevant stakeholders).

(v) Propose actionable areas where partners can better support Kenya to make significant progress toward zero hunger.

(vi) Recommend milestones for a national zero hunger roadmap.

PROCESS STEPS	KEY QUESTIONS	INPUT
1. ANALYSIS OF THE FOOD SECURITY AND NUTRITION SITUATION	➢ What are the main trends and problems? ➢ What are the causes? ➢ What are the humanitarian challenges?	• Literature and secondary data review • Vulnerability & food security assessments • Gender analysis • Consultations
2. NATIONAL POLICY AND PROGRAMMATIC RESPONSE	➢ What are the main national targets and goals? ➢ What programmes and policies are implemented to achieve these targets and goals? With what financial and institutional resources?	• Review of national policy and programme frameworks and budgets • National evaluations • Sector funding reviews • Consultations
3. GAPS IN THE FOOD SECURITY AND NUTRITION RESPONSE	➢ Which gaps in humanitarian and development assistance planning, design, implementation, capacity and/or resourcing, hinder the achievement of targets and goals?	• Benchmarking of the situation against the targets and the response • Review of findings from previous steps • Consultations
4. RECOMMENDATIONS	➢ What needs to be done to fill the gaps? ➢ What institutional, financial and human resources are required? ➢ How will priority humanitarian and development actions be implemented?	• Review of all findings • Consultations including validation of outcomes

3. Methodology

Process: The analysis of the national food security, improved nutrition and promotion of sustainable agriculture situation and respective opportunities to accelerate progress toward reducing food insecurity, eliminating malnutrition and promoting sustainable agriculture should cover at least four aspects: analysis of the food security, nutrition and agricultural sustainability situation; national policy and programmatic response; gaps in the food security, nutrition response, agricultural sustainability; and recommendations.

Output: The output from this process will be a report on "Zero Hunger Strategic Review".

4. Organizational Structure

Towards zero hunger strategic review will be undertaken under the overall leadership of the Government of Kenya represented by the Ministry of Agriculture and Irrigation and specifically the Principal Secretary - State Department of Crops. The implementation of the Zero Hunger Strategic Review will be structured a follows:

Lead Convener: A senior convener with substantial expertise and experience in leading national planning processes will lead the strategic review process. The person will promote national ownership of the process, while convening and promoting the inclusive participation of senior government officials, international organizations, civil society, academia, key donors and other stakeholders. It

is important to note that the lead convener will be responsible to connect the work of the strategic review team to the Advisory Board and support linkages between the strategic review and other national processes and priorities.

Advisory Board: An Advisory Board will be formed and will be chaired by the Principal Secretary – State Department of Crops. The Board will be composed of representatives of key national and international institutions related to food security, nutrition and agriculture including experts/senior technical staff. The Advisory Board will be responsible for guiding thematic and technical discussions, reviewing progress on the drafts in the production of the review, and will advise on strategic alignment of issues and validation of research findings.

Research/Technical Team: The technical team will be formed and led by the Lead Convener. Core technical team members will be drawn from independent research institutions and consultants based mainly in Kenya and potentially internationally with expertise and experience in food, nutrition and agricultural research. The research team will also include technical members and focal points nominated by the Government and WFP. The technical team will manage day-to-day activities including mapping out relevant activities, consultations with stakeholders and gathering of information, and the drafting and finalization of the report within the planned timeframes.

5. Process Management

Towards zero hunger strategic review will be carried out through a consultative and inclusive process involving all stakeholders. The lead convener along with the research team will carry out a desk review of relevant literature, collect additional data if necessary and draft the towards zero hunger strategic review report, which will be shared with the Advisory Board for review before high level meetings are organized by the lead convener. At least three meetings will be held to present the draft report to the Advisory Board for comments.

Appendix II: Sustainable Development Goal 2 Targets and Indicators

Targets	Indicators
2.1 By 2030 end hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round	2.1.1 Prevalence of undernourishment 2.1.2 Prevalence of moderate or severe food insecurity in population, based on food insecurity experience scale
2.2 By 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons	2.2.1 Prevalence of stunting (height for age < -2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards (CGSs) among children under 5 years of age 2.2.2 Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO CGSs) among children under 5 years of age, by type (wasting and overweight)
2.3 By 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size 2.3.2 Average income of small-scale food producers, by sex and indigenous status
2.4 By 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality	2.4.1 Proportion of agricultural area under productive and sustainable agriculture
2.5 By 2020 maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed	2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities 2.5.2 Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction
2. (a) Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, in particular in least developed countries	2. (a) 1 The agriculture orientation index for government expenditures 2. (a) 2 Total official flows (official development assistance plus other official flows) to the agriculture sector
2. (b) Correct and prevent trade restrictions and distortions in world agricultural markets including by the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round	2. (b) 1 Agricultural export subsidies
2. (c) Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	2. (c) 1 Indicator of food price anomalies

REPUBLIC OF KENYA

Towards Zero Hunger Strategic Review

Kenya | May 2018

This review provides an analysis and evaluation of the current status and trends of agriculture, food and nutrition security in Kenya within the context of the United Nations **SDG 2 "End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture"**.