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Agriculture development, food security and nutrition**Agriculture development, food security and nutrition****Report of the Secretary-General***Summary*

World hunger is on the rise after several years of decline. Urgent actions are needed to ensure sustainable food production systems, revitalize the agricultural sector, promote rural development and empower traditionally excluded groups, in particular, smallholder farmers and small-scale producers within local food systems. Nutrition is also in the spotlight as a key component of these efforts. The present report highlights interlinkages across the Sustainable Development Goals as a means to address key challenges and accelerate progress and outlines key means of implementation to end hunger, achieve food security and improved nutrition and promote sustainable agriculture.

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I. Introduction

1. In its resolution [72/238](#) on agriculture development, food security and nutrition, the General Assembly requested the Secretary-General to report to the Assembly at its seventy-third session on the implementation of the resolution and called upon the relevant organizations of the United Nations system, within their respective mandates and resources, to ensure that no one was left behind and no country was left behind in the implementation of the resolution.

2. In providing information and annual updates on global efforts to achieve the internationally agreed goals on agriculture development, food security and nutrition, in alignment with the 2030 Agenda for Sustainable Development (resolution [70/1](#)), the present report includes contributions from the Food and Agriculture Organization of the United Nations (FAO), the World Food Programme (WFP), the International Fund for Agricultural Development (IFAD), the High-Level Panel of Experts of the Committee on World Food Security, the World Trade Organization (WTO), the United Nations Convention to Combat Desertification, the United Nations Children's Fund (UNICEF), the Standing Committee on Nutrition and the Scaling-Up Nutrition movement; it also draws from inputs to the high-level political forum on sustainable development and other sources, including the secretariat of the Department of Economic and Social Affairs.

II. Overview

3. After a prolonged decline, world hunger appears to be on the rise again. In *The State of Food Security and Nutrition in the World 2017* report, jointly issued by FAO, IFAD, UNICEF, WFP and the World Health Organization (WHO), it is estimated that the prevalence of undernourishment — corresponding to Sustainable Development Goal indicator 2.1.1 — increased to 11 per cent in 2016 from 10.6 per cent in 2015. This represents an increase to 815 million undernourished people worldwide in 2016, up from 777 million in 2015, but still down from 900 million in 2000. Trends show that severe food insecurity disproportionately affects rural areas, where populations are also heavily impacted by poverty, and that rural women in particular are the most affected by both food insecurity and poverty in all regions. Their livelihoods mainly depend on agriculture, with smallholder family farmers providing the vast majority of the food consumed by local rural communities and the urban poor.

4. Disasters and the effects of climate change can also severely affect vulnerable populations. Strengthening the resilience of rural communities and promoting the preservation and restoration of resources and ecosystems have key importance for ensuring the wellbeing of vulnerable segments of the population, in particular in rural areas and in countries in conflict or emergency situations. According to *The State of Food Security and Nutrition in the World 2017*, an estimated 689 million people in the world (9.3 per cent of the world population) experienced severe food insecurity, according to the global Food Insecurity Experience Scale, which is the tool used to produce Sustainable Development Goal indicator 2.1.2. The highest levels of severe food insecurity are in Africa, where it affects more than one quarter of the population — almost four times the levels found in any other region.

5. It is estimated in the 2018 *Global Report on Food Crises*¹ that the number of people experiencing crisis food insecurity rose in 2017 from 108 million people in 48 countries to 124 million people in 51 countries. Vulnerable populations in four countries faced a risk of famine — in north-eastern Nigeria, Somalia, South Sudan

¹ Food Security Information Network (2018).

and Yemen. Some 30 million people in those four countries alone experienced severe hunger, largely driven by conflict and exacerbated by climate-related events. The global humanitarian community mobilized around \$2 billion to contain famine in South Sudan and avert it in the other three countries. Nearly 15 million people in the four countries were reached through a mix of cash and emergency livelihoods support. With approximately 80 per cent of the affected populations in the four countries relying on agriculture, support to safeguard livelihoods, increase local food production, protect and enhance nutrition and ultimately save lives was essential. Despite the massive humanitarian response, the number of people in crisis food insecurity in the four countries rose throughout the year by a further 5 million, demonstrating that, while humanitarian assistance is crucial to avert famine and save lives, it is not sufficient on its own to address the root causes of hunger and starvation.

6. It is not yet clear whether this recent uptick in hunger forecasts the beginning of an upward trend or whether it reflects an acute, but temporary, aberration. What is clear is that economic slowdown, gender inequalities, armed conflict, drought and other weather-related disasters linked to climate change are among the key factors contributing to a reversal in the long-term progress in fighting global hunger, making the prospect of ending hunger and malnutrition by 2030 more difficult.

7. Malnutrition manifests itself in various forms, with children's malnutrition having particularly serious and long-term consequences for the world's population. While declining in almost every region, stunting still affects one out of five children under 5 years of age, with three quarters of these children living in Southern Asia and sub-Saharan Africa. No substantive decrease is observed in wasting, while obesity is increasing, often coexisting with undernutrition and other forms of malnutrition. Currently some 1.3 billion people are classified as overweight and 600 million as obese. These numbers are expected to double by 2030. Overweight and obesity are linked to diet-related non-communicable diseases such as diabetes, hypertension, cardiovascular disease and many types of cancer.

8. The drivers of overweight and obesity are largely to be found in unhealthy diets often conditioned by existing food systems and food environments — the physical, economic, political and sociocultural context in which consumers engage with the food system — that might limit consumers' purchasing power or the availability of food and, thus, influence their dietary choices. Rapid urbanization and lengthening food value chains, changing lifestyles and rising incomes are combining to produce a dietary transition that features increased reliance on processed foods high in fat, sugar and salt content and nutrient-dense food, in particular dairy and animal proteins, that far exceed daily requirements.

9. Food safety and the impact of unsustainable practices of food systems on animal and human health are also matters of serious concern. Worldwide, one in 10 people falls ill and 420,000 people die every year owing to contaminated food, with children under 5 years of age accounting for almost one third of mortality.² The burden is particularly heavy in the same regions affected by extreme poverty and hunger. Overuse or misuse of pesticides and other chemicals in crop and feed production, inappropriate use of veterinary drugs such as antibiotics in animal production, including in livestock and aquaculture, the massive concentration of farm operations and growing trade in both plant and animal-based food and feed, resulting in longer food/feed chains have significantly increased the risks to human and animal health from food systems. These risks include the emergence and spread of antimicrobial resistance and the rapid international spread of foodborne disease outbreaks. Other pressing risks include the increasing or persistent problems of mycotoxins, marine

² WHO *Estimates of the Global Burden of Foodborne Diseases* (Geneva, WHO, 2015).

biotoxins and zoonotic diseases. Climate change is also affecting food safety through many other pathways.

10. Depletion of biological diversity is also heavily affecting food security. Biodiversity can play a key role in ensuring food and nutrition security, the sustainability of food and agriculture systems and the resilience of ecosystems and communities, as well as increase benefits across other dimensions of sustainable development.

11. Conserving the genetic diversity of plants provides the basis for adapting crops to future changes in environmental conditions or in demand for products and services. At the end of 2017, global holdings of seeds and other plant genetic materials conserved in 90 countries and 16 regional and international centres totalled 4.89 million samples, representing a 1.0 per cent increase over the previous year. An increase in the germplasm conserved under medium- or long-term conditions has been observed in 31 countries. However, overall modest progress has been made in securing crop diversity. The number of countries reporting under the International Treaty on Plant Genetic Resources for Food and Agriculture increased by 9.7 per cent, reflecting a better awareness of the importance of conserving and monitoring ex situ holdings.

12. Genetic diversity in livestock species is equally important to enable their survival in diverse contexts, reducing risks for human and animal health, and to provide a wide range of products and services (food, fibres, manure, etc.). It also provides the basis for adapting livestock populations to future changes in environmental conditions or in demand for products and services. Across the world, however, 67 per cent of local breeds (i.e., breeds occurring in only one country) are classified as of unknown status, meaning that basic data on breed population is unavailable. Of the local breeds whose risk status can be assessed, 26 per cent are at risk and only 7 per cent not at risk.

13. Smallholder family farmers continue to be disproportionately impacted by food insecurity, with unequal access to land and other productive resources. Globally, there are 570 million family farms, and the vast majority of those farms are less than 2 hectares of land. They produce over 70 per cent of food and account for almost all food consumed by rural communities and urban poor, but use roughly 30 per cent of available agricultural land, often less fertile, while farms of more than 50 hectares use two thirds of arable land.³ Extreme poverty also continues to be concentrated in rural areas and is one of the main drivers of hunger; more than three quarters of the extreme poor live in rural areas, with the majority of this group deriving their livelihoods, to at least some extent, from small-scale farming. Lack of adequate investment and enabling policies keeps smallholders vulnerable to shocks, including the effects of weather-based events, climate change and conflict and contributes to the persistent lack of resilience of local food systems and smallholders' livelihoods.

III. Accelerating progress, closing gaps and overcoming challenges by addressing interlinkages among the Sustainable Development Goals

14. Ending poverty and hunger in all their dimensions are the top priorities of the Sustainable Development Goals. Today some 767 million people live below the

³ FAO — The state of food and agriculture 2014: Innovation in family farming (2014); Samberg and others, 2016, "Subnational distribution of average farm size and smallholder contributions to global food production", *Environmental Research Letters*, vol. 11, No. 12 (November 2016). Available at <http://iopscience.iop.org/article/10.1088/1748-9326/11/12/124010/meta>.

extreme poverty line.⁴ Some 80 per cent of the extreme poor live in rural areas, and most depend on agriculture — crops, fisheries, livestock and forest resources — for their livelihoods, but levels of productivity and income that are often inadequate to reduce either poverty or hunger. Ending poverty requires raising rural incomes and increase productivity sustainably as to transform rural livelihoods. Inclusive and sustainable development of agriculture and food systems can and must play a critical role.

15. It is critical to ensure that trade-offs across Sustainable Development Goal 2 targets and among different dimensions of sustainability impacting on food security are identified. Competing use of resources, including land and water, present challenges to balance the needs to increase production to meet increasing food demand while sustainably managing and using natural resources, biodiversity and ecosystems, to balance the affordability and quality of food available. These are among emerging challenges faced in the implementation of policies, programmes and plans on food security and nutrition and on sustainable agriculture in the context of the Sustainable Development Goals.

16. Achievement of Sustainable Development Goal 2 is also closely linked to other key dimensions of sustainable development, in particular the sustainable management and use of natural resources and ecosystems. The 2030 Agenda recognizes that poverty eradication, food security, nutrition, health, agriculture, water, energy, climate change and sustainable management and the use of terrestrial and marine and ecosystems must be addressed holistically, using systems thinking and integrated approaches. The development of resilient and sustainable food systems, integrated territorial development and stronger rural-urban linkages are of paramount importance for achieving the 2030 Agenda.

17. As the world population becomes more urbanized, the demand for food and natural resources is increasingly concentrated in urban areas. Rural and peri-urban areas, through sustainable agriculture, forestry and fisheries, will play an important role in meeting this increasing demand. The importance of rural-urban linkages and the role of food and agriculture were acknowledged in the New Urban Agenda, connecting Sustainable Development Goals 2 and 11 and linking to others as well. The rapid and haphazard manner in which towns and cities are expanding is creating challenges, such as rising social inequalities, which will lead to higher absolute numbers of poor and hungry people in urban areas than in rural areas. Inequalities particularly affect small-scale actors working in agriculture and food systems, at least in part due to the rural location of many of these activities in the presence of persistent rural-urban inequalities and lack of effective rural-urban linkages.

18. In many rural contexts, the prevailing patterns of land rights, specifically the lack of recognition and protection of the rights of smallholders, in particular women, explain why some people are more vulnerable to hunger than others, especially women and indigenous peoples whose claims on land are often not respected and/or enshrined in norms/customs or in law. This issue, central to achieving Sustainable Development Goal 2, cuts across goals on gender, inclusive economic growth, reducing inequalities, life on land, ecosystems and partnerships. Enhancing the land rights of smallholder farmers is therefore a priority, in particular for supporting local food systems, maintaining food and agrobiological diversity and maintaining the nutritional benefits associated with traditional diets.

19. Women producers are even more likely impacted by the non-fulfilment of their rights — in particular, rights over land, other productive resources and services, decent work and participation in political processes at all levels. This represents a lost

⁴ World Bank, *Taking on Inequality, Poverty and Shared Prosperity* (Washington, D.C., 2016).

opportunity, as evidence shows that, when enabling conditions are in place, these actors are key agents of change promoting food security and nutrition, as well as inclusive — and employment-generating — economic growth.

20. Agroecological approaches can support biodiversity conservation and sustainable water management while reducing reliance on agrochemicals, which is necessary to transform food systems while safeguarding the environment and protecting human health and nutrition. Over 30 countries have already developed public policies that support agroecology, promoting integrated sectoral approaches at the national level. These policies help in scaling up the adoption of agroecological practices. Policies for agroecology often include mechanisms of interministerial cooperation in support of an integrated approach, innovative governance arrangements that involve family farmers and other food system actors in policy deliberations and territorial approaches in support of context-specific and integrated solutions. By optimizing biological synergies that integrate crops, trees, livestock and fisheries and aquaculture, farmers using agroecological practices enhance ecological functions, leading to greater resource-use efficiency and resilience by managing ecosystem services that are frequently mobilized using landscape-scale conservation.

21. Disasters affect all dimensions of food security, including economic and physical access to food, availability and stability of supplies and nutrition. Disaster losses are accentuated in poor households and communities and result in long-term consequences for food security, health, education and other critical dimensions of human welfare. Climate change acts as a multiplier of existing threats to food security and nutrition. It will make extreme weather events more frequent and intense, land and water more scarce and difficult to access and increases in agricultural productivity even harder to achieve. This could potentially accelerate urbanization and intensify conflicts over even more scarce resources, likely leading to new humanitarian crises, migration and displacement.

22. Climate change will disproportionately impact the most vulnerable people, especially women and children, and their livelihoods — ultimately putting hundreds of millions of people at risk. By 2050, the risk of hunger and child malnutrition could increase by up to 20 per cent due to climate change. Emphasis on increasing food production must be matched with equal emphasis on protecting lives and livelihoods and on ensuring that the poorest and most vulnerable have adequate access to adequate food and nutrition. Countries must move from managing disasters to managing risk, in order to help people and communities build their resilience. While humanitarian response to crises save lives and protects livelihoods, underlying vulnerabilities — such as high levels of exposure to disaster risk and gender inequality — often persist. Addressing them requires comprehensive, multi-year and multi-partner action, led by national Governments and local communities.

23. Fisheries are extremely vulnerable to environmental degradation, climate change and overfishing. Overfishing not only reduces food production, but also impairs the functioning of ecosystems and reduces biodiversity, with negative repercussions for sustainable social and economic development. To achieve sustainable development of fisheries, fish stocks must be maintained within biologically sustainable levels — at or above the abundance level that can produce maximum sustainable yield. According to an FAO analysis of assessed stocks, the fraction of world marine fish stocks that are within biologically sustainable levels has declined from 90 per cent in 1974 to 68.6 per cent in 2013, requiring a strong strategy and stringent management to restore the overfished stock.

24. Water stress affects countries on every continent. Not only does it hinder the sustainability of natural resources, it also hampers economic and social development, disproportionately affecting the most disadvantaged people. Western Asia and

Northern Africa, as well as Central Asia and South-East Asia, are the regions with over 60 per cent water stress, meaning that they face serious water stress, at least during parts of the year. Most other regions are below that threshold, however, and the majority remain well below 25 per cent of initial water stress.

25. Agricultural biodiversity — the diversity of plants, animals and other organisms used for food, both cultivated and wild — is a critical element in response to global malnutrition and underpins healthy, nutritious and sustainable diets. It is essential to nutrient rich diets. It contributes to general ecosystem balance, functioning and service and is critical to the resilience of agricultural production systems and their adaptation to climate change. Agricultural biodiversity is created, managed and nurtured by indigenous peoples, pastoralists, forest dwellers, fisherfolk and smallholder farmers, who produce most of the world's food.

26. At the 2018 high-level political forum on sustainable development, the Ministerial Declaration adopted by Member States acknowledged that the success of the biodiversity-related targets depends on action from all sectors, such as agriculture, livestock, forestry, fishing, tourism, urbanization, manufacturing and processing industry, health, infrastructure, mining and energy development, and cannot be achieved without mainstreaming biodiversity across these sectors and by being included in national plans and local strategies.

27. Land degradation should be given global priority, particularly since global assessments of land degradation indicate that that it is worsening in many regions. About one fifth of the Earth's land surface covered by vegetation showed persistent and declining trends in productivity from 1998 to 2013. In some cases, advanced stages of land degradation are leading to desertification in dryland areas, in particular in the grasslands and rangelands. Ecosystem services to support food production are under pressure, with 33 per cent of soils moderately to highly degraded and freshwater ecosystems adversely impacted by water extraction for agriculture and other uses and by pollution.⁵ An estimated 2 billion hectares — equivalent to 17 per cent of all biologically productive land — could benefit from restoration. Achieving land degradation neutrality (Sustainable Development Goal 15.3) can serve as an accelerator to achieve other Sustainable Development Goals and supports the principle of leaving no one behind.

28. The impacts of land degradation on food security mainly affect the rural poor and leave them more vulnerable to climate change, and the impacts are likely to persist over several generations. Hunger can contribute to violence by exacerbating tension and grievances. In its recent resolution [2417 \(2018\)](#), the Security Council recognized the need to break the vicious cycle between armed conflict and food insecurity, while reiterating its primary responsibility for the maintenance of international peace and security and, in that connection, its commitment to address conflict-induced food insecurity, including famine, in situations of armed conflict.

IV. Working together: global commitments, regional actions

29. The deliberations of global and regional bodies are progressively being aligned with the 2030 Agenda, fostering consistency and coherence of policy decisions and implementation of globally and regionally agreed priorities in line with Sustainable Development Goal targets, using globally agreed Goal indicators to measure impact. In addition, sectoral and cross-sectoral global and regional initiatives are catalysing

⁵ UNEP, *A Report of the Working Group on Food Systems of the International Resources Panel, Food Systems and Natural Resources* (2016).

resources, advancing consensus across constituencies, minimizing trade-offs and sustaining national efforts on sustainable development.

30. The Committee on World Food Security represents a unique and innovative model of multi-stakeholder partnership for enhanced policy and institutional coherence. The High Level Panel of Experts on Food Security and Nutrition provides independent evidence-based reports to the Committee on World Food Security, to inform and support policy convergence. The High Level Panel publications and reports⁶ identify critical and emerging issues for food security and nutrition.⁷ The reports, considered together, provide a comprehensive analysis of the importance of food security and nutrition for sustainable development, by covering related complex issues, controversies and uncertainties. They suggest common definitions, tools, methodologies, pathways and policy recommendations to structure the political debates. They demonstrate, from different perspectives, the critical importance of improving food security and nutrition for all, as both a necessary condition and a cross-cutting challenge to achieve not only Sustainable Development Goal 2, but the 2030 Agenda as a whole. An appendix contains the summaries and recommendations of the 13 reports, providing specific insights on food security and nutrition from different perspectives.

31. The Committee on World Food Security Framework for Action for Food Security and Nutrition in Protracted Crises, endorsed by the Committee on World Food Security in 2015, provides guidance to Governments and stakeholders on how to improve food security and nutrition in protracted crises while addressing underlying causes. To rebuild livelihoods and strengthen resilience of populations, the Framework for Action calls for policies and actions to strengthen sustainable local food systems. It fosters access to productive resources and to markets that are remunerative and beneficial to smallholders and calls for inclusive non-discriminatory and sustained access to relevant basic services such as safe drinking water and sanitation. It calls for the respect of existing rights and the ability of affected or risk populations to access and use their natural resources.

32. The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security promote responsible governance of tenure of land, fisheries and forests, with respect to all forms of tenure: public, private, communal, indigenous, customary and informal. While supporting efforts towards the eradication of hunger and poverty, the Guidelines are also intended to contribute to achieving sustainable livelihoods, social stability, housing security, rural development, environmental protection and sustainable social and economic development. The Guidelines are designed to benefit all people in all countries, especially vulnerable and marginalized people. They provide a framework that States can use when developing their own strategies, policies, legislation, programmes and activities and allow Governments, civil society, the private sector and citizens to judge whether their proposed actions and the actions of others constitute acceptable practices.

33. The Scaling Up Nutrition movement, a multisector and multi-stakeholder platform for coordination of nutrition action, now includes 60-member countries. Some Scaling Up Nutrition countries are experiencing reductions in malnutrition. In 2016 and 2017, Burkina Faso, Ethiopia, Mauritania, Myanmar and Nigeria reported

⁶ Committee on World Food Security, High Level Panel of Experts on Food Security and Nutrition. Available at: www.fao.org/cfs/cfs-hlpe/reports/en/.

⁷ Committee on World Food Security, High Level Panel of Experts, "Critical and emerging issues on food security and nutrition, 2nd ed. (2018). Available at: www.fao.org/cfs/cfs-hlpe/critical-and-emerging-issues/en/.

a significant decline in the number of stunted children.⁸ Some 50 Scaling Up Nutrition countries have an active multi-stakeholder platform at the national level. In 35 countries — nine more than in 2015–2016 — these platforms also work at the subnational level, supporting local actions and implementation, across sectors such as women’s empowerment, agriculture, Water, Sanitation and Hygiene for All (WASH), health, social protection and national development. A total of 16 Scaling Up Nutrition countries have included overweight and obesity in their national policy and strategy documents, reflecting the increasing challenge that obesity poses also in developing countries.

34. The United Nations Decade of Action on Nutrition (2016–2025), was proclaimed by the General Assembly on 1 April 2016, further to a recommendation contained in the Rome Declaration on Nutrition, adopted at the Second International Conference on Nutrition in November 2014. The report of the Secretary-General on the implementation of the Decade ([A/72/829](#)) indicates that the work programme of the Decade was drawn up by FAO and WHO through an inclusive and collaborative process, in line with the guidance given by the General Assembly in resolution [70/259](#), and focuses on six cross-cutting and connected action areas derived from the Framework for Action, also adopted at the Second International Conference on Nutrition. The report also presents commitments already made by Governments and other stakeholders in the context of the Decade. In resolution [72/306](#), the General Assembly recognized the commitments made by Governments and acknowledged the contributions of all relevant stakeholders in advancing the implementation of the Decade and called upon Governments and stakeholders to make ambitious commitments with a view to intensifying efforts and scaling up activities under the work programme for the Decade.

35. On the basis of the successful achievements of the International Year of Family Farming, 2014) the General Assembly, at its seventy-second session, proclaimed the United Nations Decade of Family Farming (2019–2025) through resolution [72/239](#), to serve as a framework for countries to develop public policies and investments to support family farming and contribute to the achievement of the Sustainable Development Goals. FAO and IFAD are developing a plan of action for the Decade through an inclusive, continuous and collaborative process, building upon and connecting the independent initiatives of Governments and their many partners. Potential synergies with the United Nations Decade of Action on Nutrition (2016–2025) are being identified, as well as with other relevant ongoing international processes and instruments.

36. FAO launched the Global Framework on Water Scarcity in Agriculture during the twenty-second Conference of the Parties to the United Nations Framework Convention on Climate Change, held in November 2016 in Marrakesh, as a call for concerted action, in response to the challenges posed by climate change, the vulnerable water resources of which agriculture is the biggest user and a growing world population that needs to be fed. The Global Framework fosters collaboration among partners for the development and deployment of responsive policies, strategies and programmes to enhance field capacity for the adaptation of agriculture to water scarcity, using context-specific approaches and processes tailored to specific circumstances and needs in support of transformational projects.

37. Without healthy soils, capable of fully providing ecosystems services, the Sustainable Development Goals will not be reached. The Global Soil Partnership was established as a mechanism to develop a strong interactive partnership and enhanced collaboration and synergy of efforts on soil among all stakeholders, from land users

⁸ Progress reported from Scaling Up Nutrition countries has been validated by UNICEF, WHO and the World Bank joint malnutrition estimates group.

to policymakers. The Partnership has established nine regional and subregional soil partnerships and has contributed to successful international initiatives for awareness-raising, such as World Soil Day and the International Year of Soils. Several international and global networks have been established, such as the Global Soil Information System, the International Network of Soil Information Institutions, the International Network of Black Soils and the Global Soil Laboratory Network. In addition, annual symposiums are held on the main soil threats in order to gather state-of-the-art information and provide solutions to minimize negative impacts on soils and restore degraded soils.

38. The Comprehensive Africa Agriculture Development Programme has made progress since 2017 on climate-smart agriculture and assessments of the best way to mitigate the effects of climate change and, with the tools and guidelines presented in the agenda set out in *Sustaining the CAADP Momentum to Spur Agriculture Transformation*,⁹ which provides guidance for determining the appropriate set of actions for economic policies to support the implementation strategy and road map to achieve the 2025 vision on the Programme. From this, the Programme initiated the fourteenth Programme partnership platform on 25 April 2018,¹⁰ which brought together stakeholders in African agriculture and food security and sought to consolidate implementation tools and approaches in line with the realization of the added value of the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods of the African Union, with emphasis on mutual accountability mechanisms and platforms.

39. In January 2018, at the African Union summit, the first African Agricultural Transformation Scorecard was launched — a biennial review that aims to contribute to promoting mutual accountability among Member States and other significant stakeholders to the delivery of results on strategic goals and targets, including ending hunger and malnutrition, poverty reduction through inclusive development, promoting trade and building resilience. An important component of this effort is the support being provided to member States to update their national agricultural investment plans, including mainstreaming nutrition, and to the African Development Bank to develop a nutrition scorecard as part of its African Leaders for Nutrition initiative.

40. The implementation, since 2015, of the Community of Latin American and Caribbean States (CELAC) Plan for Food Security, Nutrition and the Eradication of Hunger 2025 promotes comprehensive public policies to reduce poverty, improve rural conditions, adapt agriculture to climate change, end food waste and face disaster risks. Similarly, the consolidation of 19 parliamentary fronts against hunger brings together more than 400 parliamentarians from different political tendencies to ensure food access as a fundamental right. A regional strategy for disaster risk management in the agriculture sector was prepared, also under the leadership of CELAC, in line with the Sendai Framework for Disaster Risk Reduction. The strategy focuses on promoting resilience to natural events and adaptation to climate change, while increasing food security. Both programmes are aligned to the Sustainable Development Goals and rooted in the recognition of complex interlinkages between food security, poverty and climate change.

⁹ Midrand, South Africa, African Union Commission, NEPAD Agency and Comprehensive Africa Agriculture Development Programme, September 2016.

¹⁰ African Union Commission, fourteenth Comprehensive Africa Agriculture Development Programme Partnership Platform, held from 25 to 27 April 2018. Available at: <https://au.int/en/newsevents/20180425/14th-comprehensive-africa-agriculture-development-programme-partnership-platform>.

V. Realizing Sustainable Development Goal 2: means of implementation

41. As identified in both the 2030 Agenda and the Addis Ababa Action Agenda, investments in agriculture are crucial to help improve the sector's productivity. Government expenditures, in particular, are essential to address market failure, improve equity and increase productive capacity. However, the agriculture sector continues to face a growing lag relative to other sectors in its share of government spending and contribution to total economic output. The agriculture orientation index — which measures the central government contribution to the agriculture sector compared with the sector's contribution to gross domestic product (GDP) — fell from 0.38 in 2001 to 0.23 in 2016 worldwide, demonstrating this growing gap. For the 2014–2016 period, the agriculture orientation index was highest in East and South-East Asia (0.43) and lowest in Latin America and the Caribbean (0.15).

42. In 2016, agriculture — including fisheries and forest products — received about 2.4 per cent of the total credit disbursed by commercial banks operating globally. Given that the agriculture sector contributed about 4.2 per cent of global GDP, it appears that agricultural producers received a relatively lower share of the total credit flows to the economy. Access to formal credit is critical for farmers for purchasing inputs, such as seeds, fertilizer, plant protection materials, and animal feed. The lack of access to reasonable credit is particularly problematic for farmers who face a time lag between expenditure on crop cultivation and/or raising livestock and the realization of revenues from the sale of their products at harvest.

43. With regard to foreign aid, donors provided \$12.5 billion to agriculture, forestry and fishing to developing countries. This represents only 6 per cent of all donors' sector-allocable aid, down from nearly 20 per cent in the mid-1980s.

44. Volatility in food prices can have a negative impact on food security. In 2016, 26 countries experienced high or moderately high levels of general food prices. While, in 21 countries, prices for one or more cereal products (maize, wheat, rice, sorghum/millet) were at high or moderately high levels, Sub-Saharan Africa had the largest number of countries with high levels of both food prices and cereal prices. Domestic output declines owing to drought, currency depreciation and conflict all contributed to high prices.

Investment

45. Eradicating hunger will require a significant increase in agricultural investment and, more importantly, it will require improving the quality of investment so that it benefits those that need it most. The Committee on World Food Security Principles for Responsible Investment in Agriculture and Food Systems acknowledges that the starting point for defining how responsible investment in agriculture and food systems can contribute to food security and nutrition is the recognition of and respect for human rights. The set of 10 principles applies to all types and sizes of agricultural investment, including in fisheries, forests and livestock; addresses all stakeholders and applies to all stages of the value chain; is globally applicable and includes actions to address a range of environmental, social and economic issues.

46. As a specialized United Nations agency and international financial institution, IFAD provides financing, mostly in the form of highly concessional loans, for improving the livelihoods of rural populations in developing countries to increase agricultural production and productivity and give small farmers better access to markets and services. The IFAD Strategic Framework 2016–2025 affirms the vision of inclusive rural transformation as a critical aspect of sustainable development and as the basis for the organization's work. The Framework sets three strategic objectives

to guide the work of IFAD over the next decade: to increase the productive capacity of poor rural people; to increase their benefits from market participation; and to strengthen the environmental sustainability and climate resilience of their economic activities. The IFAD Adaptation for Smallholder Agriculture Programme channels climate finance to smallholder farmers, to build their adaptive capacities to withstand, absorb and recover from climate shocks. The Programme is investing in a number of critical areas to build resilience, including systematic climate risk and vulnerability analyses.

Trade

47. Agriculture remains the dominant sector in terms of GDP, exports and employment in many developing countries. Agricultural trade can therefore contribute to achieving the Sustainable Development Goals in numerous ways. Many studies conducted in recent years have confirmed that open and non-distorted trade is a key component in food security strategies, facilitating prompt and reliable access to food produced abroad. In addition, reducing distortions such as subsidies in the agriculture sector can help ensure that farmers adapt to the needs of domestic and global markets. Through efforts to promote market integration, including through the reduction of distorting policies, poor farmers can participate more effectively in global value chains and benefit from improved incomes, while consumers benefit from access to nutritious food at affordable prices. Progress has been made in reducing subsidies that distort global agricultural markets, with agricultural export subsidies more than halved in five years, from \$491 million in 2010 to less than \$200 million in 2015.

48. An open, rules-based trading system is necessary to improve food security. Disciplines included in WTO agreements are an integral part of the rules-based system. The Agreement on Agriculture¹¹ initiated the multilateral reform process for trade in agriculture with a view to establishing a fair and market-oriented agricultural trading system. It has remained the driving force for domestic policy reforms initiated by WTO members to achieve this long-term objective. The Agreement includes provisions that seek to level the playing field for trade in agriculture while ensuring that Governments have policy choices to support their agricultural sectors. It contains rules on market access, domestic support and export competition, as well as export restrictions. Its implementation has helped to contribute to a transparent, undistorted production and investment environment, which is an essential element of food security.

49. While the Agreement has contributed to improving the predictability and transparency of the global agricultural trading system, WTO members aim at strengthening further the legal framework resulting from the Agreement reform process through the ongoing agriculture negotiations. By lowering trade barriers, including trade-distorting subsidies, successful negotiations should facilitate a more favourable global environment for food security and sustainable agriculture, making food supplies more abundant and affordable.

50. Sustainable Development Goal 2 includes a target that explicitly concerns the removal of agricultural export subsidies. Sustainable Development Goal target 2.b urges countries to correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round. At the tenth WTO Ministerial Conference, held in Nairobi in 2015, WTO members delivered a major part of that target by adopting the Ministerial Decision on Export Competition.¹² The

¹¹ Available at: www.wto.org/English/docs_e/legal_e/14-ag_01_e.htm.

¹² WT/L/980. Available at: www.wto.org/english/thewto_e/minist_e/mc10_e/1980_e.htm.

decision eliminates agricultural export subsidies and sets out new rules for export credits, international food aid and exporting state trading enterprises. By ensuring that countries will no longer be able to resort to trade-distorting export subsidies and measures of equivalent effect, the decision will help to level the playing field in agriculture, aiding farmers in many developing and least developed countries.

51. Export subsidy outlays have been following a decreasing trend in the last 15 years to reach record low levels at less than \$200 million annually. Because of the WTO Ministerial Decision on Export Competition, these residual export subsidies will be progressively phased out and will not reappear in the future.

52. The Ministerial Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries¹³ includes various mechanisms for international cooperation and collaboration towards, inter alia, enhancing agricultural productivity and food security with special attention to least developed countries and net-food importing developing countries.

South-South and triangular cooperation

53. In the context of the changing face of hunger, brokering South-South and triangular cooperation is an effective means to advance country-led progress towards Sustainable Development Goal 2. South-South cooperation is critical for accessing and mobilizing the expertise, technologies and financial resources that already exist in developing countries. In order to reach the remaining 815 million people affected by chronic food deprivation worldwide, the knowledge and innovations from the Global South are indispensable.

54. Stronger partnerships are imperative to scale up progress against Sustainable Development Goal 2. South-South and Triangular Cooperation emerges as particularly important to share innovation and knowledge to adapt and scale up sustainable solutions to the problems that rural people are facing in different contexts across the world. IFAD recently established a \$10 million facility for South-South and Triangular Cooperation and launched a rural solutions portal for documenting, sharing and adapting successful experiences in improving the food security, productivity and incomes of rural people.¹⁴

55. While significant progress has been achieved to promote South-South and triangular cooperation in agriculture, food security and nutrition, more needs to be done. As countries need to find new ways to bridge the development-humanitarian-peace nexus in their individual context, South-South and Triangular Cooperation is an effective means to support countries in meeting not only their longer-term development needs but also their humanitarian needs. There are key opportunities for the international community and the United Nations system, for example, to focus stronger on brokering South-South opportunities in areas such as nutrition, social protection and safety nets, emergency preparedness and response, food security analysis and connecting smallholder farmers to markets.

56. Driven by rising country demand, WFP, as well as FAO and IFAD in their Rome-Based United Nations partnership, have stepped up their individual and joint approaches to brokering South-South and triangular cooperation with government for progress on Sustainable Development Goal 2. Driven by rising country demand, 74 per cent of WFP country Offices are actively engaged in supporting host Governments to tap into South-South opportunities, guided by the WFP 2015 Policy for South-South and triangular cooperation — a significant increase from 48 per cent

¹³ Available at: www.wto.org/english/docs_e/legal_e/35-dag_e.htm.

¹⁴ Available at: <https://ruralsolutionsportal.org/>.

in 2014. In support of these efforts, the International Conference on South-South and Triangular Cooperation, on the theme “Leveraging Innovations from the Global South to Support Rural Transformation” was held in Brasilia on 20 and 21 November 2017.

Science, technology and innovation

57. Cash-based transfers are widely recognized as one of the most significant areas of innovation in humanitarian assistance, with huge potential to meet more needs, more efficiently and more effectively. However, innovation requires an appetite for risk (with the accompanying possibility of failure) on the part of implementing agencies and donors. Innovation and technological advances have been central to the growth of cash-based programming, such as the rapid expansion of mobile money, the use of biometrics and more recent attempts to utilize blockchain technology and digital identities. Over the coming years there will be a need for greater focus on enhancing organizational capacity in terms of structures, systems, policies and procedures; enhancing human resource capacity; building capacity of local actors; development of common tools and standards; improving the quality of cash-based transfer programming; strengthening the evidence base; and strengthening the coordination of cash-based transfers.

58. Precision farming (also known as precision agriculture, precision agronomy, or soil- or site-specific farming) refers to the effort to improve farm (and aquaculture, fishery and forest management) practices through the use of a variable combination of smart technologies, including remote sensors, drones with advanced optics, applications such as the normalized difference vegetation index embedded in machinery and equipment, linked through the Internet of things (including soils, plants and animals, e.g., the “Internet of cows”) and guided by geo-referencing systems such as satellite-based global positioning systems and geographic information systems.

59. While the visible components of precision farming — satellite-guided tractors, drones and increasingly sophisticated sensors — have attracted the most attention in the press, the underlying and driving technology behind precision farming is data analytics, enabled by the availability of ever cheaper, more portable and more powerful computational power, and powered by algorithmic learning, artificial intelligence engines and deep learning.

60. Precision farming first emerged as an innovation particularly suited to improving the natural resource and input efficiency of large-scale monocropping of high-yield, genetically uniform crops, with better timed and targeted, and hence reduced, use of water, chemical fertilizers, synthetic fertilizers and pesticides, and with sustainability and farm profitability both improved. Given this initial incarnation, precision farming would seem to have little relevance to the needs of family farmers working on small plots, with very low capital or input intensity. However, precision agriculture available to family farmers could increase their capacity to improve agriculture outputs (and obtain access to data and information in a timely manner), mainstream and monitor more agroecological practices and support an inclusive, more sustainable agricultural transformation.

61. The costs of access to component technologies and systems have declined dramatically, and working systems are available in open source versions that are being adapted to local needs. User interfaces can be localized, and farmer ownership of data can be secured. Developing the potential of precision farming analytics will require that farmers themselves be engaged in new ways. The next step in precision farming is to improve farm management practices beyond current efficiency thresholds by enabling computers to gather sufficient data over time to allow artificial intelligence to recognize, accurately predict and help farmers adapt efficiently to the full range of

possible environmental conditions prevailing at any given moment in order to achieve their goal of a better harvest.

62. The difficulty is that a purely data-driven approach cannot cope with the immense variability and continuous change in farm conditions. The sheer proliferation of data sources and flows presents its own problems: the deluge of data collected from remote sensors changes rapidly in multiple dimensions throughout the season; as a result, it is non-stationary, unstructured, heterogeneous and highly sensitive to the zone, soil, weather and pests, among many other uncontrollable factors.¹⁵ Systems theories that utilize general models of photosynthesis and crop growth are available from research and can be used to generate more robust processing algorithms. However, to become truly efficient in ways that increase resilience and achieve next generation yield, sustainability and income (profitability) improvements, researchers will need to be paired directly with farmers who can work together to adapt the systems, in order to understand local ecologies more holistically and completely.

63. Developing appropriate packages of software and equipment to ease implementation and sustain machine-assisted learning for building both the science and practice of agroecology may prove critical to its wider adoption at production level. At the same time, it is increasingly recognized by leading advocates of the agroecological approach that a focus on the farm level only undermines the overall effectiveness of the approach. To become truly transformative, it is vital that agroecological principles and approaches also operate at the territorial and even food systems levels.¹⁶

64. For policy purposes, precision farming data gathering and analysis can provide the needed evidence base to guide government support. Data can be captured from multiple farms at territorial level and in multiple territories through computing grids. This type of computer-assisted collaboration can make available highly granular data that can be used to strengthen coordination and planning for the sustainable use of natural resources and to improve research, learning and knowledge-sharing. This digital revolution can also aid in validation and certification of good sustainability practices.

VI. Conclusions and recommendations

65. With current trends, hunger will not be eradicated by 2030. Urgent action is needed to recover momentum and accelerate efforts for hunger eradication, good nutrition and sustainable agriculture and food systems.

66. With an increased number of countries facing protracted crisis, there is also an urgent need to scale up collaboration on resilience across the humanitarian-development-peace nexus in order to simultaneously meet immediate needs in crisis contexts and address the underlying causes of food insecurity, through stronger partnerships in the form of joint assessments, joint planning, joint programming and better data sharing initiatives. Innovative tools for emergency response built around information and communications technology and GPS data can strengthen community

¹⁵ Naira Hovakimyan, "Digital agriculture needs a broad community of contributors to succeed", AgFunderNews, 31 August 2017.

¹⁶ C. Francis and others, "Agroecology: the ecology of food systems", *Journal of Sustainable Agriculture*, vol. 22, No. 3 (2003; published online 2008); Manuel González de Molina, "Agroecology and politics. How to get sustainability? About the necessity for a political agroecology", *Agroecology and Sustainable Food Systems*, vol. 37, No. 1 (2013).

resilience to climate and other shocks and contribute to the long-term health of social and economic systems that are the foundation for lasting solutions to world hunger.

67. Small-scale food producers, family farmers and other actors in agriculture and food systems play a key role in promoting food security and nutrition, and the positive impact of their empowerment and engagement in national processes extends to gender equality, community and family health and nutrition, the sustainability of water management and energy and to inclusive economic growth, the sustainability of human settlements, sustainable consumption and production, increased climate resilience, sustainable management and use of terrestrial ecosystems and biodiversity. Collaboration among stakeholders across the rural urban continuum, as well as territorial approaches for sustainable agriculture and food systems, can ensure achievement of food security in both urban and rural areas.

68. Sustainable and inclusive societies can be brought about only through policy, investment and governance frameworks that adopt people-centred, rights-based holistic and multi-stakeholder approaches in which all voices are heard — including those of rural people, women, youth and smallholder farmers. Only in this way is it possible to address systemic inequalities, including unequal access to nutritious food — for example between rural and urban areas, between women and men and between smallholder farmers and more powerful actors across agrifood value chains.¹⁷

69. Consistent and specific actions and governance arrangements at all levels can be put into effect to make national and local actions efficient, to boost learning processes and stimulate synergies, to address trade-offs and to implement risk prevention mechanisms. Working alongside local institutions such as women's groups and water-user groups, prioritizing grassroots, and even household-level interventions, offers the most scope for addressing rural actors' rights.

70. Investing in nutrition through agriculture is not only socially responsible, but also sound development policy and good economics. Its impact is multigenerational, allowing children to reach their full physical and intellectual potential, so that they can grow into healthy adults and lift themselves out of poverty. It is important that all understand the importance of a multisectoral approach.

71. Enabling policies and targeted investments are required for smallholders and other actors across agrifood value chains to provide access to financial services, markets, training and risk management tools, which represent solid returns on investments in terms of local improvements in food availability, access and nutrition outcomes.

72. The scientific community, in partnership with the private sector and other actors, can strengthen capacity for data collection in accordance with the Sustainable Development Goal indicators, including the provision of baselines, which are essential for designing, implementing and monitoring adapted pathways and solutions at different scales.

73. It is recommended that Governments work together with relevant actors as follows:

(a) Place agricultural and rural development policies and programmes at the centre of national development strategies aimed at poverty reduction and food security enhancement;

(b) Create opportunities beyond the farm and across the agricultural value chain, including all relevant actors that work within sustainable food systems;

¹⁷ See: www.ifad.org/web/knowledge/publication/asset/40253342.

- (c) Provide public goods and services to enable businesses to participate in the food system;
 - (d) Ensure that small-scale producers can tap into the potential provided by rapidly increasing urban food demand;
 - (e) Invest in agriculture, build resilience within societies, and strengthen the conservation and management of terrestrial and freshwater ecosystems to reduce human suffering, decrease humanitarian needs and costs and allow for a more targeted allocation of limited resources and secure development gains ahead of future shocks;
 - (f) Leverage the untapped potential of food systems through agro-industrial development focused on the employment of women and youth to boost productivity and incomes on small-scale farms and create off-farm employment through the development of up- and downstream agriculture services and food value chain development to help accelerate rural poverty reduction and contribute to addressing urban poverty and food insecurity;
 - (g) Support institutional and policy measures and incentives for the mobilization of responsible investments in agriculture and food systems;
 - (h) Provide smallholder family farmers with secure access to land and other productive resources and services, including water and credit;
 - (i) Prioritize coordination with high-level policy approaches to advance policy mechanisms such as the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security and inclusive models of public-private-producer partnerships;
 - (j) Apply a nutritional lens to the design and implementation of investments in agriculture, food systems and rural development, which can optimize contributions to improving nutrition.
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