SUMMARY FOR THE

FOOD FLOW LANDSCAPE ASSESSMENT FOR THE BMZ GROW

ENRICH PROJECT

REPORT

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This acknowledgement is endorsed by Move on Afrika.

Signed,

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TABLE OF CONTENTS

LIST OF ACRONYMS

AfCFTA	African Continental Free Trade Area
ASALs	Arid and Semi-Arid Lands
ASDP	Agriculture Sector Development Program
ASTGS	Agriculture Sector Transformation and Growth Strategy
AU	African Union
AUDA- NEPAD	African Union Development Agency- New Partnership for Africa's Development
BMZ	Federal Ministry for Economic Cooperation and Development of Germany
CAADP	Comprehensive Africa Agriculture Development Programme
CCARDESA	Centre for Coordination of Agricultural Research and Development for Southern Africa
CO2eq	Carbon Dioxide Equivalent
CSOs	Civil Society Organisations
DAP	Diammonium Phosphate
EAC	East African Community
ELRP	Emergency Locust Response Program
ENRICH	Enhancing Nutrition Services to Improve Maternal and Child Health
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FSRP	Food Systems Resilience Program
GAIN	Global Alliance for Improved Nutrition
GDP	Gross Domestic Product
GESI	Gender Equality and Social Inclusion
GHG	Greenhouse Gas
GPS	Global Positioning System
IGAD	Intergovernmental Authority on Development
IGRs	Insect Growth Regulators
ILRI	International Livestock Research Institute
KFC	Kentucky Fried Chicken
Kg/ha	Kilogram per hectare
KII	Key Informant Interview
KSH	Kenyan Shilling
LGBTQIA+	Lesbian, Gay, Bisexual, Transgender, Queer (Questioning), Intersex, Asexual, plus Other sexual orientations, gender identities, and expressions not specifically covered

	by the other letters, such as pansexual, gender non-conforming, or non-binary individuals.
LPG	Liquefied Petroleum Gas
M&E	Monitoring & Evaluation
MtCO2eq	Metric Tons of Carbon Dioxide Equivalent
MW	Megawatt
NACOSTI	National Commission for Science, Technology, and Innovation
NAPA	National Adaptation Programme of Action
NCPB	National Cereal and Produce Board
NCs	National Coordinators
NGOs	Non- Governmental Organizations
PMCs	Primary Milk Collectors
PwDs	People with Disabilities
RAs	Research Assistants
REC	Regional Economic Communities
SCAN	Supply Chain Analysis for Nutrition
SMCs	Secondary Milk Collectors
SMEs	Small and Medium-sized Enterprises
SOP	Standard Operating Procedures
SPS	Sanitary & Phytosanitary
SPSS	Statistical Package for Social Sciences
UAE	United Arab Emirates
UN	United Nations
UNICEF	United Nations Children Emergency Fund
USD	United States Dollar
WFP	World Food Programme

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 BACKGROUND

The BMZ Grow ENRICH Project, funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by World Vision in partnership with Anglican Development Services- North Rift Region (ADS- NRR) in Kenya, The Puntland Minority Women's Organisation (PMWDO) in Somalia and Kivulini Women's Rights Organisations in Tanzania addresses food insecurity and malnutrition in Kenya, Somalia, and Tanzania. The project, running from September 2023 to August 2027, focuses on strengthening food systems, improving maternal and child health, and promoting gender-sensitive interventions. It targets key regions – Elgeyo Marakwet (Kenya), Nuugal Region (Somalia), and Shinyanga District (Tanzania) – with the goal of enhancing nutrition, resilience and accessibility within food value chains. The initiative supports over 506,000 direct beneficiaries, addressing systemic barriers to food security and sustainability. The food flow assessment analysed production, supply chains, processing, and trade while identifying vulnerabilities and cross-border food flows.

1.2 CONTEXT OF FOOD SYSTEMS

Africa's food systems face complex challenges including climate change, rapid population growth, socio-economic disparities, and weak governance. Regional frameworks such as the Comprehensive Africa Agriculture Development Programme (CAADP) and the African Union (AU) Common Position on Food Systems aim to promote sustainable and inclusive agricultural practices. At the East African level, policies like the Agricultural Sector Development Strategy and the Food Systems Resilience Program (FSRP) guide interventions to improve market access, infrastructure and climate- smart practices.

However, reliance on rain-fed agriculture, limited mechanisation, and cross- border trade inefficiencies remain key barriers. In Kenya, agriculture contributes to 30% of Gross Domestic Product (GDP) and employs 70% of the rural population, but challenges such as high production costs and market inefficiencies persist. Somalia's food systems remain highly vulnerable due to conflict, weak governance and climate shocks, with reliance on livestock and small-scale farming. Tanzania, while a net exporter of staple foods, faces erratic rainfall, poor transport networks, and inadequate irrigation systems, limiting agricultural productivity.

1.3 OBJECTIVES OF THE ASSESSMENT

The Food Flow Landscape Assessment was conducted to examine food distribution, supply chains and value chains across the three countries. The objectives of the Food Flow Landscape Assessment will focus on:

1. **Mapping Food Distribution** by identifying and mapping the pathways through which food moves from production to consumption, including supply chains, transportation routes, and distribution networks.
2. **Evaluating Accessibility** by assessing how accessible food is to different populations, including underserved communities, and identifying barriers to access such as distance, cost, and availability.
3. **Assessing Sustainability** by evaluating the environmental impact of food flows, including energy use, waste generation, and carbon footprint, to recommend more sustainable practices.
4. **Identifying Inefficiencies or bottlenecks** in the food flow system that may lead to waste or increased costs and suggest improvements.

5. **Enhancing Resilience** by analysing vulnerabilities and proposing strategies for better preparedness for improved resilience of the food system to disruptions, such as supply chain interruptions or natural disasters
6. **Supporting Policy Development** by providing data and insights to inform policy decisions and strategic planning aimed at improving food systems at local, regional, or national levels.

1.4 METHODOLOGY

The assessment adopted a mixed methods approach, combining quantitative and qualitative data collection techniques. Data was gathered through desk reviews, survey questionnaires, key informant interviews (KIIs), focus group discussions (FGDs) and observation checklists. The desk review analysed existing literature, policies and reports. The questionnaires were administered to 1,290 respondents across Kenya, Somalia and Tanzania. 115 KIIs were conducted with key stakeholders, including policymakers, traders and community leaders. 57 FGDs were held to capture localised experiences of key stakeholders within the food value chains.

On- site observations of food systems, infrastructure, and market dynamics. Data collection was carried out between October and November 2024. The methodology adhered to ethical standards, ensuring Gende Equality and Social Inclusion (GESI) by incorporating diverse participants, including women, youth and persons with disabilities (PwDs). Data was analysed using SPSS for quantitative insights and thematic coding for qualitative narratives.

CHAPTER TWO: KEY ASSESSMENT FINDINGS

This section provides a summary of key findings derive from the food flow assessment conducted in Kenya, Tanzania and Somalia.

2.1. KENYA

Input Supply: Findings from the assessment established that majority of the producers engaged from Elgeyo Marakwet during this study source their farm inputs from local markets (65.9%), government (34.8%), outlets (21.9%), companies (11.4%) and farmer groups (5.7%). Despite the existence of these sources, 94.4% of the producers experience challenges including pricing where they mentioned that inputs like fertilizers, seeds, and seedlings are often expensive, making them unaffordable for many farmers. Input supply centres are often far from farms, leading to high transportation costs and delayed delivery of inputs.

Food Production: Most local communities engage in crop farming (81.7%) as a primary food production practice followed by subsistence farming (11.3%) and livestock farming (7%). Common foods produced were fruits which included mangoes, oranges, bananas, passion fruits. Vegetables included sukuma wiki (kales), managu, cabbages, spinach, kunde (cowpeas) etc and cereals which included maize, green grams, sorghum, beans, millet, wheat and peas. 76.6% of the producers engaged cited that climate change was the key issue affecting food production in their locality followed by pests (70.9%), shortage of farming land (43.3%), soil (13.5%) and land degradation (7.1%).

Food Transportation: Findings from the assessment noted that the most common modes of food transportation in Elgeyo Marakwet were trucks, motorbikes, bicycles and hand carts. However, the sector is impacted by infrastructure challenges, such as poor road conditions and fuel costs, which can cause delays or increase transportation expenses. Roads that are not well-maintained or are prone to damage especially in rural areas cause significant delays and increase transportation costs.

Food Processing: The assessment findings revealed that food in Elgeyo Marakwet is processed on-site (39.4%), outsourced (16.2%), and at factories (9.2%). Discussions with processors noted that food processing adds value to raw agricultural produce by increasing its shelf life, enhancing its nutritional value, and improving marketability. For example, processing maize into flour or snacks provides higher profit margins than selling maize grain directly. However, the cost of inputs such as energy, labour, and packaging materials are often high, reducing the profitability of food processing businesses.

Food Marketing: The findings noted that the majority of the producers engaged sell their produce at local markets (72.6%), at home (54.1%), by the roadside (19%), regional markets (6.3%) and national markets (1.4%). Key challenges mentioned that affected food markets in Elgeyo Marakwet from poor regulations on pricing, taxes, poor infrastructure, fluctuation of prices and insecurity. The traders engaged through consultative meetings noted that there have been incidents where producers have reported the challenge of middlemen exploiting their produce as there is a lack of regulation around pricing and fair-trade practices.

Food Consumption: At the consumption level, the findings noted that food consumption in Elgeyo Marakwet is influenced by a combination of traditional practices, economic factors, urbanization, and the availability of both local and imported foods. Economic pressures, especially among lower-income households, often lead to reduced food variety and reliance on cheaper staple foods like maize. Inflation and the rising cost of living have also made nutritious foods like meat and dairy products less accessible to local communities, especially in rural areas.

Food Waste and Disposal: On food waste, food waste often starts even before food reaches consumers. A large amount of food is lost due to poor post-harvest handling, inadequate storage facilities, and lack of proper infrastructure. Smallholder farmers, who form a significant part of the food production and agriculture sector, suffer from these losses as they lack access to modern farming techniques and preservation methods.

Policy Issues in Supply Chains: Kenya has drawn up several strategic documents and policies intended to guide the country towards achieving food security. However, there are challenges in coordination and resource allocation to support implementation. For example, budgetary allocation to the agriculture sector is approximately 3%, falling short of the 10% targeted in the Kampala Declaration. The case is also the same for county governments, where Elgeyo Marakwet County only allocated 2.7% of their budget for Financial Year 2024-2025[1] to agriculture.

2.2. TANZANIA

Inputs and Supply: The findings ascertained that the majority of the farmers in Shinyanga Region acquired their farm inputs from the local markets (88.3%), while from the government (12%), from companies (10.8%), outlets (7.9%) and farmer groups (2.8%). Affordability of agricultural inputs, particularly seeds and fertilizers, is a major constraint for farmers. Subsidy programs have helped to bridge the gap but were not always sufficient. Despite the huge subsidy program by the government, majority of farmers (84.2%) reported facing challenges in acquiring inputs.

Food Production: Majority of the producers in Shinyanga Region practised crop farming, livestock framing and subsistence farming. The findings noted that the type and choice of crops being farmed were majorly influenced by; the climatic conditions, soil fertility, availability of land, available capital, type of farm inputs (seeds, fertilizers) available, family consumption and market demand and cultural beliefs. Key challenges affecting food production were inadequate access to water resources, limited access to high-quality biofortified seeds, significantly impacting crop resilience and productivity, high cost of agricultural inputs, particularly seeds and fertilizers, soil degradation, pests and diseases.

Food Transportation: The finding revealed that majority of agricultural produce is transported by road due to the limited reach and capacity of rail and water transport systems. The main means of transportation are hand carts, bicycles, motorbike, physically by person and trucks. Key challenges cited that affect food transportation in Shinyanga include poor road infrastructure especially in rural areas and a lack of coordinated transport services and insufficient storage facilities along transport routes.

Food Processing: The finding established that food processing techniques vary widely, from traditional methods to modern, mechanized processes. Traditional food processing is prevalent in Shinyanga region, where methods like sun-drying, chopping, milling, sieving & sifting, packaging, washing/ cleaning, grading, cooking & heating, smoking, and fermentation are commonly employed to preserve food. However, key challenges like unreliable power supply, poor road networks, and inadequate water supply resulted to increase production costs, and this affects food processing processes.

Food Marketing: The findings noted that majority, 64% of the traders in Shinyanga Region were selling their products at local markets, followed by at home (62.3%), roadside (18.1%) and regional markets (1.3%). Informal markets are crucial for smallholder farmers who depend on them to sell perishable goods directly to consumers. Key challenges affecting food marketing in Shinyanga region included inadequate

[1] Elgeyo Marakwet County Budget FY 2024-2025

transportation and poor infrastructure, shortage of buyers or customers, long distances to reach markets, high taxes in the market, and limited knowledge of marketing strategies for farm produce.

Food Consumption: The findings noted that cereals, dairy products and meat from livestock were the main staple foods for a significant portion of the population. Common types of cereals consumed were maize, rice, sorghum, and beans, which compose the daily diet staple across many households, especially in rural areas. Factors like over reliance on staple foods, lack of nutrition awareness and cost of nutritious foods were affecting the dietary diversity of most consumers engaged in Shinyanga Region.

Food Waste/Disposal: The finding established that despite interventions by government and NGOs to promote better waste management practices, such as composting organic waste or converting animal manure into biogas, general lack of awareness and knowledge about sustainable waste management practices results in the continued reliance on traditional disposal methods that are harmful to the environment and public health.

Policy Issues in Supply Chains: The major policy gaps in Tanzania's food sector is the lack of an integrated approach to supply chain management. The supply chains are often fragmented and inefficient, with smallholder farmers facing difficulties in accessing markets due to poor infrastructure, lack of storage facilities, and inadequate transportation. Inadequate resource allocation was also noted as a challenge where Tanzania allocates 5.9% of their budget on agriculture which falls short of the 10% required under the Malabo Declaration.

2.3. SOMALIA

Input and Supply: The assessment established that 83.9% of farm inputs in Puntland were obtained from the local markets, government (17.5%), outlets (6.7%), farmer groups (8.8%) and directly from companies dealing with farm inputs (5.4%). 89.8% of the producers reported that they have challenges in accessing farm inputs. The major challenge was the prohibitive cost of the inputs and lack of adequate knowledge of the existing appropriate inputs.

Food Production: Livestock farming, particularly camel, goats, and sheep, is a cornerstone of Puntland's economy and food production. The main crops grown include sorghum, maize, beans, and vegetables. However, crop production is often limited due to unpredictable rainfall. Other key challenges cited included lack access to modern agricultural technologies, including efficient irrigation systems, machinery, and high-yield crop varieties for local farmers. Limited extension services or agricultural training make it difficult for farmers to increase productivity.

Food Transportation: The findings highlighted that the most common modes of transport for food in Puntland were trucks, hand carts, motorbikes and bicycles. Discussions with transporters noted that poor road infrastructure is a significant challenge affecting the timely delivery of food, particularly in rural areas. Insecurity and conflicts also result to inaccessibility of certain regions by food transporters. Extreme weather conditions such as high temperatures and floods were also causing transportation disruptions and negatively impacting food quality.

Food Processing: The assessment established that in Puntland, food was mostly processed on site (68.5%), outsources (15%) and factory (3.9%). Key actors involved in food processing cited by the respondents engaged included local traders, transporters, food safety and technologists, agricultural cooperatives and associations, packagers, retailers, cooperatives and factory owners. However, Puntland is faced with

processing challenges, as small-scale milling shops are the major available processing stations, and this has led to frequent losses among the producers.

Food Marketing: The findings noted markets in Puntland are typically open-air or wholesale markets, where food is sold by vendors and retailers. Main market actors included local open-market vendors, small retail stores, and wholesalers. Key challenges affecting food marketing in Puntland included poor infrastructure of available markets, poor road network which limits access and government policies such as import/export regulations, taxation, and customs duties.

Food Consumption: The findings revealed that dietary choices were heavily influenced by cultural practices and the types of crops grown locally. For instance, sorghum and maize are staple crops that dominate the diet. However, the findings also noted that the local diet, which lacks sufficient diversity and balance, has led to significant health issues, particularly malnutrition and anaemia, largely affecting mothers and children. The scarcity of essential nutrients such as proteins, vitamins, and minerals has resulted in poor health outcomes and a high prevalence of malnutrition in the area.

Food Waste/Disposal: The findings revealed that many local roads connecting the markets and farmers are impassable and this makes the transportation of farm products difficult. As a result, farmers keep their produce due to a lack of disposable routes to the market which results to spoilage of the farm products. The findings also noted that most local farmers, processors are not aware of modern methods of waste management, and they result to traditional methods which often are a hazard to the environment.

Policy Issues in Supply Chains: On implementation of food policies, the findings revealed that despite agriculture and food security being prioritized in National Development Plans, there is a need for policies that support farmers in adapting to changing weather patterns and promote irrigation techniques, drought-resistant crops, and agroforestry. Inadequate quality control policies also act as an impediment to the export of crops, livestock and other locally produced farm products as they fail to meet international standards.

2.4. BIOFORTIFICATION

Kenya: Kenya has mandatory food fortification regulation and quality standard for salt, wheat flour, maize flour, and edible oils and fats production. Kenya has made notable progress in promoting biofortified crops such as Nyota beans with the support of organisations like KALRO. However, limited access to information agricultural extension services and certified seeds remains a significant barrier to widespread adoption. Rural populations, where food insecurity and nutrient deficiencies are more prevalent, may not be aware of food fortification programs, or may not trust fortified foods due to misinformation or lack of education on the subject.

Tanzania: The Tanzania National Biofortification Guidelines 2020 were also developed to contribute to national efforts to reduce nutritional deficiencies as a significant public health problem among vulnerable groups[2]. Tanzania has achieved significant milestones in biofortification, particularly with vitamin A-ENRICHed maize and cassava, supported by government and research institutions like TARI. However, one of the main challenges hindering the production of bio-fortified crops in the community is the limited availability of seeds. While there have been efforts to introduce bio-fortified crops like sweet potatoes and yellow maize, the distribution has been insufficient.

[2] Tanzania National Biofortification Guidelines 2020

Somalia: Food fortification initiatives in Somalia are guided by the National Food Fortification Strategic Plan 2019-2024 whose objective was to improve nutritional status of people in Somalia, by combating micronutrient deficiencies through national food fortification for accelerated socioeconomic development. In Somalia, efforts are still in their early stages, with limited awareness and adoption of biofortified crops due to traditional farming practices, weak infrastructure, and limited access to improved agricultural inputs.

2.5 GENDER AND FOOD SYSTEMS

Kenya: Women in Kenya's food systems occupy a pivotal role, contributing extensively to agricultural production, food processing, and distribution. They manage key stages of production, including planting, weeding, harvesting, and post-harvest activities. However, these contributions are undermined by systemic gender inequities that limit their access to productive resources, such as land, quality farm inputs, and financial capital. According to the findings, cultural norms and legal frameworks significantly influence women's access to land, leaving many unable to secure ownership or long-term rights.

Somalia: In Somalia, women play an integral role in sustaining food systems, particularly in the household and community contexts. They are the primary managers of food security within their families, often ensuring the availability, preparation, and nutritional adequacy of food. Despite their critical contributions, Somali women face significant challenges due to systemic inequities and vulnerabilities exacerbated by conflict, weak governance, and recurrent climate shocks. Customary and Islamic laws often restrict women's rights to own or inherit land, leaving them dependent on male relatives.

Tanzania: Women in Tanzania's food systems are integral to agricultural production, food processing, and distribution. They participate actively in smallholder farming, which forms the backbone of the country's food supply, and are involved in cultivating staple crops such as maize, cassava, and pulses. Despite their contributions, Tanzanian women face systemic barriers, including limited access to land, credit, and agricultural inputs. Cultural and traditional norms often restrict women's land ownership, leaving them reliant on male family members for access to farmland which hinders their ability to engage in large-scale farming or adopt climate-resilient practices.

2.6 CROSS BORDER

While cross-border food flow in East Africa has significant potential, challenges such as policy inconsistencies, infrastructure deficits, and security concerns hinder its full realization. Cross-border food flow policies have made progress in reducing trade barriers and enhancing food security, but significant gaps remain in harmonization, infrastructure, and enforcement. Opportunities to strengthen cross-border food flow include policy harmonization, infrastructure investment, technology adoption, and empowering smallholder farmers and women traders.

Addressing these areas can create a more integrated, efficient, and resilient regional food trade system, enhancing food security and economic growth. Institutions like the EAC, EAGC, and AU must play a central role in bridging these policy gaps but stronger enforcement mechanisms and inclusive frameworks (e.g., Somalia's integration into EAC and AfCFTA) are essential for realizing the full potential of regional food trade.

CHAPTER THREE: CONCLUSIONS AND RECOMMENDATIONS

3.1 CONCLUSIONS

In Kenya, agriculture remains a primary livelihood source, with Elgeyo Marakwet County showcasing a mix of crop farming, livestock rearing, and subsistence practices. Challenges include climate change, limited access to quality inputs, and infrastructure deficits. Women play a critical role in food production and processing but face systemic barriers such as inadequate access to resources. Food supply chains are characterized by inefficiencies, particularly in transportation and market accessibility. The integration of technology, such as biofortified crops and mobile banking, offers promising avenues for enhancing productivity and resilience.

Somalia's food systems are among the most vulnerable in East Africa, with the Nuugal Region heavily reliant on livestock farming and small-scale crop production. Key challenges include recurrent droughts, weak governance, and limited infrastructure, which exacerbate food insecurity. The fishing industry, despite its potential, remains underdeveloped. Women are integral to household food management but are disproportionately affected by systemic vulnerabilities. Local markets are constrained by poor integration and high transportation costs, limiting producers' access to buyers.

Tanzania's Shinyanga Region demonstrates significant reliance on rain-fed agriculture and smallholder farming. Key crops include maize, cassava, and pulses, but erratic rainfall and pests like the Fall Armyworm present ongoing challenges. Livestock farming complements crop production but suffers from inadequate veterinary services and feed shortages. Women's participation in food systems is pronounced, with their contributions spanning production, processing, and distribution. Market access is improving, but transportation costs and infrastructure deficits remain critical bottlenecks.

Biofortification enhances the nutritional quality of staple crops, improving food security and public health across Kenya, Somalia and Tanzania. Key biofortified crops, such as vitamin A- ENRICHed sweet potatoes, iron- fortified beans, and zinc- ENRICHed maize, contribute to addressing micronutrient deficiencies. However, adoption remains low due to limited awareness, inadequate seed distribution, and weak market linkages. While Kenya and Tanzania have made progress through government and NGO- led initiatives, Somalia faces significant challenges due to weak governance and infrastructural deficits.

3.2 RECOMMENDATIONS

Kenya:

1. **Improvement of Infrastructure and Transport:** The findings indicated that investment in rural roads and transportation facilities would enhance farmers' access to processing plants. This would reduce delays in receiving raw materials, ensuring the timely and efficient transport of goods, ultimately improving the overall food supply chain.
2. **Enhance Adoption of Biofortification Practices:** Government and CSOs working in the food security sector should support the development of biofortified varieties of staple crops such as maize, beans, sweet potatoes, and millet, which are crucial to the Kenyan diet. Research can focus on enhancing the levels of essential nutrients such as vitamin A, iron, zinc, and folate.
3. **Enhancement of Training and Skill Development:** Training on the use of new technologies and techniques in food processing was seen as a key driver for improving product quality and operational efficiency. Stakeholders in the food value chain emphasized that a skilled workforce is essential for

minimizing waste and maximizing the potential of the food flow system, making it more sustainable and productive.

4. **Adoption of Modern Technologies and Innovation:** The findings emphasized the importance of integrating modern technologies like Biotechnology to improve the yield and resilience of crops like maize, beans, and cassava. Genetically modified crops can withstand pests, diseases, and harsh climatic conditions.
5. **Advocacy for Supportive Policies:** The stakeholders engaged highlighted the need for supportive policies that would enable a more favourable environment for food processors. Policies focused on reducing costs, offering subsidies for technological advancements, or improving access to funding for infrastructure projects would create a more conducive environment for growth in the food processing sector.
6. **Market Diversification and Targeting:** Findings from the assessment noted that understanding market dynamics is critical for improving food sales. Strategies like market research and segmentation to identify high-demand products and target specific customer groups. Seasonal discounts, bundles, and sourcing from local farmers were proposed to attract price-sensitive customers and reduce transportation costs.

Tanzania:

1. **Promote Climate-Smart Agricultural Practices:** Adopt and promote climate-smart agriculture practices across the sector to enhance productivity and environmental sustainability. This includes the use of drought-resistant crop varieties, improved water management techniques, and soil conservation practices.
2. **Enhance Adoption of Biofortification:** Encourage research and development of biofortified varieties of staple crops, such as maize, cassava, sweet potatoes, beans, and rice, that are rich in essential micronutrients like iron, zinc, and vitamin A.
3. **Strengthen Market Connections and Supply Chain Integration:** Develop programs like use of farm-to-market digital platforms that connect farmers directly with buyers, including processors, retailers, and exporters, to improve market access and reduce the layers of intermediaries. Implementing supply chain integration initiatives such as cooperative farming models can help achieve economies of scale, improve bargaining power, and reduce costs.
4. **Implement and Enforce Supportive Policies and Regulations:** Review and streamline agricultural policies and regulations to ensure they support the growth and sustainability of the sector. This includes policies that encourage investment in agriculture, streamline land ownership issues, and provide incentives for sustainable practices.
5. **Foster Public-Private Partnerships:** Encourage partnerships between the government, private sector, and non-governmental organizations to leverage additional resources, expertise, and innovation. The private sector can facilitate financing for programs aimed to empower local farmers while CSOs could design programs to train farmers on adoption of modern techniques of farming and biofortification.
6. **Invest in Infrastructure Development:** Prioritize the development and maintenance of critical infrastructure such as roads, irrigation systems, and storage facilities. Expanding irrigation infrastructure will decrease dependency on rain-fed agriculture, thus mitigating the impact of climatic variability. Develop crop zones based on soil types to optimize agricultural productivity and construct water storage structures like pans and check dams to address water scarcity.

Somalia:

1. **Financial Support and Education for Farmers:** Providing financial support through subsidies, loans, and access to credit is a critical recommendation for enhancing food production. Education and training programs in agricultural best practices, financial literacy, and business management were repeatedly emphasized in the interviews as crucial for empowering farmers to improve productivity and profitability in the long run.
2. **Infrastructure Improvement and Access to Markets:** The findings indicated that improving infrastructure, particularly rural roads and storage facilities, is essential to reducing post-harvest losses and enhancing market access for farmers. Better roads, storage options, and irrigation systems could significantly improve productivity and ensure farmers can sell their products at fair prices.
3. **Adoption of Sustainable Agricultural Practices: P**romoting sustainable farming practices, including conservation agriculture and organic farming, is crucial for improving soil health and resilience against climate impacts. The findings revealed that such methods can boost long-term productivity and environmental sustainability.
4. **Promoting Biofortified Varieties:** Local farmers and government should collaborate with agricultural research institutions (like ICARDA or CIMMYT) to develop genetically improved varieties of biofortified crops. Department in charge of Agriculture should also ensure that biofortified seeds are widely available and affordable to farmers across Somalia, especially in rural and conflict-affected areas, is crucial. Government and NGO partnerships can facilitate this.
5. **Promote Climate-Smart Agriculture;** Promote practices that are climate-friendly that minimize emissions or increase carbon sequestration where possible. Integrate renewable energy (e.g., solar pumps) into agricultural operations. Promote practices that conserve the environment and implement measures to protect water catchments and reduce land degradation.