



**Master in Human Development and Food Security**

# **The case of Kenya: How can value chains be shaped to improve nutrition?**

*Research undertaken at the request of the Global Forum on Food Security and Nutrition (FSN)*

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# **THE CASE OF KENYA: HOW CAN VALUE CHAINS BE SHAPED TO IMPROVE NUTRITION?**

## **Assignment**

This research has been undertaken at the request of the Global Forum on Food Security and Nutrition (FSN) by the class of 2016/2017 of the Master in Human Development and Food Security at Roma Tre University. The students were asked to conduct an in-depth analysis concerning the introduction of a nutrition-sensitive value chain (NSVC) framework to understand how value chains can be shaped to improve nutrition using Kenya as a case study.

## **Introduction**

Kenya is a country marked by significant food insecurity, high rates of malnutrition and nutritional vulnerability, as well as great variation in poverty levels. Food insecurity and nutritional vulnerability in Kenya have been attributed to several factors including frequent droughts, previous displacement of farmers, high costs of domestic food production, high global food prices, and significant poverty and low purchasing power. (USAID, 2016). Malnutrition in the country contributes to one-third of all deaths of children under 5 while inadequate infant and young child feeding practices contribute to high-country-wide undernutrition. In addition, micronutrient deficiencies are far-reaching and are complicated by inadequate consumption of foods rich in vitamin A and iron. Nutritional vulnerability is also complicated by geographical areas with the highest burden of undernutrition in the country in the North Eastern Province, which is characterized by frequent droughts and high levels of poverty and food insecurity (USAID, 2014).

While the country's economic growth rose by 5.7 percent in 2013 fuelled by strong consumption and investment, the agriculture sector remains as the foundation of Kenya's economy and the source of livelihood for the majority of the rural population (USAID, 2014). According to the Kenya Bureau of Standards (2017), the agriculture sector contributes approximately 26 percent of the country's GDP and employs 75 percent of the population. Despite the importance of agriculture for Kenya's economy, the sector is faced with significant challenges, resulting in negative effects on food value chains (FVCs). According to USAID (2014), agriculture productivity in Kenya suffers from frequent droughts, floods, climate change, as well as high proportions of arid and semiarid land.

As a result of the complexity of the agricultural industry in Kenya further compounded by significant rates of food insecurity, malnutrition, and poverty, there is much needed improvement in terms of FVCs in order to improve nutritional vulnerability. We have therefore conducted an in-depth analysis on Kenya to provide an understanding of how FVCs can be shaped and utilized to improve nutrition.

## Question 1: What challenges and opportunities arise when developing VC to be more nutrition-sensitive?

To gain a full understanding of a NSVC it is important to consider the whole process of the food chain from the production to the consumption of food including the challenges and opportunities that may arise when developing value chains (VCs) to be more nutrition-sensitive. This process is complex and involves multiple sectors including agriculture, education, public health, and vulnerable groups, as well as collaboration, coordination and participation at a multi sectoral level.

### Poverty

Poverty in Kenya varies significantly and therefore presents a significant challenge when developing VCs to be more nutrition-sensitive, as VCs must be adapted or varied to specific contexts. For example, according to Figure 1 below, the capital city, Nairobi, has the same multidimensional poverty index (MPI) as the Dominican Republic, which ranks in the middle of the countries analyzed, whereas rural areas of northeastern Kenya have a lower MPI than Niger, the poorest of all countries analyzed (Oxford Poverty and Human Development Initiative, 2016). The composition of poverty also differs among regions and ethnic groups. For example, different ethnic groups in Kenya with similar rates of poverty experience different deprivations. Deprivation in the health indicators of child mortality and malnutrition are the highest contributors to the poverty of the Kikuyu (39 per cent of whom are MPI poor), whereas deprivations in living standards, such as access to electricity, adequate sanitation and cooking fuel, contribute most to the poverty of the Embu (37 per cent of whom are MPI poor).

**Figure 1:** Kenya: Multidimensional Poverty across Sub-national Regions (Oxford Poverty and Human Development Initiative, 2016)

#### Kenya

OPHI Country Briefing December 2016

##### J. Multidimensional Poverty across Sub-national Regions

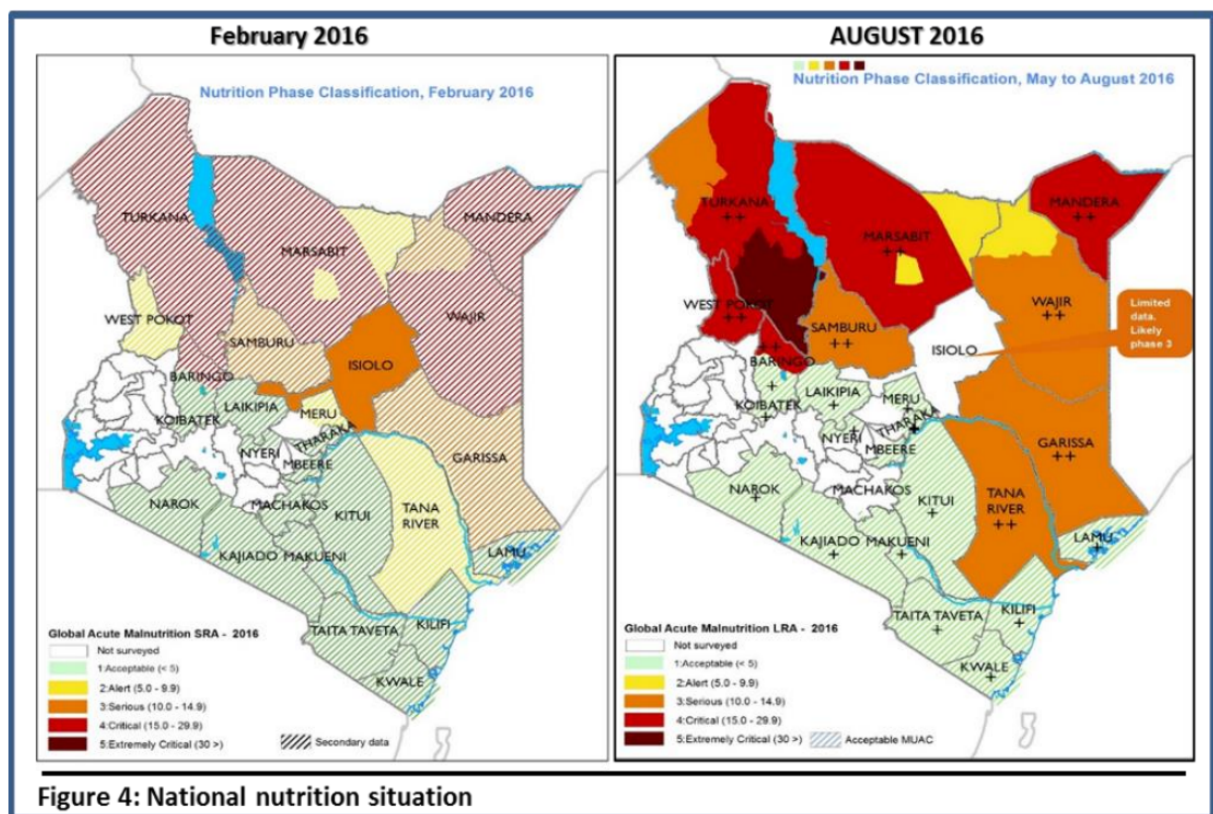
Region	MPI (H x A)	H (Incidence) k ≥ 33.3%	A (Intensity)	Percentage of Population:			Inequality Among the MPI Poor	Population Share
				Vulnerable to Poverty k = 20%-33.3%	In Severe Poverty k ≥ 50%	Destitute		
Kenya	0.187	39.9%	47.0%	28.3%	14.5%	12.9%	0.151	100%
Urban	0.076	17.3%	43.6%	21.3%	4.8%	-	-	33.8%
Rural	0.245	51.4%	47.5%	31.9%	19.5%	-	-	66.2%
Nairobi	0.020	4.8%	41.9%	12.6%	1.0%	0.0%	0.032	8.8%
Central	0.075	18.2%	40.9%	30.1%	2.8%	2.0%	0.056	10.8%
Eastern	0.190	41.9%	45.3%	31.0%	13.1%	10.1%	0.131	14.7%
Rift Valley	0.205	42.4%	48.3%	30.4%	17.4%	15.2%	0.174	26.7%
Nyanza	0.211	47.7%	44.2%	30.8%	13.2%	14.7%	0.084	14.3%
Western	0.223	50.0%	44.5%	36.6%	13.5%	17.1%	0.089	12.0%
Coast	0.242	49.5%	48.8%	22.1%	22.6%	16.2%	0.162	9.8%
North Eastern	0.509	83.3%	61.1%	10.8%	64.3%	48.8%	0.257	2.8%

## Geography and Nutrition Vulnerability

Nutrition vulnerability varies widely based on geography in Kenya and is an important component of analysis in FVCs and NSVCs. As seen from Figure 1 above and Figure 2 below, higher levels of poverty correlate with high levels of malnutrition.

In Northern Kenya, higher levels of poverty and malnutrition exist, primarily due to its geographical position, characterized by semi-arid and arid areas which receive below average annual rainfalls. The situation is worsening due to climate change and the prevalent drought. The Coastal region was once far more developed as a trade route from the Middle East to the inland of Kenya, however, the situation has changed post-independence and is now faced with the highest rates of severe poverty. Furthermore, investment has been concentrated on the main urban centres of Nairobi and Mombasa, while no intermediate urban centres have been designated for major investments. Thus, significant differences exist between urban and rural poverty as well as in the areas affected by malnutrition, which calls for a greater need for investment in rural areas.

**Figure 2:** National Nutrition Situation adapted from 2016 Long Rains Season Assessment Report (Government of Kenya, 2016)



## Refugees

Kenya has almost 500,000 refugees living within the country, and is hosting the largest refugee camp in the world called Dadaab. As commonly occurs in protracted crises, high rates of malnutrition are present within the camp, resulting in anaemia, iron and vitamin A deficiency (UNHCR, 2006). As mentioned by

UNHCR, there is a need for improvement in ratio adequacy of micronutrients, quantity, quality and diversification of food provision, ration management including problems related to food distribution and, among others, improved water and sanitation quality. While children and pregnant women should remain the focus of program targeting malnutrition, adolescents in the camps are mainly overlooked and should receive more attention. Research in Kakuma camp shows that anaemia (46%), iron deficiency (43%) and vitamin A deficiency (15%) under adolescents are high (Woodruff et al., 2005). When considering the future, it should be mentioned that these adolescents, due to the circumstances they are in, are likely to both marry and have children young. Ensuring that these adolescents are in good health before reproducing will have future benefits and prevents problems during pregnancy.

In Kenya, many refugees are relying on food assistance from WFP, which involves a monotonous diet of cereals, pulses and oil. The intake of vegetables, fruits and meat are inaccessible to most refugees living in the camp. WFP has started a pilot project in Kakuma and Dadaab camp, situated in a semi-arid region with limited rainfall, with the creation of multi-storey gardens (MSG). This project has not only increased the access to vegetables for refugees involved in the project, but also has provided refugees with the tools to enhance their own food security and has encouraged the empowerment of women who were mostly working on this project. This project could be a model to be strengthened and expanded.

### Rural children

Children living in rural areas in Kenya are particularly vulnerable to stunting, wasting and underweight. Higher levels of undernutrition have been found in dry seasons compared to wet seasons, meaning nutritional intake is highly dependent on rainfall. The diet is also more diversified in the rainy seasons than in the dry season. This could imply a need for better means for storing and drying food to ensure a diversified and more nutritional diet throughout the year. In addition, a study done by Kaibi et al. (2017) has not found a link between household food security and child nutritional status. According to Kaibi et al. (2017) the importance of non-food factors such as clean water, good sanitation and hygiene are important factors that can be a serious constraint to good nutrition. The study did however find a strong relationship between agricultural diversity and dietary diversity, in which 50% of the changes in dietary intake of children were due to agricultural biodiversity. Agricultural biodiversity in Kenya is therefore of the utmost importance and should not be undermined for the benefits of mono-cropping.

### Biodiversity and wildlife habitats

Kenya has large biodiversity and wildlife that has been under serious threat due to deforestation, climate change, pollution, soil degradation, overgrazing by domestic livestock and agricultural expansion. Taita Hills, situated in the northern part of Eastern Arc Mountains in both Kenya and Tanzania, is one of the most important regions for biological conservation, which has been affected by degradation due to agricultural expansion. Now only 1% of the original forested area remains preserved (Maeda, 2010). In addition, in 1973, the Marsabit forest spanned 18,363 hectares in 1973, while presently, only 11,000 hectares remain. The government of Kenya takes the responsibility of protecting the areas involving large biodiversity and wildlife through policies and legislation to prevent the loss of biodiversity. However, a balance needs to be found between the need for agricultural expansion and the importance of biodiversity.

### Climate change

Climate change has led to an increase in droughts in addition to the risk of flooding and soil erosion. An opportunity to counter the consequences of climate change is using the knowledge of long-established farmers who have been able to, based on their experience, to perceive long-term changes in temperature, precipitation and rainfall variability. These farmers have the agency to protect their livelihood to a certain

extent from climate change, through adjusting their farming practices including planting decisions, which is the current practice. However, investments that reach beyond the farmers capacity should be made in drought management, drought preparedness, flood risks, soil erosion, agroforestry and irrigation. At the moment, emergency relief is being provided, however, there is a need to move beyond short term coping mechanisms and move towards enhancing the coping mechanism towards climate change in a more sustainable way with the support of the government and the international community (Bryan et al., 2012)

The increasing number of droughts caused by climate change has resulted in an increased threat of cattle raiding. Cattle raiding has always been a traditional practice in Kenya and surrounding countries as a form of redistributive raiding. Due to the availability of weapons and increased food insecurity, cattle raiding has become increasingly violent and more common. The fear of being raided restricts herder mobility as it prevents herders from using the best grazing land due to the increased risk of cattle raiding. Cattle raiding also threatens the livelihood of herders in terms of their food security as they typically sell the meat for economic means and consume the milk of the cattle. Thus, in contrast, raiding has also become a coping strategy to increase one's food security. Up until this point, cattle raiding has been dealt with as a one-off shock while it has created a permanent state of insecurity that has long-term implications (Hendrickson et al, 1996).

### Land grabbing

Land grabbing in Kenya has serious consequences for food security and rural agricultural development. The Kenyan government sells land to countries like Qatar who are increasingly dependent on the international market for their food consumption. Due to increasing food prices in Qatar, a solution has been found in buying and cultivating land for agricultural purposes abroad, in Kenya, which is then used for food consumption in Qatar. The Kenyan government has agreed with these practices as agricultural investments were assumed to enhance agricultural technology in Kenya and boost food production in order to minimize future food shortages.

However, access to food has been a greater challenge than food production, and therefore the small farmers who are targeted by land grabbing are not only losing their livelihood but are also becoming increasingly food insecure. Furthermore, the private companies involved in land grabbing use mono-agriculture and are export-oriented. Therefore, there is a loss of variety in food production, and food is being exported while Kenya continues to see food insecurity issues amongst its population. The land grabbing continues to happen on the most fertile lands, leaving Kenyan farmers more vulnerable and subjected to areas increasingly affected by climate change. In addition, the private companies use chemical input and genetically-modified seeds, therefore affecting the biodiversity of Kenya, while discouraging traditional farming methods (Daniel, 2011).

### Governance

The government of Kenya has embarked on a strategy of devolution of power to lower levels, from the central government to counties and regional administrations. By the end of the financial year 2016/2017, the Government will have transferred in excess of 1 trillion Kenyan Shillings to County Governments since the implementation of the decentralization process (Kenya Economic Outlook, 2016).

It is the role and responsibility of the devolved government units to implement strong collaboration, coordination and linkages between the small scale farmers and their markets through improved service delivery and improved transport system. This has resulted in improved efficiencies in food deliveries, better roads, and infrastructure. This is a beneficial opportunity for the various political regions of the country to focus on their own needs related to infrastructural developments. Since Kenya is a very diverse



country, this strategy will better enable the regions to work towards development of their own specific needs.

## Technology

In terms of technology, Kenya hosts the largest Information Communication and Technology (ICT) sector in Africa (World Bank, 2016). Mobile subscription had increased to 37.8 million by September, 2015, representing 82.1% of the population. Kenya is well known both regionally and internationally for its popular mobile phone based money transfer program called M-Pesa. This service has given people access to the formal financial system and has reduced the burden and risk of carrying cash. This makes business cash transactions easier and less complicated. In addition, it has extended the access to rural households who are often too far away from areas offering financial services. Furthermore M-Pesa has also created employment for the upcoming youth population.

In Kenya and the Eastern Africa region, the e-Soko (e-Market) web-based system offers an agricultural commodity exchange platform. Farmers, buyers, service providers enlisted with the e-Soko system are provided with passwords so that they can send targeted messages via Short Messaging Service (SMS) to their farmers through mobile technology. ICT based platforms have been able to provide better support to agriculture value chains in ways such as supply chain management, financial services and information and agricultural trade services (AFCAP KENDAT & Partners Value-Chain Logistics, 2009).

## Public health, water and sanitation

Droughts are very frequent in Kenya and mainly affect the semi-arid to arid areas. This results in serious water shortages and poor sanitation which leads to outbreaks of diseases such as cholera and diarrhoea. Due to poor sanitation and hygiene, more than half of the population is at risk of disease and death, with over 75 percent of the country's disease burden caused by poor personal hygiene, inadequate sanitation practices and unsafe drinking water. Among children, diarrhoeal diseases and intestinal worm infestation contribute to a high disease burden and mortality with diarrhoea contributing to at least 40 percent of deaths among children under 5 years of age. As a result, approximately 19,500 Kenyans, including 17,100 children under the age of 5 years are dying each year from diarrhoea related illness – nearly 90 percent is directly attributed to poor water, sanitation and hygiene (Republic of Kenya, Ministry of Health, 2016).

## **Question 2: What examples of nutrition-sensitive value chain approaches can you share and what lessons can be learned from them?**

In Kenya, several examples exist of policies and projects surrounding nutrition-sensitive value chain approaches by various actors. In the following section, we have outlined and provided examples of recent approaches and projects implemented by the Kenyan government, which have also been incorporated in political decision-making and regulatory frameworks. In addition, we have provided examples from the development sector, using examples from development projects. We have also analyzed public-private partnerships, which are a fundamental component of achieving NSVCs. Finally, we have synthesized the lessons learned from a selection of studies and reports from the field.

### **2.1 Examples from Government: policies, regulatory frameworks, etc.**

The Government of Kenya (GOK) has implemented several policies and frameworks concerning initiatives to improve agriculture, food insecurity and malnutrition. However, despite these political frameworks, the GOK is faced with significant challenges in terms of political, economic and social

barriers that must be addressed in order to obtain long-term sustainable NSVCs and food security.

## Government Policy

The GOK published its leading policy document “Vision 2030” in 2007, emphasizing economic development and power devolution, while also outlining which actions are needed for the country, extensively covering food security issues (Republic of Kenya, 2013). Under this plan, the GOK vowed to “adopt climate-smart agriculture such as harnessing farm waste as a source of organic fertilizer, and the use of bio-fertilizer that does not contribute to harmful emissions, better weather forecasting and early warning systems, growing resilient food crops, managing post harvest losses and crop insurance” (p.51).

This Medium Term Plan however also set the ground for important frameworks and concise action plans with a focus on nutrition, including the National Nutrition Action Plan (NNAP), the Scaling Up Nutrition Initiative (SUN) as well as the National School Health Strategy Implementation Plan. Since 2012, after joining the SUN, the GOK has been working on multi-sectoral, legislative and constitutional initiatives to promote nutrition and is aiming to continue improving its institutional transformation. Furthermore, for 2016 and 2017, the GOK has been working on prioritizing the finalization and implementation of the Food Security & Nutrition Policy (FSNP) and completing the Healthy Diets Guidelines in order to address the double burden of malnutrition.

## Agriculture

In terms of agriculture, following the implementation of the Comprehensive Africa Agriculture Development Program (CAADP), the GOK has been improving agricultural reform for several years with the creation of an Agricultural Sector Coordination Unit (ASCU) that coordinates all ten agriculture-related Ministries. The GOK’s five-year investment plan in agriculture combined with a well-researched agriculture strategy and a newer constitution promoting accountability is promising for progress in the following decade (U.S. Government, 2011). It has however also been mentioned that Kenya is still focusing too much on improving agricultural productivity and has left nutritional and more holistic food security considerations, especially on distribution and access, only at the margin (Heinrich Böll Foundation, 2015).

## National Nutrition Action Plan (NNAP)

In 2012, The Government of Kenya implemented the National Nutrition Action Plan with the objective of providing a framework for coordinated implementation of nutrition intervention activities by government and stakeholders. Eleven strategic objectives (p. viii) were identified, including, improving the nutrition status of women of reproductive age and children under five, reducing micronutrient deficiencies, improving access to quality curative nutrition services, and improving nutrition in schools. The government also aimed to improve knowledge, attitudes and practices on optimal nutrition, strengthening nutrition surveillance, improving monitoring and evaluation systems, and strengthening coordination and partnerships among key actors (Republic of Kenya, 2012).

As part of the National Nutrition Action Plan, the GOK is working on implementing a Food Security and Nutrition Policy (FSNP) to provide an overarching framework covering the various dimensions of nutrition improvement. The FSNP was developed to coordinate existing initiatives of the GOK and partners, and also recognizes the need for public and private sector involvement (Republic of Kenya, 2012).



## National School Health Strategy Implementation Plan 2011-2015

In recent years, the Government of Kenya has been working towards improving education, specifically for school-aged children. Knowledgeable about the negative impact of poor diets combined with sedentary habits on children's health and their learning, a nationwide effort has been developed to improve nutrition education as well as integrating nutrition interventions including micronutrient supplementation into school activities (Republic of Kenya, 2011). In response to the reality of undernutrition and micronutrient deficiencies among children, the government identified key issues to be addressed including insufficient food varieties and consumption of non-nutritious food, lack of regular nutritional assessments in schools, lack of national coordination and monitoring and evaluation, and lack of knowledge on nutrition and the link between diet and disease (Republic of Kenya, 2011).

In the period between 2011 and 2015, the GOK implemented a school nutrition plan, targeting school children, teachers, school administration, communities, Ministries of Health, other Ministries and other stakeholders, with the objective of improving the nutritional status of school children nationwide (Republic of Kenya, Ministry of Public Health and Sanitation and Ministry of Education, 2011). Various strategies were set to address the key issues, including sensitizing all stakeholders on the importance of school nutrition services, ensuring all institutions have sustainable home-grown meal programs, strengthening mechanisms for sustainability of school nutrition services, and instituting comprehensive, effective, efficient and sustainable monitoring and evaluation systems for school nutrition services (Republic of Kenya, 2011).

### Recommendations going forward

However, despite these frameworks and policies, the GOK's nutrition policy and planning comprises a small portion of the health budget, is fragmented among several ministries and relies significantly on donor funds such as United Nations Children's Fund (UNICEF) to address nutrition and food insecurity issues (U.S. Government, 2011). According to the U.S. Government's Multi-Year Strategy in Kenya called Feed the Future, implemented from 2011-2015 in an effort to complement the GOK's efforts in improving agriculture, nutrition, and food security, it was found that Kenya has strong technical expertise to address agriculture and nutrition issues. However, this strength must be translated more consistently in the political arena to further improve important economic, political and social reforms (U.S. government, 2011). In addition, strengthening smallholders through collectivisation, tailored policy and access to markets, finance and information is imperative (Heinrich Böll Foundation, 2015), an area that TechnoServe in the following section (2.2) is working on.

## 2.2 Examples from Development Actors & Projects

Currently, the number of development projects encompassing NSVCs in Kenya is quite limited. However, the few existing projects provide a good opportunity for understanding how FVCs in Kenya can be expanded to be more nutrition-sensitive, and thus potentially improve the situation for a significant number of people in Kenya who are nutritionally vulnerable. In the following, a research project called LANEA, a development project from the German BMZ, the Changing Course in Agriculture initiative, as well as Technoserve, a non-profit organization based in Washington DC, will be presented with their own approach to NSVCs. Using these projects as examples provides a sound overview of the type of involvement of the development sector in Kenya's food system.

## Leveraging Agriculture for Nutrition in East Africa (LANEA)

Leveraging Agriculture for Nutrition in East Africa (LANEA) is a research study conducted in three countries: Ethiopia, Kenya, and Uganda, all belonging to the SUN Movement (Scaling Up Nutrition). The study was conducted between October 2013 and July 2014 and involved a review of agriculture-nutrition pathways in each country. The aim of the project was to gain a better understanding of the environment which is necessary in order to influence nutrition through the food and agriculture sector. The objective of the study was to analyze the perceptions of stakeholders on the existing links between nutrition and agriculture, of the challenges and opportunities presented given the political and institutional frameworks, and of evidence that could be useful for policy making. Study participants included civil society, government, non-governmental agencies, UN and donor agencies, research institutes and universities, as well as the private sector (Hodge et al, 2015).

The study concluded that while many opportunities exist to strengthen the role of nutrition in agriculture in East Africa, stronger implementation of policies require a number of factors, including: sufficient human resources, access to financial sources, reliable and timely data, coordination and alignment of various sectors in the context as well as on priority actions, and aligning frameworks and indicators with accountability (Hodge et al, 2015).

## Making value chains work for food and nutrition security of vulnerable populations

A specific development project was implemented in Kenya in 2015 by the BMZ (German Ministry for Economic Cooperation and Development) called ‘Making Value Chains Work for Food and Nutrition Security of Vulnerable Populations in East Africa’. The objective of this three-year project was to link smallholder-based production systems in Kenya to informal markets in order for people to have access to food in a more affordable, safe and nutritious way, thus taking into account social and economic factors (Van Loosen, 2015). This project can be extremely beneficial in terms of nutrition sensitivity as the development, production, distribution and marketing of foods does not typically focus on the economic and social circumstances of consumers at the base of the wealth pyramid.

The main objective of the BMZ project was to improve the diets of vulnerable rural and urban consumers at the base of the wealth pyramid, specifically women of reproductive age and children 6–59 months old. *“The challenge is to provide vulnerable groups with dietary diversity by combining beans with underutilized foods such as amaranth leaves that can improve nutrition”* (Van Loosen, 2015). The project aimed to make a nutrient dense bean-based porridge affordable for the whole population and to ensure that a marginalized family would be able to diversify their diet through the inclusion of beans, vegetables and cereals in every meal. This could lead to an increase in micronutrient intake and have a positive impact on diet diversity and quality. The purpose of the project was to facilitate a participatory process including both private sector and project partners, while the aim of the project was to work on improving the supply, price, quality, and diversity of foods as well as to increase the accessibility, affordability, and convenience of the nutrient dense bean based products for vulnerable populations, which have been produced by small and medium enterprises (SMEs) (Van Loosen, 2015).

## Changing the course of agriculture in Kenya

The Changing Course in Global Agriculture (CCGA) initiative is carrying out valuable work in Kenya and has raised support from the Swiss Agency for Development and Cooperation (SDC) and the International Fund for Agricultural Development (IFAD). In Kenya the project is currently in its second phase (2015 – 2017). CCGA aims to strengthen the policy support for sustainable agriculture and food

systems at the national and international levels and the project is implementing three core activity lines on policy coherence, governance, and civil society strengthening in Kenya. The project works with national authorities in defining national policies and strategies that allow for effective and comprehensive planning with the aim of fostering systems that achieve food and nutrition security combined with economic growth and environmental stability. In Kenya, CCGA has introduced the T21 model, an integrated and dynamic planning tool that provides information for effective, comprehensive and long-term policies supporting a sustainable agriculture.

## Technoserve

Technoserve, a non-profit organization works with a mission to “leverage the power of the private sector to alleviate poverty” through linking people to information, markets and capital. In Kenya, they have implemented a project involving the mango value chain. It is estimated that post-harvest loss of fruits accounts for 50% of total post-harvest losses in Kenya, throughout various steps of the value chain. The project carried out by TechnoServe aims to minimize these losses in post-harvest surrounding fruit and thus focuses on the reduction of inefficiencies and on the extension of the fruit’s shelf life to increase the income of farmers.

Poor harvesting practices, high temperatures, poor transportation and fruit flies have been identified as the main challenges for Kenyan mango farmers. Since the quality and the quantity of the harvest is being reduced by bruised fruit and is consequently reducing income, the training of smallholder farmers on harvesting and packaging techniques, as well as the introduction of refrigeration technologies has helped to increase farmers income and the amount of mangoes available in the market. Furthermore, solar drying facilities offer an opportunity of product diversification for this fruit, such as the production of mango powder and crisps. Therefore, this value-adding activities bears promising income potential (Kirema, 2017).

## 2.3 Examples from Public-Private Partnerships (PPPs)

Public-private partnerships (PPPs) are essential in implementing and improving nutrition-sensitive FVCs, particularly in the case of Kenya. PPP projects, outlined below, are currently underway in Kenya, and provide an opportunity to improve the nutritional component of FVCs.

In 2013, following the issuance of the National Public Private Partnership policy in 2012, the Kenyan Government enacted the Public Private Partnership Act, which aimed at establishing a Public Private Partnership Unit (PPPU) within the National Treasury and strengthening the legal framework for PPPs. The Kenyan National Treasury outlines that the country is facing major challenges in finding the capital for new modern infrastructures (that the PPPU deems essential for the growth and prosperity of the nation) and for its social and economic development obligations. The PPPU estimates that the gap between the needed investments and the available resources can reach 3 Billion US dollars per year (Rotich, 2017).

Two projects are currently underway according to the PPPU of Kenya website (PPPU Kenya, 2013). The first project is the Independent Power Producers Projects, which aims at building thermal, geothermal and wind power plants (rain independent sources) and ensuring the production of electricity throughout more frequent droughts. This project is leading to an increased offer of energy and a reduced electricity price for households and industrial consumers (Richardson, 2015).

The second project is the Rift Valley Railways, the fusion of the Ugandan and Kenyan railways and the concession of the “assets to the private sector so as to improve the management, operation and financial

performance of the two rail networks in a coordinated manner” (PPPU, 2017). According to the PPPU’s website, this new consortium will also help the neighbouring landlocked country of Uganda to gain access to the Kenyan seaport of Mombasa. If well managed, Kenya could also enjoy the benefits of a more efficient railway system transporting its goods inside the country as well as to the export market (PPPU Kenya, 2013).

## Irrigation

According a Reuters interview with the principal secretary for irrigation in Kenya’s Ministry of Water, Patrick Nduati, the Kenyan government would like to increase the country’s agricultural production thanks to irrigation, by installing irrigation systems on 100,000 additional acres of land every year until 2030 (Rioba, 2016). According to the reported interview, the government is planning to invest in such systems as well as in the quest for new sources of water for irrigation, such as “rainwater” and “reuse of wastewater” (Rioba, 2016). In addition, the Kenyan government is working on incentivizing a technological spill in the fields to overcome the effects of consecutive years of drought, which affects both smallholder farmers and pastoralist communities.

In terms of products to improve irrigation, a new solar powered water pump called the Future pump has entered the market. More than 200 of these pumps have been sold in Kenya, allowing the farmers to rely on the benefits of less expensive solar power rather than solely on high cost fuel-powered technology as well as the scarcity of rain (Rioba, 2016). Patrick Nduati said to Reuters “the government is not charging value-added tax on such solar kits, and that the country’s draft National Irrigation Policy proposes offering more incentives to farmers to buy such devices, including lower import taxes” (Rioba, 2016). However, while these solar-powered water pumps offer many benefits for agriculture and for the improvement of nutrition-sensitive value chains, they remain unaffordable for many farmers.

## The first mile challenge

An additional challenge presented in Kenya is the inefficient transportation from farms to storage facilities, markets or consolidation points. This portion of the value-chain is essential to increase nutrition and could be improved through PPPs, including at the smallholder farmer level. Adapted resources are needed to ensure the connection of the smallholders to the market and to help in reducing crop losses. For example, the so-called “first mile” challenge for Kenyan onion producers has been analyzed in 2014 by a team of researchers from the UK Department for International Development. Their paper, *Overcoming The First Mile - Lessons From Farmers in Kenya & Tanzania*, revealed that Kenyan farmers have tried to overcome the challenge but did not succeed (Hine, Njenga & Wilolo, 2015). The conclusion of the report offered the following:

“Because of a lack of direct road access, farmers in Kenya and Tanzania face major issues in moving their produce on the First Mile leg of the journey to market. Head and back loading as well as motorcycle transport is used for this journey which can be over 20 times as expensive, per ton km than by truck. A very high proportion of farming income is lost, typically ranging from 10% to 40%, as a result. Beside the transport costs, farmers also face high losses as crops are bruised, damaged and spoilt as the crops are manhandled and get wet in these initial journey stages. In the wet season transport becomes more difficult and often transporters do not turn up on schedule and further losses result.” (Hine et al, 2015).

In addition, “To deal with this issue two-fold solutions are required to both improve tracks and roads so the trucks can pass and secondly to help farmers consolidate loads so that benefits of economies of scale in transport can be achieved and lower transport costs can be passed onto farmers. In Kenya it was found

that small scale technical advice to help local groups improve track accessibility, through a ‘spot improvement’ approach would be extremely beneficial.” (Hine et al, 2015).

PPPs, particularly in terms of rural roads and infrastructure, could benefit nutrition-sensitive food-value chains. In 2016, the Kenyan government announced four PPPs for new roads (PPP Knowledge Lab, 2017), however, these projects are mainly to be constructed between Nairobi and the coastal city of Mombasa, and thus will not directly benefit the remote farmers. If properly negotiated, additional PPPs could be beneficial to improve rural infrastructure and could assist in maximizing the agricultural and transportation related aspects of the nutrition-sensitive food-value chain.

## **2.4 Examples from Private sector:**

As demonstrated in the previous section on PPPs, the private sector is essential in creating NSVCs in Kenya. Outside of the PPP framework, the private sector can be utilized to implement initiatives to fill gaps in nutrition, agriculture and FVCs based on their areas of specialization. According to the World Health Organization (WHO) protein-energy malnutrition represents the fourth cause of death in Kenya (WHO, 2015). Micronutrient deficiencies, specifically vitamin A, iron and zinc are among the main causes of deaths in developing countries, a reason why food fortification is at the top of the Government of Kenya’s agenda to fight hidden hunger (WFP, 2016).

### **Fortified flour**

Flour is used in many dishes in Kenya, and therefore is an important component of the food supply and of FVCs. However, flour is often lacking in micronutrients. Therefore, private companies such as United Millers have committed in 2012 to fortify flours and oils with the nutrients mentioned above as well as with vitamin B and folic acid (United, 2017). Although a fortification policy for maize, wheat flour and vegetable oils was enacted in June 2012 by the government and is being monitored by the Kenya National Food Fortification Alliance (KNFFA) and coordinated by the Ministry of Health, people from the rural areas still have limited access to fortified flour (Technoserve, 2017; WFP, 2016).

For NSVC to become truly effective and inclusive, it is important to recognize and account for the critical role of and added value of small farmers in addition to the importance of private companies. The Global Alliance for Improved Nutrition (GAIN) recognizes the importance to enhance the participation of small scale producers but considers the compliance of large scale producers as a challenge. Furthermore, the World Food Program (WFP) launched a two-year pilot project in 2014 focusing on small scale farmers and millers. Small scale millers were demanding their sorghum and maize grains from regional farmers around the Kakuma refugee camps to make flour. This flour was then fortified and utilized to prepare warm meals for children attending school in the refugee camps. This project resulted in approximately 60,000 children receiving a warm meal (WFP, 2016).

Furthermore, it is crucial to provide education and health promotion to the Kenyan population surrounding the concept and benefits of fortified food, and thus create a demand for fortified products in the market. This is also important in order to avoid misconceptions among consumers of what fortification means as well as confusion on packaging labels identifying enriched products (GAIN, 2017).

### **Amsterdam Initiative Against Malnutrition (AIM)**

International organizations and NGOs are often the main actors building alliances between stakeholders and creating networks for improved nutrition. As an example, The Global Alliance for Improved

Nutrition (GAIN) began the Amsterdam Initiative Against Malnutrition (AIM), bringing together different stakeholders through a broad portfolio of projects. The aim of this initiative is to improve food security through the entire food value chain through consumers, using market-based strategies. With GAIN acting as the coordinator of this initiative, AIM includes 30 stakeholder partners who explore and implement innovative and sustainable solutions to address malnutrition. The AIM initiative functions at various levels of FVCs including farmers, processors, supermarkets, and health clinics, with local partners leading all projects utilizing a bottom-up approach, which has proved to be more successful than other approaches (GAIN, 2017).

The majority of AIM projects are subsidized by government funding, at least for the initial phase, and are cofinanced by private sector for the development of new products. AIM provides an arena for private partners and other organizations to work together and strengthen projects. A variety of projects have been implemented through AIM in Kenya and include “Smartlife”, “Fortified dairy“, “Vegetables for all” and “Improve nutrition in cash crop value chains”. More specifically, Unilever has implemented the project Smartlife through AIM, which focuses on delivering clean water, nutrient-rich food and hygiene products. This combination of products aims to ensure that the positive effects of a healthy meal are not hindered by diarrhoeal diseases (AIM, 2014).

An additional AIM project called “Fortified Dairy” focuses on providing incentives to firms to fortify their dairy products. This is an important initiative in Kenya since milk is an important component of Kenya’s diet and the regulations concerning the fortification of dairy have not yet been adopted formally. The project is being carried out with the hope that local cooperatives will adopt the new standards as the demand for fortified dairy products increases. A local partner, Kinangop Dairy Cooperative was the first cooperative to begin fortifying their dairy products, which has led to them having an advantage in the market. (AIM, 2014).

The “Vegetables for all” project, also included in the AIM initiative, aims to intervene in the full value chain. The project aims not only to improve the quality of seeds, but also facilitates access to credit for smallholder farmers, trains farmers on the best agricultural practices and sensitizes consumers. For this reason, the cooperation of several companies in different stages of the value chain is essential. Beginning with the delivery of a variety of seeds by Rijk Zwaan, a private company specialized in vegetable seeds; and the facilitated access to finance through the Rabobank, the entire value chain is being improved, including transportation and storage. In addition, the sensitization of consumers at the end of the value chain is being improved through health awareness campaigns, which aim to create a higher demand for nutritious vegetables (AIM, 2014).

## Sopa Supplies with Technoserve

Multiple projects exist in Kenya surrounding product diversification and the enhancement of technology to increase production for small businesses. More specifically, Sopa Supplies, a maize-milling family business in Kaimbu County, began as a small maize business, has grown over time, and has expanded to become a large local producer of both maize and porridge flour. Although the porridge flour produced by Sopa Supplies created an added value in terms of nutrition, production capacity remained low (Graves, 2017).

In 2016, Technoserve, who supports small and local businesses through transfer of knowledge and technology, identified Sopa Supplies as a candidate to participate in the SAFE Program (Solutions for African Food Enterprises), in partner with USAID, PFS (Partners in Food Solutions) and a group of



leading world food companies including General Mills, Cargill, DSM, Bühler, Hershey and Ardent Mills (Graves, 2017). Technoserve provided Sopa Supplies with training in business concepts, nutrition including food fortification and hygienic measures. As a result, Sopa Supplies was able to increase the volume of its production. The company now has a multiple year strategic plan and is able to grow more maize and aims to supply larger quantities to organizations such as WFP, while continuing its contribution to the supply of the local market with the aim of improving food security (Graves, 2017).

As demonstrated in the previous examples, facilitating access of farmers to markets plays a key role in the fight against malnutrition and thus improving nutrition. In this aspect, the private sector bears a great potential for encouraging NSVCs. Besides improving market access, according to Wageningen (n.d.), the private sector could intervene in several ways including: reducing product costs through more efficient supply chains, raising awareness of the benefits of nutritious food, producing affordable fortified products, and using distribution systems to increase the availability of nutritious food, which plays a crucial role in reaching a more favourable nutritional status within communities.

Nevertheless the challenge is to give the appropriate incentives to firms and identify win-win scenarios between farmers, companies and consumers. In literature, this is known as an inclusive business strategy, in which marginalized people are involved not only as consumers but also as producers in the value chain. *“The idea behind inclusive business is that developing business and fighting poverty can go hand in hand”* (Gradle & Knobloch, 2010). Other identified difficulties faced by companies when trying to engage in inclusive business are: *“lack of market structures, limited number of success stories, time-consuming and costly processes, the need to work with non-traditional partners, and a high level of complexity”* (Kivuitu & Njino, 2014).

Further examples of NSVC approaches in Kenya’s private sector are underway, however, describing them in detail would go beyond the scope, nonetheless they are worth mentioning. For example, Fintrac, a consulting company is currently carrying out projects in Kenya to improve farmers access to markets of specific fruits and vegetables as well as spices, and is supporting the bottom of the pyramid market (Kivuitu & Njino, 2014). In addition, Honey Care Africa Ltd. is a Kenyan firm committed to working with rural communities to help disadvantaged people improve their living conditions (Honey Care Africa Ltd, 2015).

As outlined, there are several examples from the private sector in Kenya that contribute to various aspects of NSVCs. However, each program or project appears to focus on a specific aspect of the NSVC and thus coordination between various projects is needed in order to improve a NSVC approach overall.

**Question 3: Does the framework as presented in the discussion paper help you identify barriers and opportunities for nutrition-sensitive value chain development? What other knowledge products would be needed to render the framework more operational?**

### **Barriers and Opportunities for nutrition-sensitive value chain development**

The framework as presented in the discussion paper is very useful in identifying barriers and opportunities for nutrition-sensitive value chain development, particularly in the case of Kenya.

#### **Traditional Food Value Chains**

Implementing a modern, formal, linear and commercially focused NSVC framework as presented in the

background document may lead to significant challenges in a country such as Kenya where more traditional and informal FVCs provide not only significant sources of income and nutrition, but also act as vehicles for social exchange and education. Mason and Jayne (2009) in Gomez et al. (2013) state that “in Kenya, 66 percent of staple foods are purchased in traditional FVC retail outlets”. In addition, Jabbar et al. (2010) in Gomez et al. (2013) outline that evidence in Kenya surrounding camel milk and meat indicates that traditional FVCs remain the primary point of access, particularly for low income households, especially in terms of micro-nutrient rich foods such as fruits, vegetables, and meat. Thus, it has been demonstrated that traditional and informal markets and food chains are essential elements of food security and nutrition particularly in developing economies such as Kenya.

In addition, Gomez & Ricketts (2013) found that the transformation of more traditional FVCs to modern FVCs, particularly in developing countries can lead to nutritional challenges including an increase of over-nutrition problems for urban populations. More concerning is that this transformation has been shown to have little nutritional impact for rural residents and the urban poor, who depend primarily on traditional FVCs for both food security and nutritional value. In addition, the leveraging of traditional distribution networks by modern food manufacturers has been shown to increase access to low-priced processed foods in rural and low-income areas, leading to a mixed impact on the triple burden of malnutrition. Thus, the implementation of a traditional NSVC can have potentially negative impacts on nutrition rather than improve malnutrition when the wrong targeted group is affected by the intervention.

### The Informal and Formal Dairy FVC in Kenya

Informal and traditional dairy markets and value chains currently have many advantages over the formal sector. Estimates shows that 55% of all milk produced in Kenya is marketed, however only 20% percent of the marketed milk is sold in the formal markets. Farm gate prices are largely equal in formal and informal markets; however, the informal market has one big advantage compared to the formal market. The advantage being that the informal market is a cash-based market, hence the farmers are paid immediately for their products, while in the formal markets the farmers might wait up to one month to receive the payments. Thus, the preference for selling into the informal market is driven by the cash payment, which is used by the farmers to meet their daily needs (TechnoServe Kenya, 2008).

In addition, in the informal markets, there is no quality control which allows farmers to sell milk that would be rejected by processors. In the formal market, milk must be cooled for 2-4 hours after milking, while in the informal market, milk is not cooled at all. Since milking should be conducted in the morning, milk collected in the evening is of poor quality especially when received by processors and hawkers in the next morning. Thus, processed milk quality is lowered and processors are prevented from producing long life products that need a high-quality input (TechnoServe Kenya, 2008).

In terms of quality in the dairy FVC in Kenya, transportation is another obstacle that stands in the way to achieving NSVCs. Due to the remote locations of most dairy producers as well as the undeveloped infrastructure, the major transportation mean used in delivering milk to processing plants in Kenya is the bicycle, and in some unreachable areas, donkeys. Bikers use plastic containers to deliver the milk, which do not ensure food, hygiene and safety standards (TechnoServe Kenya, 2008).

### Nutritionally Vulnerable Groups

As outlined in the section on opportunities and challenges, Kenya’s situation on vulnerable and nutritionally vulnerable groups is complex and is due to a variety of factors. In terms of child nutritional vulnerability, malnutrition continues to be a major problem among children with rates of under 5 stunting

at 26%, under 5 wasting at 4% and low birth weight of 5.6%. In addition, micronutrient deficiency plays a significant role among school children. Furthermore, 25% of women aged 15-49 years have anaemia whereas the rate of 0-5 months exclusive breastfeeding is only 61.4% (The Scaling Up Nutrition Movement. 2016).

This complexity presents a large challenge in implementing NSVCs in Kenya. Each nutritionally vulnerable group has different nutritional needs and requirements, and unique interventions must be implemented. Using a modern NSVC rather than building on already existing traditional FVCs will require a greater amount of resources including administration, research, and infrastructure. There is also a risk that a formal, modern NSVC framework focusing primarily on “nutritionally vulnerable” groups may negatively impact the nutritional needs of other vulnerable groups who are not targeted with the implementation of this framework. This could be particularly concerning in Kenya where high rates of poverty leave people vulnerable in other ways.

the framework presents an opportunity for promoting measures to prevent the inappropriate marketing of complementary foods for young children. In an ethnographic study on identifying interventions to help Kenyan mothers cope with food insecurity, it was found that in two villages, caregivers have well-developed ideas about special foods for infants but invest heavily in food acquisition for infants and young children from external sources such as shops, neighbourhood kiosks, markets or supermarkets. Foods purchased include millet, some mixed grain porridge flours, rice and small fish as well as the ingredients that are used to prepare foods for infants and young children (Pelto & Armar-Klemesu, 2016). Focusing on this aspect of the NSVC could be very beneficial for improving the nutritional vulnerability of children.

Furthermore, the framework presents additional opportunities to improve education on hygiene, sanitation and water safety, particularly related to children. While consumer nutrition education is important, often child malnutrition is complicated by other factors involving sanitation and hygiene. According to the Kenya Environmental Sanitation and Hygiene Policy (2016-2030), over 75 percent of Kenya’s disease burden is caused by poor personal hygiene, inadequate sanitation practices, and unsafe drinking water. In addition, among children in Kenya, diarrhoeal diseases and intestinal worm infestation contribute to a high disease and mortality with diarrhoea contributing to at least 40 percent of deaths among children under five years of age (Republic of Kenya, Ministry of Health, 2016). This aspect could also provide beneficial opportunities through NSVCs in improving the nutritional and health status of children.

## Food Safety

Food safety standards is a challenging yet integral component of implementing an NSVC, particularly in developing economies. In the context of Kenya, although significant progress has been made in the area of food safety, much work remains in improving food safety systems along the food value chain, from production to processing and distribution. In Kenya, consumers are encouraged to ensure their food comes from credible and trusted outlets, and a need remains to harmonize national standards with technical regulations and other standards in order to protect the consumer.

In 2016, Kenya was selected to champion the FAO/WHO Codex Coordinating Committee for Africa. This achievement provides Kenya as well as other African countries with the opportunity to implement Codex standards, enhancing international food trade and improving food safety. However, while the Kenyan Bureau of Standards has adopted over 200 Codex Food Standards and various codes of practice

to protect consumer health, the majority of these focus on hygiene practices, food handling and manufacturing. (KEBS, 2016). Thus, there is a need for improved coordination between stakeholders and various authorities including government regulators, agencies, and grassroots organizations to ensure food safety in all areas, and to enable Kenyans access to safe food, particularly from catering establishments, cottage industries, and foods such as “sukuma wiki” or collard greens (KEBS, 2016). In order to effectively improve and implement food safety standards, particularly in terms of NSVCs in the context of Kenya, it is essential to include smallholder farmers in the process, rather than solely implementing Codex standards at a global and governmental level.

## Women and Youth in Agriculture

The framework presented in the discussion paper presents challenges in the form of improving the significant roles of women and youth in agriculture and food chains in developing countries, specifically in Kenya. According to FAO (2011), the share of women in the agriculture sector in Eastern Africa is 50 percent and according to the CFS (2015), 43 percent in developing countries overall. Thus, in implementing a NSVC framework, both challenges and opportunities arise in addressing the important role of women. The CFS (2015) outlined that female smallholders frequently have less opportunities in accessing markets, resulting from specific constraints, and addressing these constraints is essential to ensuring equitable access to markets, as well as maximizing the essential role that women occupy in food security and nutrition.

According to the World Bank Group (2017), women typically own fewer assets than men, have less access to inputs and services, and to further complicate matters, equal access to resources does not guarantee equal returns for women farmers. In addition, women require specialized training, child care, and customized support to decrease their higher workload as farmers and caregivers. In the case of Kenya, both men and women were provided with agricultural technology training and agri-business development, and as a result, the earnings for women in these agricultural activities increased by 35 percent (World Bank Group, 2017). If the role of women in agriculture and smallholder farming in the NSVC was emphasized, this could lead to improved food security and nutrition, in addition to poverty alleviation as women tend to reinvest what they have earned (World Bank Group, 2017).

## Rendering the Framework More Operational

There are several factors that could render the framework more “operational”, particularly in the case of Kenya. The framework appears to function in a linear manner, typical of a modern FVC, however, as mentioned, this will prove to be a significant challenge in a country such as Kenya, which is composed primarily of traditional FVCs and informal markets. Thus, in a setting such as Kenya, a more flexible FVC, which includes promotion of traditional FVCs would help to create a more successful and operational framework.

In addition, lacking inter-sectoral coordination and underfunding were identified by Action Contre la Faim (ACF-International, 2013) as barriers in Kenya to nutrition-sensitive agriculture and food safety programming. Thus, promotion of inter-sectoral coordination mechanisms and multi-stakeholder platforms in addition to promoting spaces for lobbying for increased funding for NSVC interventions could prove to render such a framework more operational. Finally, while Kenya has several strategies on agriculture, nutrition, education, and economic development, it is imperative to link the strategies particularly on Agriculture Sector Development with Food and Nutrition Security, specifically by supporting small-scale farmers as the main influence on household nutrition.

#### **Question 4: What would you consider as the main barriers to - and enabling factors for - scaling up through replication, adaptation, and expansion of these models of interventions in order to benefit more people in a sustainable manner?**

In the previous discussions within our paper, a wide range of interventions have been discussed, some of which are directly aimed at promoting NSVCs, while others impact FVCs in a more indirect manner through targeted sectors related to wider food systems. It should however be noted that the interventions discussed are either still to be implemented or are ongoing, and information and evaluations on their performance are not yet available. However, evidence on the beneficial impact of interventions is a crucial factor with regard to the initial decision to actually scale up, and for the actual implementation of NSVCs (WHO, 2008). Although this lack of evidence creates challenges in defining the barriers and enabling factors for scaling up for each of these models, it is possible to identify aspects that could either support or constrain the scaling up of interventions in the field of nutrition and nutrition-related sectors in Kenya.

##### **Environmental factors**

First, the political environment significantly affects the extent to which upscaling can be implemented successfully. An important aspect is the need for ‘leadership, vision and values’ (Hartmann & Linn, 2008). For the scaling up of interventions to be possible and effective, leaders driving the process need a clear vision, and institutions should have a clear set of values, thus empowering staff and providing incentives to scale up successful interventions. If these elements are not present, then approaches will remain characterized by ‘short-termism’ and fragmented initiatives (Hartman & Linn, 2008). In the case of Kenya, a number of policy frameworks addressing nutrition and nutrition-related sectors have been implemented, such as the National Nutrition Action Plan in 2012, and the creation of the Agricultural Sector Coordination Unit. Yet, for instance, the fact that improving agricultural productivity continues to be the main focus of the government could imply that a holistic vision is lacking, as making value chains more nutrition-sensitive also implies mainstreaming nutrition in the agricultural sector.

An additional factor that is crucial for upscaling to be possible concerns the presence of a supportive policy framework. In the case of Kenya, this is highly relevant. In order for value chains to be nutrition-sensitive, many different sectors need to be involved – as is very well reflected in the framework of the RBA discussion paper. In addition, many different systems need to be in place. For example, if one aspect of the value chain, such as food safety standards has not been implemented or does not function adequately, it may still be very difficult to improve the “nutrition-sensitive aspect” of the food chain. In Kenya, nutrition has recently gained attention, which could assist in explaining why nutritional policies have been implemented but have not yet been well consolidated. In contrast, programs and projects often underpin policy reforms, and can allow for the effective implementation of a policy regime (Hartmann & Linn, 2008).

Furthermore, the extent of homogeneity of the population should be considered as it can significantly affect the prospect for scaling up. People’s needs and socio-economic and cultural conditions are, among others, essential in this regard (WHO, 2010). Regarding the needs of the population, scaling up of programs may become complicated as the Kenyan population is characterized by a high variation of nutrition vulnerability and poverty levels. Since the nature and the level of issues people are faced with are considerably different, models need to provide for this variation and allow for the context-specific adaptation. In addition to needs, culture must also be considered. Kenya is a multi-ethnic country with more than over 40 different ethnic groups (Kenyan National Bureau of Statistics, 2010), which may

complicate upscaling efforts for a variety of reasons, including different habits and perceptions on food. Also, the use of different languages may require significant adaptations in the model, and scaling up could be more time-consuming with more intensive efforts needed.

### Characteristics of the interventions

When looking specifically at the projects that have been discussed throughout our analysis on Kenya, it should be noted that several of these projects address only one or a few aspects of the FVC, and typically do not fully encompass entire FVCs. More specifically, the fortification of flour by United Mills constitutes a clear example. The fact that the focus of these interventions is quite narrow and the concepts rather clear, would allow for relatively easily upscaling of the initiative. Thus, a restricted focus could be an enabling factor. However, it is crucial to note here that this also entails limitations, as other aspects, such as access to nutritious food are being ignored while they are crucial for achieving the goal of improved nutrition. More specifically in the case of United Mills, rural people still lack access to the flour.

An additional example of a project with a limited focus concerns the one of Technoserve on post-harvest losses in the mango value chain. Although training farmers in harvesting and processing techniques has led to an increase in the income of farmers and the amount of mangos to be marketed, this does not automatically imply that consumers, other than the farmers themselves, actually have access to these foods or will buy them in general. The same applies to the ‘Fortified Dairy’ project.

When examining the interventions, it is striking that many of them are focused on the supply side of the food value chain, yet demand is a crucial factor if interventions are to be scaled up. Although these interventions may work in the specific context in which they are implemented, the question is whether the same or a similar demand exists as well in other places. In some cases, demand creation might involve substantial efforts (WHO, 2008), such as in the form of consumer education or awareness raising, hence adding an extra element to consider in the model. Furthermore, also demand in relation to economic and social accessibility of food should be considered. Therefore, this is an element that needs to be considered carefully in investigating opportunities for upscaling of supply-oriented approaches.

Finally, both the managerial and technical complexity of an intervention is a factor that can facilitate or limit upscaling. Simplifying and standardizing interventions facilitates scaling up. Some interventions are by their nature relatively simple. Projects with a more integrated approach including many actors, such as the ‘Vegetables for all’ project, which aims to engage farmers as well as consumers, automatically adds to its complexity.

In summary, there are several barriers and enabling factors for the scaling up of the models analyzed throughout our analysis on Kenya. However, the aspects identified in this section that can either support or constrain scaling up allow us to understand how food value chains in Kenya can be more nutrition-sensitive. Furthermore, throughout our paper, we have demonstrated the complexity of implementing NSVCs in a country such as Kenya, however, several opportunities exist for improving FVCs and food systems to become more nutrition sensitive, and thus focus on the nutritionally vulnerable.



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