

Background paper:

Transforming Ethiopian Food Systems:

Better diet quality, prosperity, and sustainability in a changing climate

5 February 2021

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1. Introduction

In this background paper, we introduce the prevailing food system in Ethiopia to identify challenges and opportunities that can inform actions for a positive food system transformation that promotes attainment of healthier diets, improving nutrition and health while avoiding negative environmental impact. It is an evidence-informed description that identifies key challenges that will inform a joint High-Level Roundtable discussion of the Government of Ethiopia and the Global Panel on Agriculture and Food Systems for Nutrition. The outcome of the roundtable discussions will be used to further develop the background paper into the Ethiopian food systems position paper and roadmap that is being developed in a parallel but overlapping process. These documents will inform the Ethiopia Food Systems Summit 2021 (EFSS-2021) and subsequently the United Nations Food Systems Summit 2021 (UNFSS-2021) and the Nutrition for Growth Summit 2021 (N4G-2021).

Ethiopia has a rich policy environment relevant to food system transformation. Any recommended actions for food system transformation should be positioned within the given policy environment to facilitate actions being taken up within existing policy and programme frameworks. Moreover, there is much research relevant to food system transformation that has been done by different stakeholders. It is important to align efforts and take a holistic view to transforming Ethiopian food systems. For this reason, **we take a nutrient-dense diet centered approach** informed by the need to deliver better nutrition and health for Ethiopia’s people, leveraging aligned partnerships across all

food system actors who can use sustainable healthy diets as the desired common outcome of positive food system transformation within the broader SDG focus on people, prosperity, partnerships, planet, and peace. We recognize the need to address environmental and planetary sustainability as important aspects on promoting prosperity and peace. The nutrient dense diet centered approach is informed by the following guiding principles,

1. the desired more nutrient-dense and healthy diets are used as inputs to inform what needs to change to deliver healthier diets for Ethiopian population through a sustainable food system,
2. diversified nutritious diets are accessible and affordable to the majority of the vulnerable populations equitably and inform the outcomes of food system transformation that ensure that trade-offs are avoided;
3. environmental sustainability and resilience are promoted across the entire food system from production to consumption;
4. The required dietary patterns, food safety, environmental sustainability, and resilience are used to monitor progress from production to consumption;
5. Economic development and poverty reduction through the agriculture sector promotes the desired food system transformation in a sustainable manner.
6. Effective partnership is promoted with local and international donors, development partners, private sectors, research institutes and academia and the community that have a stake in food systems transformation.
7. Government works with all stakeholders to create an enabling, peaceful and inclusive environment for food systems transformation.

The objectives of this background paper are therefore, to synthesize the available evidence to inform the required food system transformation in Ethiopia. The information will be used to 1) inform a High-Level Roundtable discussion between the Government of Ethiopia and the Global Panel on Agriculture and Food Systems for Nutrition; 2) develop an Ethiopia Food System Position Paper, 3) raise issues that should be included for the Ethiopian Food System Summit-2021 (EFSS-2021), the United Nations Food System Summit-2021 (UNFSS-2021) Dialogues for which game changing actions will be suggested, and 3) contribute to informing a food system roadmap being developed for Ethiopia.

2. Diets, health, and environment: What are the challenges Ethiopia faces?

In Ethiopia, while much progress has been made on increasing staple cereal production, productivity levels are still very low, and diversification to provide more nutrients dense foods like fruits and vegetables has been very limited. Ethiopia Demographic and Health Surveys (EDHS) show that some progress has been made to reduce undernutrition in the country. The prevalence of chronic malnutrition (stunting) has decreased from 58% to 37% between 2000 and 2019 (CSA & ICF, 2016; EPHI & ICF, 2019). The proportion of underweight children declined from 41% to 21% and wasting decreased from 12% to 7% during the same period (EPHI & ICF, 2019). However, Ethiopia's burden of undernutrition and micronutrient deficiencies are still among the highest in Sub Saharan Africa. The 2016 national

micronutrient survey also indicated that anemia, zinc, vitamin A, folate, and vitamin B12 deficiencies are at the level of public health concern. More than half of children at the age of 6-59 months (57%) and 24% of women aged 15-49 years were anemic (CSA & ICF, 2016). In addition to macronutrient and micronutrient deficiencies, Ethiopia is also facing increasing overweight, obesity and diet related non-communicable diseases (diabetes and cardiovascular diseases) that are emerging challenges particularly among the urban population. Twenty-two percent of women aged 15-49 are thin (BMI<18.5), while 8% are overweight or obese (CSA & ICF 2016) but higher in urban settings. Poor diets are in part to blame for this situation of multiple forms of malnutrition.

Dietary guidelines, irrespective of settings, have consistently recommended the consumption of a diverse diet to ensure optimal health and wellbeing. **According to the 2016 EDHS survey (CSA & ICF, 2016), only 12.8% of children 6-23 months of age met the Minimum Dietary Diversity of 5 food groups out of eight.** Although this represents an increase of 8 percentage points from 2011 figures (4.4%), the pace of progress is very slow and favored only the highest wealth quintile (Baye, 2021). Also of great concern is the limited consumption of nutrient-dense foods from groups like animal source foods (ASF), fruits and vegetables. Such diets devoid of ASF, fruits and vegetables have been associated with poor child growth, micronutrient deficiencies, compromised immunity, and poor cognitive outcomes. Besides other socio-economic factors, cultural and religious practices have often been given as reasons for limiting consumption of a nutrient dense diet by children in Ethiopia. But recent evidence has reflected that children's diets were of low quality, irrespective of the diverse Ethiopian agroecology. Largely pastoral regions of Afar and Somali had a similarly low MDD prevalence (<3%) to the agrarian regions of Amhara (CSA & ICF, 2016), suggesting that the drivers of diet quality are complex and may reflect several factors. The prevalence of MDD ranged between 2.6 % in Afar and 36.5% in Addis Ababa.

Although a minimum dietary diversity for women (MDDW) indicator has been developed, this has not yet been captured in routine nationally representative surveys like the DHS in Ethiopia. However, the endline NNP survey used it and reported that <20% of women met the MDDW (EPHI, 2015). The most recent synthesis of evidence from different parts of the country confirmed this low MDDW prevalence (Baye & Hirvonen, 2020). Similar to findings in children's diet, nutrient-dense foods like ASF, fruits and vegetables are still missing in the diet of women. **For example, only 2.4% of the adult population meets the WHO recommendation of five serving of fruits and vegetables per day (Baye & Hirvonen, 2020).** In contrast, salt consumption is above the WHO threshold of 5 g/day in every region of Ethiopia. The national average salt intake is 8.2 g/day (Challa et al., 2017). **The low diversity of the diet, food safety concerns, and the unhealthy trends of salt and sugar intake, could explain the increasing trend in non-communicable diseases,** on top of the already high prevalence of communicable diseases, that are stretching the health system. Indeed, about 5% of the adult population is diabetic and close to a third of the Ethiopian adult population have raised blood pressure. From 2009 to 2019 alone, cause of death and disability related to dietary risk factors have increased by 18% (GBD, 2019).

Foodborne diseases are the most direct health effect of unsafe food systems. Unsafe food causes billions of illnesses each year posing a health burden comparable to that of malaria (Havelaar et al, 2010). Most of this global burden (98%) affects developing countries and children less than five years of

age (40%). They also result in high costs to health systems and patients (Jaffee et al, 2019). Food systems that fail to offer safe food face barriers to accessing international markets and undermine the potential for economic development.

Although nutrition literacy is an important driver of dietary choices, consumer behavior is also influenced by the food environment, which is determined by the purchasing power of consumers, their income, the accessibility, and affordability of nutrient-dense foods. One in four (24.8 %) households in Ethiopia fall below the food poverty line and 25.5 % of individuals are food insecure. The proportion of households who have inadequate caloric consumption (<2550 Kcals per adult equivalent per day) constitutes 31% (24 % of urban areas and 33% of rural areas). Consequently, starchy staples that are the cheapest source of energy contribute the highest share of the energy intake (71.4 %). More expensive, but nutrient-dense foods like ASF, fruits and vegetables are thus rarely consumed. For example, the per capita milk consumption of Ethiopian adults is 16.6 kg per year, 7.5 kg of meat per year and vegetable consumption per capita stands at 50.2 kg per year. These figures are considered very low, even by Sub-Saharan African standards.

The unaffordability of nutrient-dense foods is a significant barrier to improving diet quality. According to the recent cost of the diet estimates for Ethiopia, three out of four Ethiopians cannot afford the minimum cost of a nutritious diet. A nutritious diet costs more than four times the cost of an energy only sufficient diet for a family of five, assuming two adults and three children (i.e., 111 birr versus 26 birr). This figure is even more striking for areas like the Somali region, where the minimum nutritious diet costs significantly higher (144 ETB) than the national average (111 ETB). **The change in prices by food groups seen in the last decade also illustrates that the prices of nutrient-dense foods have increased above general inflation figures, whereas the price of cereals remained stable, and those of oils and sugar declined (Bachewe et al., 2017).** This trend in prices is likely to continue favoring a predominantly starchy diet, but also could encourage increased consumption of sugar and oils, moving Ethiopia further away from the needed healthy diet. The price trends are also reminders that due considerations should be given when implementing fiscal policies and incentives (e.g., sugar/oil subsidies) that can have unintended consequences on diet and health.

Noteworthy is the clear picture that emerges when putting together data related to diet, prices, household incomes, and the food supply. Analyzing the food supply data of Ethiopia between 2011-15, Baye et al (2019) has shown that overall agricultural production has increased substantially, reaching a national production level of 3500 kcal/capita. However, this increase has come at the cost of more nutrient-dense foods, as reflected by the decreasing diversity of the food groups produced. Consequently, these **cereal-dominated, yield-focused agricultural policies might have contributed to the observed prices and the monotonous diets dominated by cereals.**

With one of the lowest per capita consumption of animal source food in the world (Shapiro et al., 2015), affected in part by traditional and religious dietary practices, the most acceptable sources of protein and micronutrients for millions of Ethiopians are legume crops. Despite the important role legume crops could play, they have received little or no attention in the country's agricultural development policies

and strategies. **Food system transformation processes that target improving diet quality must consider actions needed to increase production diversification, must include production and productivity of legume crops.** Recent developments elsewhere in Africa where biofortified high iron bean varieties have been developed offer opportunities for Ethiopia.

Given the above challenges, there is need for the food system to transform in such a way that,

- 1) productivity of staple and other food crops increases sustainably,
- 2) diversification increases to produce more accessible and affordable nutrient dense fruits and vegetables;
- 3) greater attention is given to developing staple crop varieties that are nutrient enriched.
- 4) availability and affordability of animal source foods increases through more productive and environmentally sustainable regenerative farming practices,
- 5) the food system delivers safe food in markets and
- 6) that consumption patterns driven by cultural and religious practices (e.g. limiting the intake of nutritious products) are addressed especially at critical times like the first 1000 days of a child's life, which includes pregnant and lactating mothers;
- 7) food system actions are taken to prevent the rise in overweight, obesity and diet related non-communicable diseases.

3. Why food systems must undergo a process of transition to deliver sustainable, people centered, environmentally friendly and healthy diets

Current food systems are no longer fit for purpose. With one quarter of the world's population unable to access nutrient rich and sufficient food, and a real risk of crossing multiple planetary boundaries due to agriculture and food systems, these food systems urgently need to undergo a process of transformation (Global Panel, 2020).

The Ethiopian food system will and is already transforming. With foreseeable rise in incomes, rapid urbanization, the development of agro-processing industries, and the significant increase of the Ethiopian population, the food system is transforming, but this transformation should be shaped in a way that supports the adoption of people-centered and healthy diets. The changing demography and rising incomes will increase demand for nutritious foods, but the arable land is not going to increase to meet this demand. There will need to be a shift to increase overall systems efficiency, and available natural resource would thus need to be restored, preserved, and used optimally to support sustainable healthy diets. This would mean using regenerative farming practices that preserve/restore soil fertility and using less chemicals (e.g., pesticides). The production should be diversified, and reforestation initiatives should reserve a great share of new plantings for fruit-trees. Effective ways of increasing livestock production, without leading to substantial increases in GHGs emissions should also be sought. The agro-processing sector that is growing would need to be shaped in a way that contributes to making nutritious and healthy foods accessible and affordable. The role of smallholder farmers should be

protected throughout this transformation. There is also the potential to use approaches involving sustainable intensification, and technology innovation

Ethiopia must therefore produce a more nutrient dense food basket for its population and increase the availability and affordability of nutrient dense foods. And it must do so while containing the environmental impact of agriculture. An assessment conducted in 2011 by Community Development Research for the Global Methane Initiative indicates that, while CO₂ and methane emissions (two of the most important greenhouse gases (GHG)) in Ethiopia have been generally very low, both types of emissions have been growing over the past decades, in parallel to the country's economic growth. **With the prospect of Ethiopia's agricultural sector expanding to deliver a more diverse and nutrient-rich food basket, it is to be expected that the contribution of the agricultural sector to the country's GHG emissions will grow.** The Government of Ethiopia has initiated a Climate-Resilient Green economy initiative (CRGE, 2011) that identifies opportunities to reduce the country's GHG emissions by 64% in 2030 compared to a business-as-usual scenario. This includes improvements in the agricultural sector. Because of the current low productivity levels for crops and livestock, the GHG emissions per unit of product is higher than with more efficient production systems. Therefore, **by increasing farm productivity, promoting adoption of more sustainable regenerative farming practices, and reducing food losses, GHG emissions growth could be curbed or at least contained, within the Ethiopian context.** For example, a recent assessment by FAO (2017) identified improved genetics and feeding as key strategies in the dairy sector to curb its environmental footprint, by reducing methane emissions and increasing production at farm level. The effects of climate change and environmental degradation are very visible in Ethiopia through recurrent extreme events of droughts and floods. Land and soil degradation is a challenge due to high levels of deforestation. Just increasing productivity is not enough, it should be done while seeking to improve production practices to become more regenerative to mitigate against land, soil, water, and forest degradation. It is important that the food systems transformation needed takes a holistic view and considers the above realities.

Ensuring the availability, accessibility, safety, and quality of nutritious foods at all times for all citizens is a prerequisite for the creation of a productive workforce, longevity of life, improved livelihoods and innovative capacity that would lead to fast economic, social, and sustainable development of a nation. This can be realized when citizens across all ages of the life cycle enjoy a healthy life, have better knowledge of nutrient rich foods, practice improved utilization of foods, ensure food safety and quality along the food value chain, avoid food and nutrient losses, develop food and nutrition emergency preparedness, and increase resilience capacity (FNP 2018). Food system wide behavior change is needed to foster changes that are helpful.

The Government of Ethiopia has been implementing coordinated and fundamental economic reform programs over the past decades. These economic reforms have resulted in encouraging social and macroeconomic developments. Ensuring food and nutrition security can play a significant role in sustaining the gains from the economic reforms and putting the economy on a solid foundation. To further speed up the overall economic development of the country that depends heavily on agriculture, optimal utilization of food system related policies and implementation of cost-effective food and

nutrition security interventions across the food systems in a sustainable manner are fundamental (FNP, 2018).

Foodborne disease (FBD) due to poor food safety needs some attention. Diarrheal diseases represent 93% of the total cases of FBD, 73% of the deaths and 70% of the FBD DALY burden, (Havelaar et al., 2010). Limited information is available on the cost of diarrheal disease in Ethiopia. A study focusing on infants from 0 to 59 months, found that out of pocket direct medical expenses for outpatient treatment of diarrhea were \$5, mostly on medication (Memire et al., 2017). Severe diarrhea accounted for 9.1% of the diarrhea cases and the mean in-patient cost for this was \$79 (mostly on medicines, supplies and bed-charge). The mean associated direct non-medical costs (mainly transport costs) were \$2 for outpatient care and \$20 for inpatient care. These are largely consistent with limited literature from other parts of Africa. Animal source foods and vegetables, the most nutritious and recommended foods, are responsible for most of the FBD burden. The extensive FBD described is an important reason why transforming food systems must have a food safety perspective.

Partnership for positive food environment

To deliver better nutrition and health requires effective partnership and investing in supporting the food industry (i.e., from production to retailing) on adoption of good food safety practices and promoting enabling policy environments that supports the private sector (largely formed of smallholder farmers and small and medium enterprises) to deliver on healthy foods. Strengthening food safety requires efforts on various fronts: (i) generate credible country-specific evidence on FBD and its impact in the country, (ii) develop risk-based country-specific strategies to address food safety challenges, (iii) support private and public food industry with training and technology, (iv) promote a supportive policy environment that puts healthy foods and food safety at the forefront of food systems development.

Because of the intergenerational impact of malnutrition, the food choices that adolescents make have an impact on the nutrition status of the next generation not only through their nutrition status but also through habitual choices they may make for their own families later in life. **Recent assessments of urban food environments around schools in Addis Ababa suggest that food environments in and around schools are not conducive for healthy food choices (Trübswasser, 2020).** Advertising and promotion of food and drink is mostly limited to sugar-sweetened beverages. The same could be said about the food environments of the communities within which these schools are embedded. Availability of foods and drinks within school cafeterias is also not in line with healthy diets. While vegetables are offered as part of some cooked meals, fruits are entirely missing, and sugar-sweetened beverages were available in most school settings (Trübswasser, 2020a). **Food system transformation must therefore aim to create food environments that are conducive to making healthy food choices.** Positive food environments can help promote the better food choices recommended in line with FBDGs.

4. Sustainable Healthier Diets as an entry point for food system transformation in Ethiopia

More sustainable healthier diets should be a key outcome area of food system transformation. **Food Based Dietary Guidelines (FBDGs) are recognized globally as tools that can help public and individual choices on positive consumption patterns that can improve nutrition and health outcomes.**

The FBDGs currently under development by the Ethiopian Public Health Institute (EPHI) define what a healthy diet in the Ethiopian context should be. They can serve to inform the minimum dietary standards that can promote improved consumption patterns and provide direction on the food system transformation needed to address diet quality effectively. The FBDGs are based on generic WHO principles for healthy diets translated using Ethiopia specific evidence to promote health by preventing all forms of malnutrition. The Ethiopian FBDGs have the following two main objectives: 1) Provide dietary recommendations for Ethiopians two years and older for increased diet quality, including diversity and food safety for optimal health; and 2) Promote broad food system actions supporting diet quality being sensitive to sustainability. Comparing present diets in Ethiopia with these guidelines, confirms both the poor state of diet quality in the country but also the need for the food system including the agriculture sector and food industry to provide a more nutrient dense food basket that is safe, accessible, affordable, and desirable to consumers. The guidelines also recognize the need for sustainability and resilience to be considered as well as the need for contextualization to sub-national settings. The first contextualization process for pastoralist settings is planned during 2021. Progress on consumption patterns in line with the FBDGs could, therefore, be used to monitor progress on food system transformation for impact on diet quality under different sub-national settings.

Using the FBDGs to guide the monitoring of Ethiopia's food system transformation could be possible because the FBDGs development process also includes development of a Healthy Eating Index (Bekele et al, 2020). In a parallel process a food systems transformation profile is being developed that will recommend indicators that could be used to monitor progress on food system transformation from a diet quality and sustainability perspective. When the roadmap and position paper for food system transformation for Ethiopia are developed the above considerations must be used to promote synergy and that diet quality is used not only as an input to inform the needed transformation but also as an outcome by which positive transformation could be monitored to direct progress over time.

The production diversity and regenerative agricultural practices that need to be adopted as part of the food system transformation can also be monitored in their ability to support the needed consumption patterns and sustainably as indicated by the FBDGs and the Ethiopia food system profile. This monitoring needs to include environmental and climate impact. Similarly, developments in the food industry could also be monitored based on their impact on consumption patterns. For example, based on the evidence generated on sugar consumption, **FBDGs could be used to set standards on sugar content of foods and drinks available or advertised within and around schools and to the public at large, to improve sugar consumption at population and individual levels.**

Therefore, taking a sustainable healthy diet centered approach can provide a holistic view from which to direct and monitor the foods system transformation process.

5. Ethiopia's policy environment in relation to food system transformation

A recent review on Ethiopian policies (Trübswasser 2020b) found a rich nutrition policy landscape in Ethiopia with malnutrition being addressed in multi-sectoral policy documents through nutrition-specific, nutrition-sensitive and infrastructure strategies. The policy instruments target different elements of the food system and related challenges and present an enabling environment that can be leveraged to foster positive food system transformation. In this section we describe selected policy instruments and the overarching objectives they address in relation to food system transformation.

The Government of Ethiopia has developed several policy and program instruments to operationalize its vision of ending stunting by 2030. **The National Food and Nutrition Policy**, that was passed into law in November 2018, guides the multi-sectoral and multi-stakeholder approach needed to address malnutrition and provides a policy framework for multi-sectoral governance of food and nutrition activities in the country (FNP, 2018). It also provides for the establishment of a Food and Nutrition Governing Body and an institutional arrangement (structure) from Federal to Kebele (village) levels with the leadership of the highest government decision makers at the different levels to govern and coordinate the implementation of the Food and Nutrition Policy.

The **National Food and Nutrition Strategy**, currently being finalized, is informed by the 10-year strategic plan outlined in the policy and defines key actions to be undertaken by the different sectors including agriculture. The strategy builds on the **National Nutrition Program (NNP II)**, which was signed by 10 State Ministers of relevant sectors (FDRE, 2016). In addition to the above policy frameworks the government has also developed a **Nutrition Sensitive Agriculture Strategy** (FDRE, 2016), **School Health and Nutrition Program, School Feeding Program, One WASH and Productive Safety Net Program V** (2021 – 2025) (MoA, 2014). Table 5.1 provides a list of policy instruments and their overarching goals as they relate to food system transformation. In 2015 the government also unveiled the **Seqota Declaration** which is an innovative government of Ethiopia commitment that serves as an accelerator for high impact nutrition-specific, nutrition-sensitive and infrastructure interventions to fast-track progress towards national, continental, and global nutrition targets (FDRE, 2016).

The Seqota Declaration (2015 - 2030), as a Government commitment to end stunting in children under two years by 2030, offers an opportunity to implement synergistic actions across different sectors. The Seqota Declaration's 15-year roadmap is divided into three phases each spanning a period of five years (Figure 5.1). The *innovation phase* (2016-2020) focused on the implementation of priority intervention packages that are being monitored and evaluated to generate learnings and evidence to inform the design and implementation of the *expansion phase* (2021-2025). The Expansion phase will reach more vulnerable woredas across the country before a *national scale-up phase* (2026-2030). The National scale up involves full-blown implementation of evidence-based, innovative, and sustainable multi-sectoral interventions. Given the above information, the Seqota Declaration provides a valuable platform within which to address positive food system transformation that can provide sustainable healthy diets

affordably with food safety, and environmental sustainability consideration. Implementation of the Food and Nutrition Strategy is accelerated through the Seqota Declaration.

The **National Nutrition Sensitive Agriculture Strategy** (NSAS 2016- 2020) targets different action areas to ensure accessibility of a diverse nutrient dense food basket for better diets with equity and sustainability considerations. The strategic objectives of the NSAS include 1) integrating nutrition into agriculture and livestock policies, strategies, programmes and work plans at all levels; 2) establishing and strengthening institutional and organizational structures and capacity responsible for planning and implementing nutrition sensitive agriculture; 3) increasing year-round availability, access and consumption of diverse, safe and nutritious foods of both plant and animal origin including nutritionally enriched biofortified staple crops; 4) enhancing resilience of vulnerable agrarian, agro-pastoral and pastoral households and communities prone to climate change and moisture stress; 5) ensuring women and youth empowerment as well as, gender equality in the actions that are taken, and 6) establishing and strengthening multisectorial coordination within the agriculture sectors and with signatories of NNP and other development partners. It is very clear that the given action areas address the challenges that have been alluded to in other sections above. It is therefore important that food system transformation takes these policy instruments into consideration and that the roadmap and position paper developed are structured to increase synergy to accelerate progress across the policy instruments that are presented in Figure 5.1.

Table 5.1 Selected Ethiopian policies and the overarching objectives with respect to food system transformation.

Policy/policy instrument	Overarching objective
National Nutrition Program (NNP II) 2016 - 2020	Ending malnutrition by 2030 through multisectoral coordination and collaboration with Agriculture being a key sector
National Nutrition Sensitive Agriculture Strategy (NNSAS) 2016 – 20	Improving nutritional status of children and women by increasing the quantity and quality of food available, accessible, and affordable and promoting utilization of diverse, nutritious, and safe foods for all Ethiopians at all times
Growth and Transformation Plan II (GTP II) 2015/16-2020	Economic growth and transformation leveraging agriculture as a key focus area and with nutrition stated a key outcome area
Agricultural Growth Program (AGP II) 2015 - 2020	Ensuring nutrition security through community participation
Productive Safety Net Program phase IV (PSNP IV) 2014	Social protection with resilience consideration for food security and poverty alleviation

Seqota Declaration	A government commitment to accelerate the ending of hunger and malnutrition by 2030 using innovative approaches and food systems considerations, targeting vulnerable rural & recently also urban settings
National Horticulture Development and Marketing Strategy 2017	Addressing gaps towards developing market value chains for fruit and vegetable production and consumption. This is currently available only in Amharic but is an important policy instrument
Food and Nutrition Policy 2019	Attain optimal nutritional status at all stages of life a level that is consistent with a high quality of life, productivity, and longevity of life.
Livestock Master Plan 2015	Presents investment interventions needed in the livestock sector that could help to meet the targets of the Growth and Transformation Plan II (2015-2020) of Ethiopia by improving productivity of the livestock sector and total production in the poultry, red meat, milk, and crossbred dairy systems. These investments are expected to reduce poverty among livestock-keeping households and increase the contribution of livestock to agriculture GDP. By increasing productivity, they will also reduce the environmental footprint of livestock farming per unit of produce.

Within the above policy environment, the Ministry of Agriculture is implementing nutrition sensitive agriculture interventions aimed at accelerating the end of hunger and malnutrition. Various agricultural strategies and packages have been revised to incorporate nutrition sensitive interventions that include a, fruit and vegetable strategy, crop development strategy, biofortification, livestock packages etc. Nutrition sensitive agriculture core competencies have been incorporated into the curriculum of higher learning institutions and ATVETC and efforts were taken to establish nutrition structures at all levels, but this has not been very effective. At the federal level, where there has been greater success, the nutrition case team at the Ministry of Agriculture has been upgraded to a Food and Nutrition Coordination Office directly accountable to the Minister of Agriculture. To address implementation capacity, a nutrition sensitive agriculture (NSA) training manual was developed, and various training and awareness creation forums have been conducted from federal to woreda (district) levels.

Other efforts include the preparation of nutrition sensitive agriculture documents including the **Nutrition Sensitive Agriculture strategy** and manual, promotion of the strategy and basic nutrition concepts as well as the implementation of NSA activities. In Seqota Declaration woredas the ministry has designed and constructed nutrition corners in selected model FTCs as a full-fledged training center consisting of, backyard gardening for NDC, livestock production units, rooms for cooking demonstration, display and training as well as post-harvest technology unit to introduce appropriate technologies to store, process and transport ND agricultural products.

The ongoing efforts incorporate nutrition into sectorial programs and work plans. There has been introduction of some nutrient dense crops in backyards and irrigation fields (fruits and vegetables, nutrient dense pulses, and cereals, biofortified crops such as, quality protein maize (QPM), orange fleshed sweet potato (OFSP) and Iron rich beans. Livestock production like dairy, meat and egg production have mainly focused on pregnant and lactating women (PLW) and households with children less than two years. The lessons learned will inform direction **on the needed** food system transformation.

Other Policy tools that could be considered for food supply are related to providing agricultural inputs, services, and technologies, expanding social cash transfers and education and information interventions to promote the production and consumption of diverse foods and strengthen the capacity of agriculture extension workers in nutrition-sensitive approaches.

On the prevailing food environment, improving food safety is an important objective of Ethiopian policy documents. This includes reinforcing regulations to ensure that food is produced, processed, or fortified locally with safety considerations by the food industry. **The Food and Nutrition Policy calls for implementing a legal framework for ensuring the safety and quality of foods throughout the value chain.** The Ethiopian Food and Drug Administration has been issuing regulations and directives to improve the quality and safety of food products in general, but also specific for infant formula, complementary foods, and food supplements. However, enforcement of these regulations should be strengthened. (NNPII) Regulatory instruments addressing other components of the food environment have been proposed only in a few policy documents. **The NNP II and the NCD Action Plan called for regulatory approaches to address unhealthy lifestyles and diets** (replacing trans-fats and saturated fats, reducing salt and sugar), through production and marketing of healthy foods while minimizing the effect of unhealthy marketing, front-of package labeling of sugar and salt and taxation of sugar-sweetened beverages. **An Excise Tax Directive in 2020 introduced higher taxes for foods high in saturated fats, sugar, and salt. The School Health Program suggested prohibiting the promotion of soft drinks, sweets, and foods (School Health Program, 2017).**

The school food environment is an important food system intervention entry point for any country. Most education policy objectives addressed student retention in schools, the quality of education, nutrition education, and the overall school environment. The school setting has been recognized as a good platform for awareness raising and sharing nutrition information. **Policy instruments in schools focused on life-skills training, using SBCC approaches on hygiene and sanitation, dietary behavior change, and food safety.** Policy instruments regulating or guiding the availability of foods and drinks on school premises are only in place for school feeding programmes. (School health and nutrition strategy, School Health Program 2017, Seqota and NNPII).

Despite the multiple policy efforts described above, challenges have been experienced that point to what may be needed to accelerate progress on food system transformation. These challenges include

the need to increase production diversification for agriculture to supply a more nutrient dense food basket, enhancing NSA capacity and limited resources for the magnitude of intervention required across sectors and different agro-ecological settings in the country. In addition, there has been limited attention to creating synergy across different efforts. There is, therefore, a need for prioritization of actions that are catalytic in nature. It is important to identify what such catalytic actions would be, **and these would be the “game changing actions”** if they affect important elements of food system transformation according to challenges alluded to in this background paper.

In response to the challenge on limited resources the Ethiopian government has responded with a historical budget allocation to nutrition of 16 million and 15.5 million USD for E.C 2012 (2019/20) and E.C 2013 (2020/21) respectively, for Seqota Declaration Innovation Phase woredas where the lion share goes to NSA interventions.

6. Interventions needed to transform food systems to provide more sustainable healthy diets

Agriculture and the market systems are important components to ensure individuals and households are food and nutrition secure and that healthy diets are accessible to all. **Raising agricultural productivity and prevention of postharvest loss remain powerful forces for reducing food and nutrition insecurity.** As indicated in Section 3 higher productivity levels can also help lower GHG emissions in the Ethiopian context. Higher production and productivity of nutrient dense foods on one’s own farm or from one’s own herds enhances household food and nutrition security particularly where there is limited access to markets. However, poverty constrains the ability of farming or pastoralist households to invest in productive assets and agricultural technologies. Fragmentation of land due to population pressure in rural areas, and the low prices farmers are paid for produce, mean that in many rural areas the farms are already too small to provide greater food security or a living income for the household in sub-Saharan Africa (Giller, 2020). The situation is similar in Ethiopia and the only way much improvement in food security and nutrition can take place will be by increasing productivity on the available land. The conundrum that must be addressed is how to provide inexpensive, nutritious food to feed the growing urban and rural populations while creating incentives to stimulate increased agricultural production of nutritious foods (Giller, 2020). In Ethiopia, high levels of postharvest loss of food in both quality and quantity, and insufficient value addition hampers food availability and marketing. Poor market links result in high costs of inputs and low prices for farm produce, providing poor economic incentives for farmers to invest in yield-enhancing sustainable agricultural production systems. **For both rural and urban settings, stable market access to food requires that food market value chains are efficient in supplying food that is safe and affordable, while also providing benefits to farmers and others along the food supply chain who have food to sell.** Yet, efforts in the agriculture sector, if conducted in isolation from needed activities in other sectors such as market and industry, health, and education, will not bring food and nutrition security to the majority.

Given the above challenges, considerable investment is needed in the development, dissemination, and promotion of uptake of technologies that promote regenerative farming practices to increase yields and

reduce losses and indeed even GHG emissions. Similarly, investments should be made to support development and uptake of technologies that enhance food safety and shelf-life of products, helping distribution of perishable and highly nutritious products to urban areas, where often higher market prices can be obtained.

Despite over four decades of organized agricultural research and development in Ethiopia, there is no significant shift in the portfolio of crop technologies developed, improved varieties or certified seed release. **On varietal release, where cereals predominate, wheat and maize occupy the major share of all crops (Bishaw and Atilaw, 2016).** As an illustration, in 2014, wheat and maize occupied 64 and 19% of formal seed supply, respectively, yet the crops occupied only about 13 and 17% of cultivated area, respectively (Bishaw and Atilaw, 2016). The current situation on varietal development is that: 1) grain yield, climate and pest stress tolerance have been overriding criteria for breeders and farmers, while grain quality traits for nutrition including biofortification have not been addressed for these major crops; 2) there is limited or lack of legume seed supply which are main contributors for nutritional security and environmental health (soil fertility and soil health) leading to cereal mono-cropping in the highlands; 3) there is limited or non-existent domestic vegetable seed supply and heavy reliance on imports narrowing production and diet diversity.

Ethiopia has one of the lowest animal source food consumption levels in Africa despite the very high number of livestock. Consumption is affected in part by cultural and religious practices but also because livestock is an important “economic” asset associated with resilience. The country derives much economic revenue from live meat animal exports to the Middle East and livestock production is therefore an important economic livelihood for the country. Livestock productivity for meat, dairy or eggs are very low therefore maintaining high costs of production per unit of produce affect prices and affordability while limiting revenue potential. The contribution of such low productivity levels to GHG emissions is also important and has been addressed in Section 3. **It has been indicated that limited attention has been given to productivity and development of market value chains for livestock and related products.** The role that livestock can play in regenerative agriculture needs to be explored given the large numbers of livestock Ethiopia has. In pastoralist communities, livestock are often the predominant livelihood and source of nutrition sustenance as the only readily available source of highly nutritious products, such as milk.

Food environments have an enormous influence on diets, as seen by their effective influence on triggering drastic dietary changes towards excessive consumption of packaged ultra-processed foods, beverages, and snacks in LMICs in the past decades (Popkin et al, 2020). This is also being experienced in Ethiopia especially in urban settings. The influence of food environments should be leveraged to reverse trends towards healthier food procurement systems that are profitable, yet supportive to improved consumption patterns for better nutrition and health. Examples of high-potential interventions to achieve these goals are both mandatory and voluntary food labelling adapted to ensure consumer comprehension and use (Mandel et al, 2015).

Regulations against advertising and marketing of unhealthy food products, especially to children should be considered as part of promoting better consumer choices by preventing unethical enticement of children and others towards unhealthy consumption patterns (WHO, 2006).

Information dissemination, behavioral nudges, and enhancing the food environment to make the choice of sustainable, healthy foods the easier choice for consumer are also important. This includes guidelines related to the physical food environment such as strategic positioning and presentation of healthy versus risk foods (Anzman-Frasca et al, 2015) and a combination of taxes or subsidies to discourage risk foods while encouraging healthier choices (Hawkes et al, 2020; Redondo et al, 2018; Shekar et al, 2020) must form part of a positive food system transformation for Ethiopia. Experience with testing of these approaches is mounting in Low and Middle Income Countries (LMICs) but research is needed to document successes, failures, impacts, potential for scale-up and adaptation to the Ethiopian context.

Consumer behavior change is another area of useful intervention as part of food system transformation. There is ample literature on the use of consumer behavior change interventions, including public awareness campaigns, digital interventions, and social media (Young et al, 2019) m-nutrition services (Muller et al., 2016), and social marketing by the private sector (Abril et al, 2019) and on experimental use of social norms to influence healthy eating (Robinson et al, 2014). However, most examples are from LMICs. Food choices and utilization can be improved through dissemination of recipes, chef's recommendations, and cooking classes and training. However, evidence on the impact of these strategies in influencing healthy diet choices in LMICs is extremely scarce (Webb-Girard et al., 2020). Large scale demand creation and behavior change communication strategies targeting children, adolescents and adults need to be paired with innovation in all components of the food system to maximize impacts on promoting sustainable healthy diets.

As part of promoting food system transformation, targeted social protection programs, including cash and food transfers can play an important role in promoting sustainable and healthy consumption patterns among vulnerable population components and under emergency situations. Different strategies of social protection have already been used in Ethiopia within the Productive Safety Net Programme. In the current global COVID-19 pandemic, social protection strategies have been used extensively to respond to the immediate needs of populations affected. The programs could be strengthened to support healthy diets more directly by including information, behavior change communication, and promotion of nutritious foods; providing direct incentives such as vouchers for nutritious foods; offering healthy school meals (with or without a community/school garden component) or healthy meals in office canteens and food procurement systems. It is important that such programmes be done with a food system lens to use them as levers to catalyze broader food system transformation objectives.

The 5Ps centered approach taken for this background paper can facilitate a more holistic view on the needed transformations in relation to crop and animal production, food & consumer environments, and social protection. Contribution to sustainable healthy diets regardless of the intervention domain of the food system can be used as a common goal to generate alignment and synergy.

7. Public private partnership in Ethiopia’s food system transformation

We know that the private sector provides most products and services to meet most of population food and dietary needs. The International Finance Corporation (IFC) estimates that the 4.5 billion people at the “base of the economic pyramid” spend \$2.3 trillion a year on food and beverages. Including business in the national nutrition program and plans, acknowledges how people live and offers the potential to impact nutrition more sustainably and at greater scale.

In its capacity as a supplier, distributor and marketer of food, private enterprise, whether multi-nationals, national companies, Small and Medium scale Enterprises (SMEs) or indeed street vendors, can be the source and inspiration of innovations of new products and technologies, new financing mechanisms and new distribution models that are needed. As an employer and as part of the fabric of communities, business can also have a significant and an important impact on achieving local nutrition goals with sustainability considerations.

The public sector is an important actor with responsibility for setting the policy and regulatory environment within which the private sector can respond with targeted provision of nutritious foods, supplements, and services that can contribute positively to improved nutrition and health outcomes for the population as a whole. The business sector is important in ensuring a continuum of access to good quality food products and services that can target consumers under different settings including those needed under emergency settings.

In Ethiopia, more businesses are recognizing that food and nutrition security is intrinsically linked to business growth, performance, and sustainability. Identifying ways to align the core commercial priorities and investments of a wide spectrum of businesses across many different sectors with national food and nutrition security goals is increasingly important for Ethiopia. **Game changing actions will be those that provide alignment of business objectives to national objectives on improving consumption patterns for better nutrition and health while limiting negative impacts on the environment.**

From a business perspective, the motivation for engaging with food and nutrition can be summarized around four drivers that should underpin business objectives with a positive food system perspective (Table 7.1). These provide entry points for public sector interventions to ensure compliance and that business can contribute positively to a food system transformation that is supportive of better nutrition and health, sustainably.

Table 7.1. The four drivers that underpin business objectives for a positive food system perspective.

Driver	Private sector response to transform the Food System	Opportunities to transform the food system
Opportunities to increase sales & profits.	Developing new dynamic markets through product, service, and business model innovations, lowering costs, and increasing the availability of nutritious foods and supplements.	Government and development partners increase public and consumer awareness and demand for good food and nutrition.
Strengthen their reputation and “license to operate”.	Develop corporate social responsibility policies and strategies in line with national nutrition program objectives.	Access to food and nutrition security is both a moral obligation and a fundamental human right.
Improve their productivity.	Businesses investing in workplace appropriate nutrition programmes to see their investments repaid in a reduction of sick-days and accidents, and an increase in productivity.	Good nutrition is an essential foundation of a productive workforce and sustainable supply chain. Undernutrition undermines business productivity amongst the direct workforce and along the supply chain and impacts occupational health and safety performance
Businesses rely on healthy communities for sustainable supply chains.	Businesses contribution to the health and well-being of the communities within which they operate being relevant to business performance.	An estimated 11% of GDP in Africa is lost to undernutrition every year, with productivity losses to individuals estimated at more than 10% of lifetime earnings. Businesses are embedded in these communities and should be interested in addressing such losses.

Business comparative advantage in nutrition is grounded in its commercial core business operations and value chains, which offer the potential for its contribution to be financially self-sustaining and scalable. As such, business offers different capabilities than the public sector. These value chains are also important for economic development and the livelihoods of many. Business activity can be leveraged to contribute along the following key areas of the food system.

- **Scale:** The processes and systems underpinning business operations enable business contribution to be delivered efficiently, cost effectively and at scale. This can be leveraged to deliver nutrition food and lower cost and more affordably.
- **Product and service innovation:** Businesses have the capabilities and resources to develop product and service innovations that can make nutritious food more available, affordable, and desirable to

consumers. If diet quality and sustainability are used to inform innovation, business actions could be leveraged to contribute more positively to food system transformation than has been the case.

- **Quality management and food safety systems:** Businesses can embed quality management and safety systems along the food value chain, particularly in food storage facilities and packaging.
- **Demand creation for nutritious products:** Along the food value chain, businesses are uniquely positioned to create demand for nutritious foods - by harnessing supply chains to procure nutritious crops from farmers, by incentivizing distributors and retailers to sell nutritious foods, and by using their consumer insights, brands, marketing resources, expertise, and channels to build understanding of nutrition and change behaviors amongst consumers.
- The diet quality centered approach taken for this background paper must form a lens through which business contributes to food system transformation so that business actions are leveraged to foster transition to healthier sustainable diets within the Ethiopian context.

With the above considerations, business can thus contribute to better nutrition and health outcomes in Ethiopia in the following ways:

- a. **Agriculture and nutrition:** At each stage of the food value chain, businesses can provide investment in technological innovation, and commercial capabilities to increase the supply of nutritious, safe, and diverse foods. It is important to recognize small holder farmers as entrepreneurs interested in profitable livelihoods. Game changing ideas should consider this perspective. Developing reformulated food products using nutrient enriched foods including biofortified food for example is one way of delivering affordable, more nutritious diets.
- b. **Large scale food fortification:** To address widespread micronutrient deficiencies, food businesses can fortify staples and condiments with essential vitamins and minerals to reach large proportions of the population cost-effectively and at scale. Standards for iodized salt, fortification of wheat flour and edible oil have been developed and approved in Ethiopia. However, only the Salt Iodization standards are mandatory. The standards for wheat flour and edible oil have been approved as voluntary. Mandatory fortification is required to ensure adequate coverage. But investments must also include supporting monitoring micronutrient status through regular government surveys so that adjustments to fortification standards can be done timeously as micronutrient intake patterns change over time.
- c. **Innovation and local solutions:** Market based approaches can increase the availability of specially formulated foods, with a particular focus on pregnant and lactating women and complementary feeding of infants, complementing public delivery systems especially under emergency settings. But care is needed to ensure protection of appropriate infant feeding practices. Exclusive breastfeeding in the first six months of life and continued breastfeeding thereafter according to WHO guidelines should not be compromised.
- d. **Workplace:** Businesses across all sectors can engage in promoting education of their employees on the importance of nutrition and provide diverse and nutritious foods in the workplace with sustainability consideration. Businesses can also introduce workplace policies that facilitate access to breastfeeding facilities, childcare and maternity benefits.

- e. **Supporting nutrition sensitive interventions:** Businesses can play a key role in strengthening underlying health systems, for example providing health and hygiene products and health services, supporting women economic empowerment and access to education.

As part of food system transformation businesses are uniquely positioned along the food value chain, the workplace and within communities, not only to increase the supply of nutritious foods but also to increase demand. The contributions that business could make can be enhanced and scaled up through greater collaboration with governments, development agencies and civil society. As for other food system transformation those within the business sector can be informed and be monitored through the diet centered approach taken in this background paper to foster synergy with other efforts. Such an approach can be a valuable game changer on business contribution to sustainable food system transformation in Ethiopia.

The SUN Business Network Ethiopia (SBN-Ethiopia) has been set up to enhance and strengthen the private sector's contributions towards improving nutrition in Ethiopia. SBN-Ethiopia will champion and mobilize business behind the Food & Nutrition Policy and National Nutrition Plan II (2016-2021) and support the Federal Government of Ethiopia to realize the National Nutrition Program and to provide a strong enabling environment for positive business engagement in nutrition, to ensure that all people have access to safe, affordable, and nutritious food in Ethiopia.

SBN-Ethiopia creates an enabling environment to commit and align business behind national nutrition strategies with the following objectives:

1. Mobilizing business in Ethiopia to contribute to reducing malnutrition in all forms.
2. Making nutrition more aspirational, accessible, affordable, and available to consumers in Ethiopia.
3. Building the case for greater business engagement in nutrition amongst all stakeholders in Ethiopia.

The game changer will be finding ways of incentivizing positive business behavior that promotes food system transformation supportive of healthy sustainable consumption patterns.

8. Lessons from the COVID-19 Pandemic

The COVID-19 pandemic and the disruptions that it has had on the food systems and agricultural value chains has amplified the need to address all the challenges that have been identified above. The lessons learned call for greater attention to market value chains to ensure continued food supply under such emergencies and targeted communication challenges to reach the public with appropriate messaging. Because of the pandemic experience there is greater urgency to implement the Digital Ethiopia 2025 Strategy to promote value chains that are more resilient to emergency shocks such as has been experienced under the ongoing COVID-19 pandemic. The following action areas of the Ministry of Agriculture's COVID Response plan are aligned with the challenges that have been alluded to elsewhere above and seeks to; 1) provide agricultural and business services for communities that includes

attention to digital approaches on extension; 2) facilitate safe and timely distribution of inputs especially fertilizers; 3) increase production of vegetables and grains especially wheat that is more import dependent, including off season production using irrigation; 4) facilitate domestic and export agricultural commodity supply chains by improving market linkages, and 5) help vulnerable part of the population with food support through social protection mechanisms.

The above information reflects strong alignment with the challenges that have been identified elsewhere above and point to key areas where game changing ideas can make a difference on food system transformation.

9. Policy considerations to accelerate food system transformation in Ethiopia

A right mix of policy instruments is needed to address all forms of malnutrition across the whole food system more broadly. Interventions on the individual level to improve knowledge and practices need to be strengthened. Policy instruments must be aligned to limit or avoid potential negative trade-offs and there must be coherence of implementation for synergy across sectors and stakeholders. This would be game changing. As referred to elsewhere above the required diet quality can be a unifying factor for coherence. Business actions (both formal and informal), schools and tertiary institutions, and other institutions (hospitals, prisons etc.) should provide opportunities to promote healthy options while avoiding unhealthy options. When policies and strategies are revised, and implementation plans are made elements that foster the desired alignment for sustainable food system transformation should be included. Such considerations consider the following elements,

- **Better diet quality perspectives should be integrated within long-term visions and outcome areas** for implementation of relevant policies and strategies.
- As indicated elsewhere, **diet quality perspectives can be included in monitoring and evaluation plans** according to how diets relate to the specific policy or strategy being implemented. Appropriate indicators for this need to be developed and can be useful game changers.
- **Agricultural development programmes should be required to demonstrate how they are contributing to diversification** to a nutrient dense food basket and the related sustainability considerations and the needed attention on staple foods, legumes, and animal source foods to improve productivity, food safety, and nutrition traits. Such a focus should include aligning and increasing investments in research and development in favor of nutrient-rich foods.
- **Attention is needed to provide an enabling policy environment for development of market value-chains for nutrient dense foods like fruits, vegetables, and animal source foods.** This should include cold value-chains and related infrastructure to reduce post-harvest losses.
- **Using the lessons learnt from nutrition-sensitive programmes to maintain political will for nutrition-sensitive approaches.**
- **In monitoring progress on food system transformation attention is needed to the accompanying impact on the environment and on long term sustainability.** These elements must be included in monitoring plans of policies and their related implementation plans.

- **Research by postgraduate programmes at Ethiopian universities should be supported and structured to provide solutions to implementation challenges and the needed innovations** under different agro-ecological settings.
- **Gender issues need more long-term action** targeting deeply rooted social norms throughout the food system.
- **Coordination efforts must address coherence across stakeholder efforts and the needed synergy.**
- **Social protection policies should be refocused to support sustainable, healthy diets more directly.**

On policy considerations, as with earlier sections of this background paper, taking a diet quality centered approach would be game changing by unifying policy instruments around a common goal of fostering sustainable food system transformation from different domains of the food system.

10. Game changing actions on the UNFSS Action Tracks: What are the issues?

This section suggests questions that should be addressed by the UNFSS Action tracks. It provides a list of questions under each action track for which game changing actions are needed. These questions are intended to inform the planned UNFSS Dialogues that will be conducted to inform the EFSS and the UNFSS. Table 10.1 presents the theme of each of the five action tracks and the related challenges that need to be addressed to inform “game changing actions” for Ethiopia.

Table 10.1 UNFSS Action Tracks and related questions to inform game changing actions for Ethiopia.

UNFSS Action Track	Related challenges
Action Track 1: Ensure access to safe and nutritious food for all:	<ul style="list-style-type: none"> - How can we strengthen food safety and extend products shelf-life across the food value chains for nutrient dense foods like, milk, meat, eggs and perishable but highly nutritious vegetables? - How can we mainstream positive WASH habits widely in all sectors of the population?
Action Track 2: Shift to sustainable consumption patterns	<ul style="list-style-type: none"> - How can we make nutrient dense foods more available, accessible, and affordable to the majority of the population? - What is the best way to promote a viable seed/seedling sector for legumes, vegetables, and fruits? - How can we promote increased consumption of nutrient dense foods like animal source food among those that need them while at the same time encouraging moderated consumption for sectors of the population that are already overconsuming? - How can we ensure that the business sector considers

	product quality through nutrition, health and sustainability lenses and not profit only?
Action Track 3: Boost nature-positive production	<ul style="list-style-type: none"> - What regenerative food production practices can be adopted in different agro-ecological contexts in Ethiopia to foster sustainable healthy diets? - Low productivity contributes to the GHG emission challenge from the agriculture sector. What are the right production practices to increase productivity without creating negative environmental impacts under different agroecological settings? - How can food losses be reduced as a path to sustainability in agriculture and to improve food availability and affordability? - How can we make input supply efficient and accessible to farmers big and small?
Action Track 4: Advance equitable livelihoods	<ul style="list-style-type: none"> - The needed food system transformation must include creation of equitable livelihoods where farmers are equitably compensated. - Food systems that foster gender equity along all the steps of the chain. - What types of livelihoods can be created to support the needed food system transformation? - How can Ethiopian academic institutions incorporate the needed livelihoods in their academic programmes to support viable economic activity associated with these livelihoods?
Action Track 5: Build resilience to vulnerabilities, shocks, and stress	<ul style="list-style-type: none"> - Ethiopia faces frequent weather shocks that present food insecurity challenges. How can resilience be enhanced under different agro-ecological zones and at national level? - What type of early warning systems are needed?

11. What do we need from researchers to accelerate food system transformation in Ethiopia?

Research must be considered as a key component of promoting sustainable food system transformation. In the previous section, Table 10.1 alludes to areas where there are gaps for which game changing solutions are needed. In this section we present gaps according to drivers of food system transformation. Table 11.1 presents this information.

Table 11.1 Important research gaps to support food system transformation in Ethiopia

Driver of food system transformation	Research gaps
Diet quality and food safety	<ul style="list-style-type: none"> - Dietary data under different agro-ecological settings is lacking. It will be important to have a National Food Consumption Surveys that are representative at the agroecological level. Such consumption surveys need to be done regularly. - Subsequent consumption surveys can be used to monitor the impact of food system transformation actions over time. - The Capacity of National Universities to contribute to generating the needed dietary data should be enhanced. - Dietary data at the agroecological zone level will be useful to inform agricultural interventions on the supply side. How best can dietary gaps and excesses be determined across different agroecological settings to ensure contextualization. - How can food safety be improved systematically across the food system from production to consumption?
Food environments and consumer choices	<ul style="list-style-type: none"> - Factors influencing food choices under different cultural settings and agroecological zones must be better understood. - How are the food and consumer environments, including advertising, currently impacting consumption choices need to be better understood so that mitigating efforts can be developed to inform regulatory instruments and behavior change communication? - There is a need to build evidence of food environment approaches and document successes, failures, impacts and potential for scale-up. - How can food environment interventions be designed from consumer demand perspective? - How can consumer behavior change interventions be best packaged with interventions in other components of the food system to maximize impact? - What mechanisms can be used to monitor potential business impacts on food system transformation, both positive and negative to direct progress?
Production	<ul style="list-style-type: none"> - Production diversity is limited in Ethiopia. How can production and appropriate consumption of nutrient dense foods, such as fruits, vegetables

	<p>biofortified crops and animal products be best promoted?</p> <ul style="list-style-type: none"> - The input supply sector is of particular challenge. How can a viable seed sector be promoted? What would be most catalytic?
Transport and storage	<ul style="list-style-type: none"> - What types of developments are needed to support catalytic developments in the transport and storage component of the food system under different agro-ecological settings?
Post-harvest and small-scale food processing	<ul style="list-style-type: none"> - Post-harvest losses are a challenge. What mechanisms can be used to reduce post-harvest losses across the agricultural value chain? - What food processing technologies would be helpful in reducing post-harvest losses, extending shelf life, and improving availability and accessibility of nutritious foods under different settings?
Retailing and provisioning	<ul style="list-style-type: none"> - The retail sector both formal and informal, are important components of the food system. - How can provisioning of nutrient dense foods be promoted? - What mechanisms can best promote food safety systemically for retailing and provisioning? - What type of market information, advertising guidelines & labelling would be most effective to change consumer behavior in such a way as to increase demand for sustainable healthy diets under different settings? - What types of incentives would be helpful to encourage moderation of the consumption of (ultra)processed foods under different settings?
Governance	<ul style="list-style-type: none"> - How can FBDGs be used to inform policies and strategies for food system reform and how can impact be monitored? - What would be appropriate strategies for improving the affordability of healthier diets? - On social protection, what combinations of strategies are most effective under different settings
Cross-cutting	<ul style="list-style-type: none"> - How can food system interventions be packaged to accelerate food system reforms and impact on food system transformation toward healthy and sustainable diets?

12. Conclusion

The available evidence in Ethiopia reflects that there are challenges across the entire food system from production to consumption and that environmental sustainability is equally challenged. Production is challenged by limited production diversity and access to appropriate inputs including fertilizers and seeds. Prices of nutrient dense foods have increased significantly over time making healthier diets unaffordable and difficult to access for the majority. Both productivity and production diversity must increase with regenerative agricultural practices that rehabilitate and improve soil quality while preventing land degradation and deforestation. This will contribute to reducing GHG emissions that result from low productivity levels. But care is needed that so that extremes are avoided.

Post-harvest losses are high. Innovative approaches that address the losses would be desirable game changers. Although food processing activities are still relatively limited, the footprint of ultra-processed high energy-dense low nutrient dense foods is increasing leading to increasing overweight and obesity at a time when undernutrition is still highly prevalent. Regulatory measures are needed to promote healthy product development and limit health risks associated with consumption of high energy low nutrient dense foods.

Food safety challenges limit the nutrition and health benefits that could potentially be accrued from nutrient dense food when available. The food safety challenges include multiple hazards and microbial contamination and present significant foodborne burden of disease. Implementation of food safety mechanisms systematically across the food system from production to consumption are needed and this calls for aligning and strengthening of national food safety systems.

Environmental sustainability is also a challenge with soils that are largely depleted and with highly prevalent deforestation especially in mountainous and drought prone areas where the loss of topsoil is heightened. Pesticide and fertilizer use are increasing while related safety awareness and mechanisms to avoid water and land pollution are still limited.

The multiple challenges faced culminate in consumption patterns that reflect very poor diet quality characterized by small proportions of the population meeting their minimum diet diversity across different agro-ecological and religious settings. The challenges faced call for food system transformation in Ethiopia that takes a holistic approach from production to fork and to address the associated environmental risks relevant to the country context. The entire food system must transform using a sustainable and healthy diet-centered lens that minimizes tradeoffs. This calls for strong alignment across different food system actors using sustainable healthy diets as a common goal that fosters the alignment.

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Annex 1 Contributor's names and affiliated institutions

This background paper was developed through contributions from government and development partner researchers and programme implementers engaged in work in different components of the Ethiopian food system. We are grateful to them and their affiliated institutions, their dedication and time to contribute information based on available evidence on food systems in Ethiopia. In alphabetical order based on surname, the contributors are, Silvia Alonso, Solomon Aderu, Kaleab Baye, Tesfaye Hailu Bekele, Zewdie Bishaw, Inge D. Brouwer, Lynn R Brown, Namukolo Covic, Filippo Dibari, Tewodros Girma, Delia Grace, Ton Haverkort, Alemtsehay Sergawi, Sisay Sinamo, Mulugeta Teamir, Fesseha Tekele, Ursula Trübswasser. Details on affiliation of the contributors are given in the table below. The background paper development process was coordinated by Dr Namukolo Covic.

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