



HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

HLPF 2020 Session: Ending hunger and achieving food security for all Background Note

1. Executive summary

1. Food security, good nutrition and sustainable agriculture are central to the 2030 Agenda and they lay the foundation for achieving all SDGs.
2. Progress has been made with regard to food security, nutrition and agricultural productivity over the last two decades.
3. However, progress has been uneven and hunger reduction has reversed in recent years, with the world's food systems leaving hundreds of millions of people behind. Hunger, undernutrition, the rapid increase in overweight and obesity are key challenges to be tackled.
4. Unsustainable practices throughout the food systems (agriculture, food supply chains and system governance) cause environmental degradation and high greenhouse gas emissions, with enormous social and economic implications, especially for the most vulnerable and marginalized. Unsustainable practices within food systems can and have contributed to the genesis and propagation of disease and pandemics.
5. The current COVID-19 pandemic has added to and amplified existing challenges, especially affecting countries in special situations and vulnerable groups. At the same time, it could be used to strengthen momentum towards “building back better” and moving towards sustainable and inclusive food systems and nutrition patterns.
6. Business as usual, including upscaling unsustainable current practices, is not an option and food systems need to be re-thought in a radical manner. Delaying action is also not an option as the human, economic and environmental costs are predicted to balloon.
7. Urgent actions are needed taking into account the interlinkages between SDG2 and other SDGs so as to mitigate trade-offs and maximize synergies.
8. Transformation of the food systems needs to address the root causes of hunger, food insecurity, inequality, unsustainable management of natural resources and the contribution of food systems to greenhouse gases in a comprehensive manner. It should include action in three inter-related domains: (1) changes in dietary habits towards healthy diets from sustainable food systems; (2) sustainable production systems and food value chains and management of natural resources; and (3) a social agenda which considers the rights, needs and capacities of the most vulnerable and marginalized and includes investing in family farmers, small-scale and indigenous food producers and finding solutions to increase their incomes and improve their livelihoods.
9. Key elements required for a transition to sustainable food systems include: enabling public policies; inclusive governance mechanisms, including empowering and strengthening the capacities of family farmers and other small-scale producers, Indigenous Peoples, women, youth and other vulnerable groups in the decision-making process; responsible investments and innovative finance; incentives for and broad access to innovation and sustainable technologies; adaptable business models; reducing inequalities; behavioral changes; public-private and international collaboration.

2. Stocktaking and challenges

a) Overview of Progress and Challenges in achieving SDG2

Progress made against hunger and malnutrition

The 2030 Agenda for Sustainable Development aims to “end hunger, achieve food security and improved nutrition and promote sustainable agriculture”. In the last decades, increases in population, demographic changes, urbanization, globalization, migration, and rapid technological innovation are some of the key drivers of food systems change. Overall economic growth has been impressive: global GDP per capita has increased from US\$3747 (constant 2010 US\$) in 1960 to US\$ 10894 in 2018ⁱ, albeit with wide variation among different regions and countries.

Growth in agricultural productivity especially for staple crops has been impressive and has spurred rural and overall development and poverty reduction. World cereal yields have increased from 1.35 tons per hectare to 4.07 tons between 1961 and 2018. In the world as a whole, less than one third of the arable land area was necessary to produce the same quantity of crops in 2014 relative to 1961ⁱⁱ. Agricultural prices have fallen over the past thirty years, and in most countries, the proportion of household income spent on food has also fallen.

Over the last 30 years, consumption of all food products, including cereals, meat, milk and eggs, in low-and middle-income countries (LMICs) has more than tripled.ⁱⁱⁱ Undernourishment has been reduced globally, both in its prevalence (from 18.6 percent in 1990-92 to 10.7 percent in 2016-18) and in absolute numbers (from over 1 billion people to 821 million in the same period).^{iv} Likewise, child malnutrition rates have improved. Stunting rates for children under 5 years of age fell from 23.1 percent in 2015 to 21.3 percent in 2019. Better nutrition has resulted in improved health and a higher life expectancy, including through increased resistance to diseases, such as malaria and schistosomiasis, which are widespread in tropical contexts.

Remaining gaps and challenges in food and nutrition

Progress made, however, has been insufficient to meet global goals while progress is unbalanced and, in some cases, reversed. Economic growth has been uneven and the benefits skewed towards wealthy groups. Income and wealth inequality and inequality in access to income and other resources and services, has widened among and within countries over the past few decades, hampering food security and nutrition progress especially amongst the most vulnerable. Increasing intensification of production has resulted in extensive, and often irrational, use of fertilizers, agrochemicals and antibiotics with negative health consequences. Globalization and trade liberalization have privileged long food-supply chains spanning across national borders, while modern distribution and retail systems are penetrating food markets even in remote areas of the planet. The expansion of such models of production and distribution have resulted in important gains in efficiency and lower food costs but have also caused the marginalization of smaller “players” in the agri-food markets, erosion of traditional livelihoods of rural communities and Indigenous Peoples and have undermined the ecological and material conditions of their survival.

After a long-term decline, hunger has actually been increasing since 2015 due *inter alia* to income inequality, economic slowdowns, conflict, and extreme weather events, including those related to climate change. As many as 821 million people were still hungry in 2018^v. Globally, about 2 billion people are considered moderately or severely hungry according to the Food Insecurity

Experience Scale (FIES) (SDG indicator 2.1.2). Two billion people suffer from ‘hidden hunger’ or micronutrient deficiencies while progress in the reduction of stunting has slowed. Worldwide, 144 million children under 5 years were still affected by stunting in 2019 with three quarters of these children living in Central and Southern Asia or Sub-Saharan Africa.^{vi} In 2019, wasting affected 47 million children under 5 (6.9 percent)- with over half of the wasted children living in Central and Southern-Asia.^{vii} Even in high-income countries, sizeable portions of the population lack regular access to nutritious and sufficient food: eight percent of the population in North America and Europe is estimated to be food insecure. For some lower income households, food expenditures may exceed 50% of their income making them vulnerable to price volatility. COVID-19 is going to exacerbate the extent of the challenges.

Global trends in hunger mask substantial differences in performance among regions, sub-regions, countries and socioeconomic groups within countries. Hunger is rising in almost all subregions of Africa and, to a lesser extent, in Latin America and Western Asia. In every continent, the food insecurity prevalence rate (FIES indicator) is higher, albeit slightly, among women than men and higher in rural than in urban areas.

Reducing hunger and undernutrition (wasting, stunting, underweight) while a rapid increase in overweight and obesity occurs worldwide, portrays the continued emergence of the double burden of malnutrition. In 2016, approximately 2 billion adults were overweight representing two out of five adults globally, while the number of adults who were obese increased from 564 million to 672 million in only 4 years (2012 to 2016). Globally, childhood overweight affected 38 million, or 5.6% of children under 5 years of age in 2019.

Diet-related non-communicable diseases (NCDs) have become an important nutrition and health concern, in both low- and high- income countries. Unhealthy diets and malnutrition are among the top ten risk factors contributing to the global burden of disease (heart diseases, stroke, hypertension, type 2 diabetes, and some forms of cancer). The proportion of women of reproductive age suffering from anemia will negatively affect the new generation.^{viii} Lack of access to proper nutrition among girls, pregnant women and infants has long lasting and intergenerational consequences.^{ix} Beyond the immense human costs of malnutrition, the economic costs are staggering. It is projected that undernutrition will reduce GDP by up to 11 percent in Africa and Asia, while obesity costs USD 2 trillion annually (or 2.5% of world nominal GDP in 2017), largely due to lost economic productivity and higher healthcare costs^x.

Recent decades have seen increased use of agricultural production (and associated land use) towards animal feed, timber and biofuels. These shifts, which have taken place as a result of increased demand and policy-related economic incentives, may have important implications for food security, resource use and resource degradation and the environment.

Increasing food losses and waste compromise the efficiency in the food systems, the achievement of food security and nutrition and environmental sustainability^{xi}.

Serious implications for the environment and sustainability of the resource base

The impressive gains in agricultural productivity have often come at the cost of natural resource degradation. Over 30 percent of total global land is degraded^{xii} and 33 percent of soils are moderately to highly degraded due to erosion, nutrient depletion, acidification, salinization, compaction, and chemical pollution.^{xiii} At least 20 percent of the world’s aquifers are overexploited^{xiv}, and water stocks are being salinized in many dry areas and polluted with

effluents from agriculture and other sources. Since 1990, some 420 million hectares of forest have been lost through conversion to other land uses, although the rate of deforestation has decreased over the past three decades^{xv}. The fraction of fish stocks fished at biologically unsustainable levels increased from 10 percent in 1974 to 33.1 percent in 2015.^{xvi} Agrobiodiversity is under threat globally, with only 30 crops providing 95 percent of human food and energy needs, and just five of them (rice, wheat, maize, millet and sorghum) responding to about 60 percent of the needs.^{xvii} Reduction of biodiversity in food and agriculture leaves farmers with fewer options to deal with crop failure, pests and diseases, declining soil fertility and increasingly variable weather.^{xviii}

Agriculture, forestry and other land use (AFOLU) currently generate about 23 percent of anthropogenic global GHG emissions over 2007-2016 according to the 2019 IPCC report. Needless to say, different agricultural and food systems practices are associated with different environmental footprint: climate-smart agriculture, precision agriculture and agroecology, among others, have different implications for emissions as well as different social, economic, environmental, health and ecological impacts. At the same time, climate change affects agriculture: some crop yields (e.g., maize and wheat) have fallen in lower-latitude regions while higher atmospheric CO₂ levels lower the protein and micronutrient content of grains and legumes. The impacts of climate change and disasters are severe in many low- and middle-income countries where many people depend on agriculture for their livelihoods and where food security and adaptive capacity are low.^{xix} This is particularly notable in countries suffering from extreme freshwater scarcity, high population growth, urbanization, and conflicts, like many Arab countries. Due to resource degradation over 1.3 billion people are trapped in degrading agricultural lands with limited options for alternative livelihoods^{xx}. Climate change also has severe impacts on traditional Indigenous Peoples livelihoods and food systems in many regions, notably but not limited to Arctic and small islands.

Challenges of expanding and more complex food supply chains

Most urban and rural consumers now depend on markets for food^{xxi}, in contrast to 30-40 years ago when a substantial share of populations relied largely on own-production. Global trade in food and agriculture is “bridging” agricultural calendars and compensates for disruptions in food and agricultural production when they happen in parts of the world. Modern supply chains have become longer, with greater centralization and coordination along the parts of the chain. They often extend beyond national borders as a result of the liberalization of agricultural trade and expanding private sector investment. Growing consolidation among the leading firms that manage these supply chains has led to heightened concentration at key nodes in agri-food system. Expanding cross-border food chains become more difficult to regulate. At the same time, a broken link (production shortfalls, export restrictions, logistic bottlenecks etc.), or simultaneous shocks in multiple geographic areas (multiple breadbasket failure)^{xxii} can severely affect the system. Expansion of the modern food supply chains and can negatively impact rural communities, Indigenous Peoples’ food systems and local/territorial markets.

b) Selected cross-cutting issues to be addressed

Inequalities compromise peoples’ potential

Wealth and income inequalities are major obstacles that compromise sustainable development, exacerbate social segmentation and prevent large parts of the population from rising out of poverty. Extreme poverty continues to be overwhelmingly rural, accounting for almost 75 percent of people living in extreme poverty although urban poverty and food insecurity is a

growing concern especially in small towns and medium-size cities^{xxiii}. Some of the underlining factors are insufficient access to assets and resources, income opportunities, technology and healthy diets as well as the vulnerability and exposure of poor and marginalised communities to shocks and stressors, such as climatic extremes and disasters, conflict, economic downturns and food price spikes. Extreme poverty and inequality and competition for dwindling natural resources can be an important driver for conflict, violence and civil strife. Indigenous peoples, ethnic minorities, and women are often most harmed by inequities in political, economic, and social structures.

Gender inequality

The achievement of the 2030 Agenda is currently seriously compromised by gender-based discrimination in terms of access to physical, financial, technological and social/political capital (e.g., decision-making, inheritance rights, land and resources, training and extension, education and appropriate technology). According to the analysis in SOFA 2010-2011, the yield gap in agriculture between men and women averages around 20–30 percent, which is attributable to differences in resource use. Agricultural outputs in developing countries would increase between 2.5 and 4 percent if the lands now cultivated by women increase to the same level as those cultivated by men. Increasing production by this amount could reduce the number of undernourished people in the world in the order of 12–17 percent^{xxiv}.

(Rural) youth

Between 2015 and 2050, the number of people between 15 and 24 years of age is expected to rise from about 1 billion to 1.2 billion in low- and middle-income countries. Most of these young people are expected to live in Sub-Saharan Africa and South Asia, primarily in rural areas. In Sub-Saharan Africa alone, more than 10 million new jobs per year will have to be created in rural areas over the next two decades, in addition to new jobs in services or manufacturing, to absorb the new entrants in the labour market.

Conflicts

The vast majority of chronically undernourished people and stunted children live in countries affected by conflict: approximately 490 million undernourished and over 120 million stunted children. In 2019, 135 million people across 55 countries and territories experienced acute food insecurity* (IPC/CH Phase 3 or above), many of these refugees and forcibly displaced persons. Additionally, in the 55 food-crisis countries covered by the Global Report on Food Crises 2020, 75 million children were stunted and 17 million suffered from wasting in 2019.^{xxv} On average, 56 percent of the population in countries affected by conflict live in rural areas, where livelihoods largely depend on agriculture and related sectors and activities^{xxvi}. Conflict compounds vulnerabilities and deprivations; causes forced population movements; and the destruction of food stocks and productive assets disruptions to food markets, leading to increased food prices and decreased household purchasing power, as well as diminished access to water and fuel for cooking.

Climate change

Climate variability and natural hazards are also one of the leading causes of severe food crises. The number of natural hazards, including extreme heat, droughts, floods and storms, has doubled since the early 1990s, with an average of 213 of these events occurring every year during the period of 1990–2016. They harm agricultural productivity contributing to shortfalls in food availability, displacement of populations, food price hikes and income losses that reduce people's

access to food.^{xxvii} As some of those extreme events are linked to climate change, agriculture is facing tremendous adaptation efforts in relation to climate change.

As mentioned previously, the AFOLU sectors are also drivers for climate change. Lack of action towards deep transformations at all stages of food supply chains and consumption means that the global community does not take advantage of the co-benefits of adaptation and mitigation efforts, including agriculture that is better adapted to new climate realities (FAO, 2016^{xxviii}) and sustainable practices (HLPE, 2019^{xxix}).

3. COVID-19 crisis: impacts and recovery

a) COVID-19 impact: Highlighting inequalities and vulnerabilities in food systems

The COVID-19 pandemic continues to wreak havoc globally with millions of people infected and affected by the disease and hundreds of thousands of deaths. Food and health systems were already facing serious challenges before the COVID-19 shock. The COVID-19 pandemic aggravates this situation and could have devastating effects on food security and nutrition, incomes and livelihoods, morbidity and mortality, especially in developing countries and countries affected by conflict. Measures taken to contain the spread of the pandemic are already disrupting economic activity and have serious negative implications for economic growth, social cohesion and poverty reduction. Some export restrictions, work stoppages and altered production plans due to illnesses among those employed in food systems, food losses and logistical constraints along the food supply chain have affected availability, economic access to and stability of food supplies. A global recession and reductions of income, including that from remittances, will further compromise purchasing power of the poor and vulnerable groups.¹ Poor nutrition due to a collapse in purchasing power and local food shortages creates further vulnerability to COVID-19.

The available analysis so far of the impact of the COVID-19 pandemic on food systems shows that effects will be stronger in the downstream segments of retail and food services. Both long and short supply chains are negatively affected due to constraints in mobility and disruptions in transport systems although the former seem to be more vulnerable. Segmented markets due to bans on food transport also creates price wedges – higher prices in consuming areas and lower prices for producing areas. These dynamics are set to affect food import dependent countries, including many countries in sub-Saharan Africa and Small Island Developing States (SIDS).

It is expected that the direct and indirect impact of COVID-19 will further undermine nutrition contributing to long-term health vulnerabilities. The World Bank projects that, as a result of COVID-19 between 71 and 100 million people will be pushed into poverty in 2020². For example, it is estimated that every percentage point drop in global GDP will result in an additional 700,000 stunted children; WFP estimates that the pandemic can push an additional 10 million of the world's children into acute malnutrition.^{xxx}

The COVID pandemic magnified existing structural gender inequalities - also as a consequence of the women's share of workforce within health, care and informal sectors - and exposed the unresolved crisis of care (uneven gender distribution of unpaid domestic and care work, gender-based violence) with significant consequences on several dimensions of food systems.

¹ Vulnerable groups include women and girls, youth, indigenous peoples, workers, refugees, migrants, displaced populations, persons with disabilities, the elderly, small farmers and food producers

² <https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty>

Many epidemics or pandemics are rooted in environmental change and ecosystem disturbances. A synthesis of literature^{xxxi} suggests that, since 1940, agricultural drivers were associated with more than 25% of all, and more than 50% of zoonotic, infectious diseases that emerged in humans, proportions that will likely increase if agriculture expands and intensifies as in the recent past. Encroachment of people and domesticated animals into natural areas can introduce a two-way process in the spreading of disease: from wildlife to humans and vice versa. The spread of diseases to wildlife can devastate wild populations and create reservoirs for the disease to be transmitted back to domesticated animals and humans.

b) COVID-19 recovery and increasing food systems' resilience to epidemics and pandemics

As the world is planning for the post-pandemic recovery, there is a crucial window of opportunity to build back better systems. Several elements of a sustainable food systems agenda are in line with the agenda for strengthening the resilience of the agri-food system (systems and individuals) to epidemics and pandemics and other shocks, including deriving lessons from the resilience of local food systems.

- A better scientific understanding is needed of pathogen spillover, the origins of disease emergence and post-spillover evolution so that human disease can be better predicted and prevented
- Agricultural systems with lower input intensity, including those based on traditional and local knowledge (including that of Indigenous Peoples) and practices, will be less susceptible to disruptions in input supply.
- Healthy and sustainable diets and good/better nutrition can be a critical determinant of resistance to infectious disease. Immune responses are energetically costly and thus undernutrition often reduces the development and effectiveness of immune responses that can limit or clear infections.^{xxxii}
- Shorter supply chains and more reliance on sustainable local food systems (multiple local sources) will minimize the risk of supply disruptions due to lockdowns and restrictions in mobility. In this context, the 'just enough', 'just in time' supply chain practices may need to be re-thought, as part of the economic stimulus packages and investments.
- Resilient supply chains need to be built that can adapt to crises, disasters and disruptions especially in light of predictions for increasing threats and emergencies in the future. More efficient systems at a local and global level that support the ability to get food where it is needed and avoid food losses and waste is critical
- The need for a more integrated (rather than compartmentalized) governance agenda became obvious during the pandemic: Better coordination between health, environment, agriculture, social protection and employment branches of government; systematic communication and coordination between human, wildlife, and veterinary health services and food safety monitoring.
- Promote "One Health" approach as an integrated approach for preventing and mitigating health threats at the Animal-Human-Plant-Environment interfaces with the objective of achieving public health, food and nutrition security, sustainable ecosystems and fair trade facilitation.

4. Policies and actions to maximize synergies, mitigate trade-offs and drive transformation

a) Taking into account interlinkages across the 2030 agenda

Food systems are more than merely production and commercialization systems and touch upon multiple dimensions and objectives, e.g. health, livelihoods, ecology, cultural heritage. SDG2 is therefore linked to and contributes to the achievement of many other SDGs of the 2030 Agenda, including SDG3, SDG15 and SDG17. Transformative changes towards more sustainable food systems and the achievement of SDG2 will support the achievement of other SDGs and vice versa: moving towards sustainable food systems will require actions aimed at other SDGs. Synergies and integration with interventions in other areas (i.e. social protection, health and nutrition and climate change) should be pursued reinforcing system-level transformations to address the root causes of food insecurity and malnutrition. Some progress has already been made to build synergies and address trade-offs through food systems.

System	Closely related SDGs selected for HLPF	Selected SDGs with synergies to harness	Selected SDGs where trade-offs need to be mitigated
Ending hunger and achieving food security for all: <i>strengthening livelihoods of the poor, ensuring sustainable and healthy food production systems and improving the lives of all</i>	2, 3, 17	1,5,8, 10, 16	6, 13, 15

b) Towards sustainable food systems -moving beyond business as usual

To feed a population of 10 billion people in 2050, FAO estimates that 50 percent more food will need to be produced than in 2013 under a “business as usual” scenario. This will still leave close to 600 million people hungry while overweight and obesity will continue to rise, and food will continue to be wasted. Under such scenario, 80% of production is expected to come from yield and crop intensity increases. However, under such scenario, arable land expands at faster annual rates than in the last decades and land degradation is only partially addressed. Land per unit of output decreases but at the expense of using progressively more chemical inputs.^{xxxiii} This will cause further deterioration of agricultural ecosystems and increase in greenhouse gas emissions. Scaling up food systems as they function today will take us further away from the SDGs and eliminate any chance of achieving the 2030 Agenda^{xxxiv}.

Postponing action is also not an option: the social, economic and environmental cost of bringing the food systems on a sustainable path will balloon as time goes by. The impacts of climate change and environmental degradation, and the costs of undernutrition, overweight and obesity on human health and productivity are clear examples.

c) Action in three inter-related domains

Food production and the system “from farm to fork” (agri-food system) needs to and can be steered towards a sustainable path. This requires a substantial shift to production, processing and distribution/commercialization models so that they can achieve more with less, promote safe and nutritious diets accessible by all, support the vital role of small-scale systems and promote climate smart processes and leave no-one behind. It should also reduce the risk of generating and propagating diseases and promote more sustainable diets. A more sustainable path for food systems will entail important interactions and positive feedback loops between SDG2 and the achievement of other SDGs and targets.

To provide sustainable solutions, enhance complementarities and address tradeoffs action must be taken in the following three inter-related domains.

1. Shifting consumption patterns towards healthier diets

Shifts in dietary habits towards healthy diets from sustainable food systems are possible but also context specific. In developed and higher middle-income countries, consumers could reduce the demand for livestock products and thus livestock's environmental footprint and at the same time improve consumer health. Changes in diets in urban areas are key as cities currently absorb up to 70% of the food supply^{xxxv,xxxvi} and are increasingly affected by the double burden of malnutrition. Therefore, shaping demand for food and transforming urban food systems towards healthier diets in line with the New Urban Agenda^{xxxvii} (SDG 11) will play an important role in what, how much and how it is produced.

Healthy diets, including the value of traditionally grown foods can be encouraged through nutrition education and communications to promote behavior change. The food environment can be shaped to ensure availability of and accessibility to safe, diverse, nutritious foods. Regulation of but also self-regulation by the private sector can be used to reduce the promotion and advertising (particularly towards children and adolescents) of ultra-processed foods, that contain high amounts of sugar, salt and fat^{xxxviii,xxxix}. The need to support healthy eating habits, based on a greater diversity of healthy foods will require joint action between public health, food and agriculture sectors. The active role of civil society, Indigenous Peoples and consumer groups in advocating for healthier diets from more sustainable systems including traditional diets, is key in this effort.

To encourage more sustainable consumption, food prices should be brought closer to reflecting the full range of costs associated with their production and consumption along the agri-food value chain (for example, costs associated with biodiversity loss, land degradation, eco-system contamination, water depletion, GHG emissions). This will limit the growth of food demand and reduce food losses and waste. However, as higher food prices may hamper the ability of low-income consumers to buy food, targeted and efficient strategies are needed to raise their purchasing power. Besides, healthy, nutritious may be more costly than one with higher levels of ultra-processed foods, which tend to be more readily available and affordable even in the poorest urban communities.^{xl}

2. Fundamental shifts towards sustainable food production systems and value chains

There is a need to change the way food is produced, processed and distributed along the value chain. Achieving sustainability will require fundamental changes in the way agriculture is practiced. Key changes are needed in land and water use and conservation, biodiversity preservation and enhancement, rehabilitation of degraded lands, limiting expansion to areas which are unsuitable for cultivation. At the same time agricultural expansion should take place in full respect of the collective land and resource rights of Indigenous Peoples. The Voluntary Guidelines on the Governance of Tenure produced by CFS can be of great value to such efforts. Limiting agricultural expansion will also limit deforestation, desertification and encroachment on sensitive ecosystems.^{xli} A recent HLPE report on agroecological and other innovative approaches for sustainable agriculture and food systems^{xlii} provides evidence on the impacts of different models of production and hence a basis on which to assess the steps that are imperative for a real transformative food systems agenda.

Beyond land, many countries already exploit their water resources at unsustainable rates, thereby jeopardizing the potential for future production, increasing systemic disaster risk. Risks exist in terms of food safety, sanitation, and hygiene as water resources for agriculture compete with those for other activities and for residential areas. Climate change and population growth will exacerbate the competition between water for agriculture and for other uses.

Sustainable and risk-informed management of land and water will promote synergies between different SDGs, such as SDG2, SDG6, SDG11 and SDG15. Agroecological practices offer a comprehensive, integrated solution to land, biodiversity, and the management of water and chemical input. Other practices, such as Climate Smart Agriculture, also address sustainable food system transformation. Context in this case is important and there is no “one-size fits all” solution. What is important is that a substantial paradigm shift is necessary to reconcile growing food needs with the need to strengthen the resilience, sustainability, and diversity of landscapes and the biosphere and reduce greenhouse gas emissions^{xliii,xliv}. This calls for bold changes in practices throughout the agri-food sub-systems to strengthen ecological efficiency and economic viability and improve the livelihoods of those in danger of being left behind.

From a nutrition standpoint, government support to food production (price incentives, research and extension) should be rebalanced to provide incentives to increase production and commercialization of fresher and nutritious foods.

Long-term strategies, policies and programmes are required to promote, for example:

- Abolish harmful input subsidies (fertilizer, pesticides, water) and reform management practices which result their inefficient use;
- Improve resource linkages and enhanced nutrient flows in integrated farming systems, such as rice–fish farming and other crop–livestock systems;
- Support innovative land, water and biodiversity conservation techniques (such as agroforestry, regenerative agriculture, silvopasture, organic agriculture, and non-chemical pest management).^{xlv};
- Promote environmentally sustainable feeds and balanced animal diets that reduce dependence on chemicals and antibiotics;
- When appropriate, support traditional agricultural practices which make a lower contribution to ecological damage and carbon emissions compared to the use of external inputs;
- Encourage low-input and precision agriculture to optimize field-level management and increase productivity (see also STI section);
- Implement policies and scale up investments to ensure the generation and adoption of innovative technologies appropriate for smallholder farmers.

Path-breaking, disruptive innovations have the potential to increase yields and cropping diversity with limited increases in land, water and chemical inputs. Reducing food loss and waste will contribute to resource savings. To ensure sustainable yield increases to meet total demand for food, fiber and energy, significant investments are required in the research and development of new and improvement of existing sustainable technologies and practices. Investments in R&D should go beyond basic cereals to include nutritious foods, such as fruits, vegetables, legumes, pulses etc. which previous policies and investments have overlooked. Practices based on traditional and Indigenous knowledge and methods should also be considered. Additional

investment and conducive policy environment will be needed for, infrastructure, education and skills development.

Agriculture and the AFOLU sectors in general, have a big potential to be an important part of the solution to climate change: carbon sink for mitigation, sustainable soil management, risk-sensitive agriculture practices. Financial and policy support is needed to scale up existing innovative practices farmers are already implementing to cope with the changing climate, so as to overcome trade-offs between adaptation and mitigation practices and economic viability.

In the process of attaining sustainable resource use, global agricultural output is likely to contract, and food prices are bound to rise even if consumption is to be reduced^{xlvi}. Thus, the need for a social agenda.

3. A social agenda in support of food system transformation

To ensure access to food in the face of increased food prices associated with sustainable modes of production, a social agenda needs to be implemented as part of the transformation process. It should take into account the needs, rights and knowledge of Indigenous Peoples and vulnerable groups who are likely to be left behind³. It should ensure the realization of the right to food, the full respect and realization of the UN Declaration on the Rights of Indigenous Peoples, the UN Declaration on the Rights of Peasants and other people working in rural areas and the ILO Conventions protecting the rights of rural workers.

Social Protection to support agri-food system transition

Social protection is a human right and a key foundation of sustainable food systems. It allows households to increase and diversify their food consumption, often through increased own production^{xlvii}. Positive impacts on child and maternal welfare are enhanced when programmes are gender-responsive or targeted at women. This is especially important because maternal and child malnutrition perpetuate poverty from generation to generation.

When well implemented, risk-informed, shock responsive, regular and predictable, social protection facilitates increased access to inputs, tools and livestock, and capital for small non-farm enterprises as it provides insurance against some risks and alleviates credit constraints. This has positive ripple effects on local communities and economies and puts in motion a virtuous circle of local economic growth. There is also ample evidence that effective social protection systems support small farmers in adopting more sustainable technologies by closing the gap between short term investment costs and longer-term benefits.

Poverty reduction and moving towards more equitable societies

Poverty can be linked to environmental degradation in low-income countries, and sustainability cannot exist without poverty reduction. Despite strong agricultural productivity growth, extreme poverty in rural areas has seen only modest improvements due to extreme inequality and lack of inclusion of the rural poor in the productivity gains. Programmes, such as the UN Poverty–Environment Initiative, especially projects that promote innovation in family farming and encourage a renaissance of rural economies and territories, need to be strengthened, as they not only help reduce poverty but also contribute to preserving ecosystems and promoting environmentally and culturally sustainable economic growth.

³ For a definition of vulnerable groups see footnote number 1 above

Alleviating constraints faced by family farmers and other small-scale producers is critical. The world's more than 500 million smallholder farmers, fisherfolk, pastoralists, Indigenous Peoples, and food and agricultural workers, are at risk of being left behind in the process of structural and rural transformation. However, they are key to agri-food systems and in some regions such as SSA and Asia they produce as much as 80% of food.^{xlviii}

In this context, some key actions include^{xlix} :

- Bridge the short-term costs between adoption of sustainable technologies and longer term returns through credit lines, loan guarantees, insurance schemes and social protection that is also risk-informed and shock responsive.
- Improve the position of family farmers, small-scale and indigenous food producers and SMEs in the value chains and increase the benefits from accessing wider markets and linking the advantages of rural economies with those of urban ones, while strengthening local food systems and domestic markets^l
- Improve equitable and sustainable access to land and connected natural resources along the lines of the CFS Voluntary Guidelines on Responsible Governance of Tenure of Land, Fisheries and Forests. The “Guidelines” require that investments contribute to sustainable and inclusive economic development, the eradication of hunger and poverty, access to safe and nutritious food, equality and empowerment at all levels, resilience^{li}
- Ensure protection of food and agricultural workers’ rights and decent labor conditions in accordance with ILO Conventions and their right to safe and healthy work.
- Implement public procurement processes to buy food from local family farmers and small-scale producers for school and other government-supported meal programs.

Reducing inequalities is not just a moral imperative it is an investment in the promotion of economic growth and overall wellbeing. Bold steps need to be taken to ensure equitable access to assets and opportunities for marginalized vulnerable groups. Eliminating inequalities in access to health care public services and infrastructure will increase productivity and reverberate across many SDGs. Access to healthy diets, will increase with more equitable distribution of income and wealth within and across countries.

d) Addressing cross-cutting issues

Investing in gender equality and wellbeing

Promoting women’s rights and gender equality, including increasing women’s control over resources and their participation in decision making processes at all levels is a fundamental human right and an investment in productivity and growth. It is also an investment which is conducive to poverty reduction which, in a positive feedback loop is essential for health and wellbeing, adequate nutrition for women and children, families and communities. Implementing international legal instruments, such as CEDAW, is crucial. Gender-related actions involve investing in adolescent, maternal and child health and nutrition; improved education for women and girls; ensuring sexual and reproductive rights and access to health services and products; and improved access to finance, appropriate technology and agricultural extension services targeted to the needs and constraints of female farmers, workers and rural entrepreneurs taking into account their role as household managers and participants in agri-food system activities.

Three steps are necessary to strengthen the gender policy landscape in relation to food security and nutrition: (a) increase awareness among policy makers on the links between women’s human

rights, Gender Equality and Women Empowerment (GEWE), and food security and nutrition; (b) enhance coordination, collaboration and consistency of objectives and implementation strategies between (GEWE) and the food security and nutrition policy domains; and, (c) establish working relationships among institutions and stakeholders across government and civil society.

Creating opportunities for (rural) youth

In order to take advantage of the demographic dividend, investment in the potential and capabilities of rural youth must dramatically increase and be made more effective. Making quality education and vocational training (including in agricultural technological progress) more accessible, in particular for adolescent girls and young women, will be of critical importance in boosting young workers' productivity and facilitating their transition into more remunerative employment in higher-value-added sectors and services within and outside food systems.

Maintaining interest of young people in farming but also creating a conducive environment for youth to be employed in the rural areas, including small cities and rural towns, will depend to a large extent on the development of food systems across the rural-urban continuum^{lii}. A dynamic agro-industrial sector (primary production, processing, logistics, transport, distribution) and growth of services in rural areas, will create employment and income in local economies for young people and will reduce the gap between rural and urban standards of living by keeping youth from push-migration to larger cities. New, innovative systems of territorial governance that cuts across regions, administrative boundaries, and levels of authority need to be explored.

Leveraging food systems for resilience in conflict situations^{liii}

Deep economic, social and political crises can unfold where the root cause of the conflict is competition over natural resources, including rights to land or water resources. Policies should address these root causes and aim to mitigate – and, if possible, prevent – their impact on food systems, food security and the economy at large by addressing the root causes of the conflict. As agriculture is the mainstay of livelihoods in many countries affected by conflict, interventions should prioritize investment in preventing the creation of new risk, reducing existing risk, and improving the resilience of the sector.

There is a need for policies and scaled-up programmes aimed at reducing underlying vulnerability and exposure and building and strengthening resilience to shocks and stressors in order to prevent long-lasting consequences on food security and nutrition. Strengthening social policies and protection systems will be critical, as households' own coping capacities tend to be considerably reduced in situations of violent conflict. Unless these programmes are in place, individuals and households pushed by sheer need for survival and livelihood protection may engage in detrimental coping strategies which include degradation and destruction of natural resources that threaten future livelihoods, food security and nutrition. Responses should be supportive of wider peace processes and contribute to sustaining peace, demanding conflict-sensitive approaches and ensuring that the role of women is sufficiently recognized.

Leveraging food systems for overall development

Agricultural sectors and the food systems continue to be important for employment and income generation in low- and middle-income countries. However, they alone often can no longer provide enough jobs or income-earning opportunities, especially for the young population in search for decent employment and sustainable livelihoods.

By 2030, 3.4 billion people will live in rural areas but the bulk of them will live close to an urban center. Small and medium urban Centers (SMUCs), will increasingly house important components

of the agri-food system of great value to the development of local agriculture namely a very large and increasing numbers of small and medium size enterprises: local traders that link agriculture to the broader wholesale and retail markets, public services, small businesses doing food processing and selling inputs and services to agriculture and livestock, transport and logistics etc^{liv}. Overall, employment in agri-food systems in its entirety (including all related activities along the value chains) may represent about half of employment worldwide.^{lv} SMUCs are a source of off-farm employment and employment diversification for agricultural and rural household members, which helps keep youth in agriculture and in rural areas and stemming mass migration to megacities and abroad. The process can be facilitated through support of sustainable local and family food production, promotion of sustainable agro-industries and setting up the territorial infrastructure needed to interconnect rural areas, small cities and towns, so that rural populations can benefit from structural transformation and urbanization.

5. Means of implementation and the global partnership: mechanisms and partnerships to accelerate progress

The GSDR 2019 emphasizes that all stakeholders should work to make substantial changes to existing infrastructure, policies, regulations, norms, and preferences so as to ensure full inclusion and participation in planning and action for a transition towards food and nutrition systems that foster universal good health, ensure food security and eliminate malnutrition while minimizing negative environmental impacts. The 2030 Agenda highlights the need to strengthen the means of implementation, such as finance, know-how and technology transfer, as well as human and institutional capacity-building, and to revitalize the inclusive global partnership for sustainable development. Countries, especially developing countries, will require support to accelerate progress with regard to ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture in the context of the UN SDG Decade of Action and others, for example the UN Decade of Action on Nutrition and the UN Decade of Family Farming.

a) Partnerships

Existing and new partnerships and initiatives should be coherent with the vision of sustainable food systems transformation articulated above. These partnerships could be reinforced and new ones established, while working in a more inclusive, participative and collaborative way with the most critical constituencies on the ground, such as the organizations of farmers, especially smallholder and family farmers, women, youth, Indigenous Peoples, pastoralists, fisherfolks, agricultural and food workers, and the poor. Critical interventions on food security and nutrition at all levels, should take into account the needs, rights, agency, knowledge and participation of those people most concerned, in the spirit of the reformed CFS: “nothing about us without us”.

Public-private partnerships will continue to be an essential element of successful transformation. At the same time significant power imbalances exist within in the food systems. Policy frameworks should clearly distinguish among and ensure appropriate roles for different actors in public policy making and programme implementation. A key element in this is the adoption of robust safeguards to protect against conflicts of interest and uphold the public interest and human rights orientation of public policy.

b) Financing the transformation

Estimates of the costs of building food systems that can lead to the achievement of the relevant SDGs fall in the range of US\$ 1.5–2.5 trillion per year of additional investments in developing countries alone.^{lvi} The question remains how to finance these investments^{lvii} and how to align

financial interests with sustainable development. While global investment regimes are important, cross-border investments pale in comparison to current levels of domestic investment, especially by small and family farmers. Therefore, transforming food systems requires a vibrant mix of policies and fiscal interventions.

With a focus on developing countries, there are four actions that can be pursued. First, countries should implement public expenditure reviews focused on sustainable food and agricultural systems to realign priorities and spending both in developing countries and in developed countries. A second recommendation should be to review the operation of rural financial markets and financing of local value chains in order to remove some of the obstacles impeding the funding of the required food systems transformations. A third action item could be the strengthening of fiscal space by tackling illicit financial flows, conducting debt sustainability assessment and, if necessary, comprehensive restructuring and exploring new forms of domestic resource mobilization. A fourth action item could be the creation of a project preparation and support facility to develop a pipeline of country-specific projects, and in general to structure financial vehicles, that can help mobilize private sector funds from different type of impact investors and related operations with environmental, social and governance (ESG) objectives. The level of funds available can be very large.^{lviii}

c) The role of Science, Technology and Innovation (STI)

The 2019 Global Sustainable Development Report identifies science and technology as one of the levers for transformation to accelerate progress in achieving the SDGs and recognizes that its strategic deployment has the potential to resolve and minimize trade-offs among the Goals. Science, technology and innovation (STI) is particularly essential to overcoming the adverse impacts of climate change and other challenges that prevent countries from achieving food security, improved nutrition and sustainable food and agriculture systems that exert least pressure on the environment.

In addition to strengthening and revitalizing Indigenous and traditional knowledge systems, science and technologies, other existing, new, and emerging sustainable technologies can improve food system resilience and address the four dimensions of food security, namely availability, access, utilization, and stability. New technologies, which include conservation agriculture, integrated soil fertility management, integrated farming systems, animal disease control and integrated pest management, precision agriculture, irrigation, livestock management and biotechnologies, aim to make agriculture more resilient and productive and crops and farm animals more tolerant to diseases, pests and environmental stresses, including the impacts of climate change.^{lix} In addition, space-derived geospatial data and information, space technology and its applications that provide information for decision-making in agriculture, horticulture, fishing, aquaculture and forestry, and contribute to yield forecasting and risk assessments of pest, disease and other threats and improve the productivity and resilience of food production, can complement local and traditional knowledge systems in combination with other sources of data and information from terrestrial applications. However, the introduction of new technologies must be based on the precautionary principle, as well as considerations of long-term sustainability, respect for traditional and indigenous knowledge systems and ecosystems, rights and needs of local and indigenous communities as well as biodiversity conservation and should ensure equitable access to technology and relevant capacity development. Strengthening of STI, with due consideration to local and indigenous rights and needs, requires investments in research and development, biosafety and biosecurity, human capital, infrastructure and knowledge flows to ensure their sustainability and safe use.

d) Recommendations for action

- A comprehensive and integrated agenda to put the food systems on a sustainable path should involve a combination of tools, actors and solutions adapted to diverse contexts as per Goal 17. They should be accompanied by changes in behaviours and mindsets and individual and collective action involving all participants in the food systems and beyond.
- Disaster risk-informed, transformative actions are needed to simultaneously support the end to hunger and malnutrition and sustainable management of natural resources and rights-based approaches.
- Accelerating progress in transforming agri-food systems towards a sustainable path and the progressive realization of the right to adequate food will take strong political will and the ability to build consensus and coherence of action among several stakeholders (vertically and horizontally).
- Enhanced modalities to strengthen accountability are in order to avoid short-term vision and the free-rider problem.
- Policy should play a key role in providing incentives and strengthening capacities to steer transformative changes. Refocusing coordination mechanism requires urgent and real commitment and political drive to place food systems and nutrition higher in the political/development agenda nationally and globally.
- Multisectoral/cross-institutional policies, actions and investments should be used to deal with cross-cutting issues as appropriate: health, education, environment, agriculture, social protection, planning and economic policy sectors.^{lx}
- Integration of nutrition in policies and programmes for health, but also policies oriented towards sustainable food systems within (universal) health coverage offers the potential to greatly expand nutrition coverage and boost health diets and positive health outcomes.
- Comprehensive governance bodies should bring constituencies and authorities across the rural-urban continuum together to design and implement needed policies and programs. Such institutions should balance the need for participatory yet effective governance. They should have a clear mandate and/or specific legal status and accountability mechanisms in accordance with their power to enforce policies and programmes which involve multiple institutions.
- Stakeholders involvement should include participation in decision-making of new partners with increasing power and influence (farmers, private sector, civil society, Indigenous Peoples), while taking into account their needs and rights and establishing robust safeguards against potential conflicts of interest.
- Much greater commitment to cooperation is necessary by all development partners including support to developing countries in following up on commitments and addressing tradeoffs and risks.
- Ending malnutrition in all its forms, including the hidden hunger of nutrient deficiency, requires national commitments to invest at scale.
- Rural areas should not be left behind. Investment in education, infrastructure, health care, clean water, sanitation and energy will support private investments in agriculture and small and medium enterprises thus revitalizing the rural space and encouraging youth to stay.
- The food system transformation process should tap into the significant increases in the level of official financial flows to low-income countries and make use of international private finance, in the form of foreign direct investment (FDI), bonds and syndicated bank lending with longer maturities, and flows from private philanthropy from foundations and NGOs^{lxi}.

- International cooperation to combat illicit financial outflows which exceed ODA and foreign direct investment (FDI) in lower middle-income countries (LMICs) will expand the fiscal space to support transition of food systems.
- There is a need to ensure that public sector budgets and banking sectors support the needed transformation in food systems to achieve the SDGs, while structuring the projects and financial vehicles that can help mobilize private sector funds.
- Investment in other land-and-water-abundant countries to gain direct access to food supplies needs to be regulated in order to maximize both economic and social benefits, while minimizing risks for both investing and recipient countries.^{lxii}
- Highly effective investments include nutrition for the maternal-infant dyad, promotion of breastfeeding, fortification of foods and school food and nutrition programmes.
- Key attention should be placed in promoting systemic reforms in accordance with the Addis Ababa Action Agenda on Financing for Development, that can strengthen policy, fiscal and judicial space of developing countries for the pursuit of their food system transformation agenda.
- Small and medium scale actors within local food systems in all regions should be supported through capacity-building efforts and access to targeted funding and catalytic resources which will not push them into debt.
- Data, information and full participation are crucial to promote transparency in the policy process, the monitoring and evaluation of policies and programmes to establish accountability and to identify and target vulnerable groups. It is vital to secure free access to reliable and timely information and data accompanied by all required legislative, administrative, technological, operational and resource related considerations in place.

ⁱ See: <https://data.worldbank.org/indicator/NY.GDP.PCAP.KD>

ⁱⁱ Source: FAOSTAT- see: <http://www.fao.org/faostat/en/>

ⁱⁱⁱ Hunger and undernourishment are used interchangeably here to signify insufficient caloric intake to lead a healthy and active life while undernutrition includes insufficient intake of macro and micro-nutrients.

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^{vi} United Nations. 2020. Progress towards the Sustainable Development Goals -Report of the Secretary-General: Available at:

https://sustainabledevelopment.un.org/content/documents/26158Final_SG_SDG_Progress_Report_14052020.pdf

^{vii} Ibid.

^{viii} See: <https://www.unescwa.org/publications/tracking-food-security-arab-region>

^{ix} Black, R.E. et al. 2008. Maternal and child undernutrition: Global and regional exposures and health consequences. The Lancet. 2008; 371:243-260

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^{xi} FAO. 2019. The State of Food and Agriculture: Moving Forward on Food Loss and Waste Reduction, Rome 2019, Available at: <http://www.fao.org/3/ca6030en/ca6030en.pdf>.

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- ^{xx} United Nations Convention to Combat Desertification. 2017. The Global Land Outlook, first edition. Bonn, Germany.
- ^{xxi} About 80% in Africa and 92 percent in India (Reardon)
- ^{xxii} UNDRR. 2019. Global Assessment Report on Disaster Risk Reduction. Available at: https://gar.undrr.org/sites/default/files/reports/2019-05/full_gar_report.pdf
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