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Promotion and protection of human rights: human rights questions, including alternative approaches for improving the effective enjoyment of human rights and fundamental freedoms

Human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment

Note by the Secretary-General

The Secretary-General has the honour to transmit to the General Assembly the report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, David R. Boyd, in accordance with Human Rights Council resolution [46/7](#).

* [A/76/150](#).



Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, David R. Boyd

Healthy and sustainable food: reducing the environmental impacts of food systems on human rights

Summary

In the present report, the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, David R. Boyd, identifies healthy and sustainable food as one of the substantive elements of the right to a safe, clean, healthy and sustainable environment. He describes the catastrophic environmental and health consequences of industrial food systems, unhealthy diets and food waste and the associated consequences for the enjoyment of human rights, with disproportionate adverse effects on vulnerable and marginalized groups. He highlights procedural and substantive State obligations related to ensuring healthy and sustainable food, as well as the responsibilities of businesses. He identifies good practices that reduce greenhouse gas emissions and enhance carbon sinks, improve air and water quality, reduce water use, restore soil health, protect and revitalize biodiversity, decrease the use of pesticides, fertilizers and antibiotics and reduce the risk of zoonotic diseases. He emphasizes transformative actions that will concurrently contribute to progress on multiple Sustainable Development Goals, resulting in healthy, equitable and sustainable food systems.

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I. Vital importance of food

1. Food is essential for life, but today's food systems are major drivers of the climate emergency, biodiversity crisis, pervasive pollution, soil degradation, water depletion and the rising risk of infectious diseases that spill over into humans from wildlife and livestock. Four planetary boundaries (climate change, biodiversity loss, land-system change and the global nitrogen cycle), are already being exceeded, largely owing to agriculture, sabotaging the Earth's capacity to support humanity.¹ These catastrophic environmental impacts contribute to human rights violations and exacerbate inequalities. Transforming food systems to be healthy, just and sustainable is among the most important pathways to addressing the global environmental crisis.

2. The evolution of our species and our cultures was shaped by food. When we feed our children, food is love. When we share food with families, friends and neighbours, food is community. When we eat special foods to celebrate life's milestones and accomplishments, food is joy.

3. Food also plays a vital economic role, supporting the livelihoods of more than 2 billion people and representing roughly 10 per cent of the global economy, rising to more than half of gross domestic product (GDP) in some low-income countries.²

4. Enough food is produced annually to provide adequate nutrition for everyone, but a large portion is fed to livestock, wasted or used to manufacture non-food products such as biofuels. Some 2 billion people lack adequate access to safe, nutritious and sufficient food, including 720–811 million suffering from daily hunger.³ The coronavirus disease (COVID-19) pandemic increased the number of hungry people by approximately 130 million.⁴ Paradoxically, more than 2 billion people are overweight or obese.⁵ Unhealthy diets are estimated to be the most significant risk factor for the global burden of disease.⁶

5. A painful truth is that industrially produced food appears to be cheap but is expensive. The hidden costs of hunger, unhealthy diets and unsustainable food production are a staggering \$12 trillion–\$20 trillion annually.⁷ The problems with today's food systems have deep roots. Power imbalances, rooted in economic inequality, racism, patriarchy, neocolonialism and neoliberalism impede progress towards fulfilling the right to food and the right to a healthy and sustainable environment. There is a global trend in land ownership towards fewer, larger farms, contributing to the decline of rural communities. Large monoculture plantations have displaced traditional foods, knowledge and culture. A handful of huge corporations dominate trade in seeds, pesticides, fertilizers and farm machinery, wielding their

¹ See W. Steffen and others, "Planetary boundaries: guiding human development on a changing planet", *Science*, vol. 347, No. 6223, 1259855 (February 2015).

² See World Bank, 2020, "Agriculture, forestry, and fishing, value added (% of GDP)".

³ See Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children's Fund (UNICEF), World Food Programme (WFP) and World Health Organization (WHO), *The State of Food Security and Nutrition in the World 2021: Transforming Food Systems for Food Security, Improved Nutrition and Affordable Healthy Diets for All* (Rome, 2021).

⁴ See United Nations, *The Impact of COVID-19 on Food Security and Nutrition* (June 2020).

⁵ See World Health Organization (WHO), "Obesity and Overweight".

⁶ See A. Afshin and others, "Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017", *The Lancet*, vol. 393, No. 10184, pp. 1958–1972 (April 2019).

⁷ See Food and Land Use Coalition, *Growing Better: Ten Critical Transitions to Transform Food and Land Use*, *The Global Consultation Report of the Food and Land Use Coalition* (September 2019); Scientific Group of the United Nations Food Systems Summit, *The True Cost and True Price of Food*, draft paper for the United Nations Food Systems Summit 2021 (June 2021).

power to block public policies that support just, healthy and sustainable food systems.⁸ Trade rules harm low-income States and farmers. Millions of food industry workers are unconscionably exploited, including migrant farm labourers, slaughterhouse employees and workers on plantations and factory trawlers enduring slave-like conditions.⁹ Perversely, the very people whose livelihoods depend on agriculture and fisheries are among the most likely to experience hunger. Of the 740 million people living in extreme poverty, two thirds are agricultural workers and their families.¹⁰ Diets in high-income countries include excessive animal protein and ultra-processed foods, contributing to deforestation and land-grabbing in the global South. Hundreds of billions of dollars in subsidies encourage unsustainable food production practices and predominantly benefit large rather than small producers, exacerbating inequality.

6. By mid-century, the human population could approach 10 billion, leading scientists to call for transformative changes to food systems, from production practices to diets, to attain just, healthy and sustainable outcomes.¹¹ For example, the International Assessment of Agricultural Knowledge, Science and Technology for Development stated that “the way the world grows its food will have to change radically to better serve the poor and hungry if the world is to cope with a growing population and climate change while avoiding social breakdown and environmental collapse”.¹²

7. Not all food systems contribute equally to environmental degradation and human rights violations. There is a vast diversity of production practices and an even wider range of diets. The use of water, pesticides, synthetic fertilizers, antibiotics and other inputs, as well as associated levels of pollution and environmental damage, varies extensively by type of food and production method. Meat and dairy generally use the most land and have the largest environmental impacts per calorie produced.

8. Transforming food systems is critical to fulfilling human rights and achieving multiple Sustainable Development Goals related to poverty, hunger, inequality, health, water, good work, sustainable production and consumption, climate action and biodiversity. The five targets for Goal 2 include ending hunger by 2030, doubling the incomes and productivity of small-scale producers, improving nutrition, producing food sustainably and preserving biodiversity and associated traditional knowledge.

9. The Special Rapporteurs on the right to food have done an outstanding job of addressing the multifaceted challenges that impede the full enjoyment of this right by all people.¹³ The present report, prepared with input from past and present Special Rapporteurs on the right to food, focuses on the human rights implications and obligations related to the catastrophic environmental consequences caused by today’s food systems, particularly the industrial food system, represented by practices such

⁸ See Jennifer Clapp, “The problem with growing corporate concentration and power in the global food system”, *Nature Food*, vol. 2 (2021).

⁹ See International Labour Organization (ILO), *Global Estimates of Modern Slavery* (2017).

¹⁰ See Food and Land Use Coalition, *Growing Better: Ten Critical Transitions to Transform Food and Land Use* (September 2019).

¹¹ See C. Mbow and others, “Food security”, in Intergovernmental Panel on Climate Change, *Special Report on Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* (2019), chap. 5; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services* (Bonn, Germany, 2019).

¹² See International Assessment of Agricultural Knowledge, Science and Technology for Development, “Agriculture – the need for change”, press release, 15 April 2008. Available at http://www.db.zsintern.de/uploads/1523810120-Global_Press_Release_final.pdf.

¹³ See www.ohchr.org/EN/Issues/Food/Pages/FoodIndex.aspx.

as input-heavy monocultures, intensive livestock operations and large-scale fisheries and aquaculture.

10. To prepare the present report, the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, David R. Boyd, circulated a call for inputs in January 2021. The Special Rapporteur received submissions from Argentina, Cambodia, Dominican Republic, El Salvador, Guinea, Honduras, Ireland, Italy, Kenya, Lebanon, Mexico, Nepal, the Syrian Arabic Republic, Switzerland and the European Union, as well as from youth, academics, civil society, human rights institutions and the Food and Agriculture Organization of the United Nations (FAO).¹⁴ In May 2021, the Special Rapporteur hosted an online consultation with representatives from the Committee on World Food Security, the Civil Society and Indigenous Peoples' Mechanism of the Committee on World Food Security, FAO, the International Panel of Experts on Sustainable Food Systems, the Office of the United Nations High Commissioner for Human Rights (OHCHR), Private Sector Mechanism of the Committee on World Food Security, the United Nations Environment Programme (UNEP), United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), the World Food Programme and the World Wildlife Fund. The Special Rapporteur also co-hosted a consultation with FIAN International, to hear from women from across the world working to produce food in equitable and sustainable ways.

11. The present report on healthy and sustainable food is the fifth in a series of thematic reports addressing the substantive elements of the right to a safe, clean, healthy and sustainable environment, including clean air ([A/HRC/40/55](#)), a safe climate ([A/74/161](#)), healthy ecosystems and biodiversity ([A/75/161](#)) and safe and sufficient water ([A/HRC/46/28](#)). The present report is also timed to provide input into the United Nations Food Systems Summit. The final report in the series will address non-toxic environments in which people live, work, study and play.

II. Massive environmental impacts of food systems

12. Today's food systems are trapped in a vicious cycle, threatened by the global environmental crisis and at the same time exacerbating this crisis by emitting greenhouse gases and destroying carbon sinks; polluting air and water; degrading soil; using excessive water; contributing to the collapse of biological diversity; and fuelling pandemic risks from zoonotic diseases.

13. Agriculture uses half of the planet's habitable land.¹⁵ While livestock accounts for close to 80 per cent of agricultural land-use globally, including pastures, rangelands and land used to grow feed crops, livestock provide only 18 per cent of the world's calories.¹⁶

14. Food systems are responsible for 21–37 per cent of global greenhouse gas emissions.¹⁷ Thirty-nine per cent of food-related emissions come from production (fertilizer use, manure management, methane from cattle and rice paddies, fuel for fishing boats and farm machinery, energy for fertilizer production and burning agricultural waste); 32 per cent from land-use change, especially deforestation; 18 per

¹⁴ Submissions available at:

www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/HealthySustainableFood.aspx.

¹⁵ See Navin Ramankutty and others, "Trends in global agricultural land use: implications for environmental health and food security", *Annual Review of Plant Biology*, vol. 69 (2018), pp. 789–815.

¹⁶ See <https://ourworldindata.org/agricultural-land-by-global-diets>.

¹⁷ See C. Mbow and others, "Food security", in *Special Report on Climate Change and Land* (see footnote 11).

cent from the supply chain (processing, transportation, packaging and retail); and 11 per cent from cooking and waste.¹⁸

15. Agriculture accounts for roughly 70 per cent of freshwater use globally, dwarfing all other human uses.¹⁹ Nearly one third of this is used for raising livestock.²⁰

16. Pesticides, synthetic fertilizers and animal wastes pollute water. Close to 80 per cent of the water pollution that causes eutrophication is due to agricultural runoff.²¹ Approximately 700 dead zones are caused by eutrophication, with large impacts in the Gulf of Mexico, the Baltic Sea, the North Sea, the Bay of Bengal, the South China Sea and the East China Sea.²² The health and environmental costs of agriculture-related water pollution are hundreds of billions of dollars annually.²³ In high-income States and large emerging economies, fertilizers are overused, but in low-income States, low fertilizer use suppresses yield growth and contributes to hunger and malnutrition.

17. Agriculture is responsible for surprisingly large contributions to air pollution, the largest environmental risk factor for premature death.²⁴ Over 90 per cent of global ammonia emissions come from agriculture, constituting a major source of fine particulate matter (PM_{2.5}), with significant health impacts.²⁵ Livestock production and burning crop residues are important sources of emissions.

18. Soil is the foundation of 99 per cent of the food we eat.²⁶ Healthy soil stores water and carbon, increases biodiversity and preserves food security.²⁷ However, approximately 33 per cent of land is classified as degraded because of erosion, salinization, compaction, acidification and chemical pollution.²⁸ The large difference between soil formation rates and erosion rates from conventional agriculture means that we are essentially mining soil. Overgrazing is the number one cause of land degradation and desertification globally. Further loss of productive soils threatens food security, amplifying food-price volatility and potentially plunging millions of people into hunger and poverty.

19. More than 1 billion people depend on livestock for their livelihoods. Raising livestock can have adverse environmental impacts or positive impacts, depending on ecological contexts and production practices. Pastoralists whose animals graze on

¹⁸ See M. Crippa and others, “Food systems are responsible for a third of global anthropogenic greenhouse gas emissions”, *Nature Food*, vol. 2 (2021), pp. 198–209.

¹⁹ See United Nations, *Sustainable Development Goal 6, Synthesis Report on Water and Sanitation* (2018).

²⁰ See A.Y. Hoekstra and M.M. Mekonnen, “The water footprint of humanity”, *Proceedings of the National Academy of Sciences of the United States of America*, vol. 109, No. 9 (2012), pp. 3232–3237.

²¹ See J. Poore and T. Nemecek, “Reducing food’s environmental impacts through producers and consumers,” *Science*, vol. 360, No. 6392 (2018), pp. 987–992.

²² See United Nations, *The Second World Ocean Assessment: World Ocean Assessment II*, Vol. I (New York, 2021).

²³ See FAO, *More People, More Food, Worse Water? A Global Review of Water Pollution from Agriculture* (Rome, 2018).

²⁴ See Nina G.G. Domingo and others, 2021, “Air quality-related health damages of food”, *Proceedings of the National Academy of Sciences of the United States of America*, vol. 118, No. 20 (May 2021).

²⁵ See Despina Giannadaki and others, 2018, “Estimating health and economic benefits of reductions in air pollution from agriculture”, *Science of the Total Environment*, vols. 622–623 (May 2018), pp. 1304–1316.

²⁶ See www.fao.org/soils-portal/soil-biodiversity/soil-conservation-and-agriculture/en/.

²⁷ See Rattan Lal, “The Rights of Soil”, *Journal of Soil and Water Conservation*, vol. 74, No. 4 (2019), pp. 81A–86A.

²⁸ See FAO and Intergovernmental Technical Panel on Soils, *Status of the World’s Soil Resources: Main Report* (Rome, 2015).

lands unsuitable for growing crops are less impactful, while intensive livestock operations cause the largest environmental impacts. If cattle were their own nation, they would be the world's third-largest emitter of greenhouse gases. States with very high per capita meat consumption include the United States of America, Australia, Argentina, New Zealand, Spain, Brazil, Israel and Portugal. In many low-income States, increased consumption of animal products could improve dietary quality and health outcomes.

20. In Latin America, Africa and South-East Asia, the majority of tropical deforestation results from expanding agricultural land to produce commodities such as beef, soy and palm oil. Deforestation is responsible for 30 per cent of the zoonotic diseases that pose threats of pandemics.²⁹ Bushmeat, wildlife trade and intensified livestock production are also risk factors for zoonotic disease outbreaks.

21. The leading cause of biodiversity loss is agriculture. Agriculture and aquaculture are listed as major threats for 85 per cent of the species identified as threatened with extinction on the International Union for Conservation of Nature Red List.³⁰ Livestock today are so numerous that in total they outweigh all wild mammals on Earth by a 15-to-1 ratio.³¹

22. The wide diversity of traditional seeds and breeds is of paramount importance to small-scale farmers, peasants and Indigenous peoples, but is under threat. The industrial food system encourages the dominance of large monocultures that decrease agricultural biodiversity, reduce the resilience of food systems and jeopardize food security. While more than 6,000 plant species are cultivated for food, three crops – rice, wheat and maize – account for 60 per cent of all human calories.³²

23. Industrial agriculture contaminates air, water, soil and the food chain with toxic substances – pesticides, herbicides, synthetic fertilizers and drugs – harming human and ecosystem health.³³ Indiscriminate use of pesticides decimated populations of bald eagles and peregrine falcons. Pesticide use is implicated in disturbing declines in populations of insects and insectivorous birds. Using diclofenac to treat livestock in India devastated vulture populations, as vultures were poisoned by eating carcasses of animals treated with the drug.

24. Fisheries are overexploited, heavily subsidized and plagued by illegal, unreported and unregulated catches. One third of fish populations are overfished while 60 per cent are being fished at capacity. The global biomass of large predatory fish targeted by fisheries has fallen by two thirds over the past century.³⁴ One third of freshwater fish are threatened with extinction owing to overexploitation, pollution and habitat destruction. Fishing has dire consequences for species caught incidentally or harmed by abandoned fishing gear, including sea turtles, sharks and whales. Over half of high seas fisheries would not be profitable without subsidies and forced labour.³⁵

²⁹ See Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Workshop on Biodiversity and Pandemics, Workshop Report* (Bonn, Germany, 2020).

³⁰ See <https://ourworldindata.org/environmental-impacts-of-food>.

³¹ See Yinon M. Bar-On and others, 2018, “The biomass distribution on Earth”, *Proceedings of the National Academy of Sciences*, vol. 115, No. 25 (May 2018), pp. 6506–6511.

³² See FAO, 2020, “FAOSTAT: Food Balance Database, Food Supply – Crops Primary Equivalent”.

³³ See A/HRC/34/48.

³⁴ See Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services* (see footnote 11).

³⁵ See Enric Sala and others, “The economics of fishing the high seas”, *Science Advances* vol. 4, No. 6 (June 2018), eaat2504.

25. Aquaculture now produces more seafood than wild fisheries.³⁶ Environmental concerns about aquaculture include habitat destruction (e.g., mangroves); the use of harmful chemicals and veterinary drugs; the impact of escapees, parasites and diseases on wild fish; and unsustainable use of wild fish to feed farmed fish.

26. Industrial food systems rely heavily on plastic packaging. Inadequate waste management systems cause plastic to enter air, water and soil, where it breaks down into microparticles that harm wildlife, affect plant growth and ultimately contaminate food.³⁷ Gear abandoned by industrial fishing fleets is a major source of marine plastic pollution.

27. The foregoing environmental problems are exacerbated by food loss and waste. An estimated 30 per cent of all food produced is never eaten, wasting an enormous amount of resources and creating unnecessary environmental impacts.³⁸ In low-income States, losses occur early in the supply chain owing to inadequate storage, processing and transportation infrastructure. In high-income States, extensive waste occurs at the retail and consumer stages.

28. The negative environmental impacts of food systems are growing, driven by increasing wealth, population growth and the dominance of industrial agriculture. For example, synthetic fertilizer use has increased more than 800 per cent since 1960.³⁹ Meat production is five times higher than it was in 1961, with more than 70 billion animals slaughtered annually.⁴⁰

III. Impacts of unsustainable food systems on human rights

29. The environmental impacts caused primarily by industrial food systems interfere with the enjoyment of a wide range of human rights, including the rights to life, health, water, food, a healthy environment, development, an adequate standard of living, cultural rights, the rights of the child and Indigenous rights.

A. Right to life

30. Industrial food systems and unhealthy diets undermine the right to life. Increasing consumption of highly processed, nutrient-poor foods contributes to many non-communicable diseases, which are shortening human lifespans and cause 70 per cent of all deaths worldwide.⁴¹ Unhealthy diets cause 10 million deaths annually.⁴²

31. The World Health Organization (WHO) identified antimicrobial resistance as a major international health problem. Antimicrobial medicines play a key role in treating many diseases and infections (e.g., pneumonia, tuberculosis and salmonellosis). The misuse and overuse of antimicrobials in the livestock and aquaculture industries, accounting for 70 per cent–80 per cent of total consumption, is causing the emergence and spread of antimicrobial resistance, making these drugs

³⁶ See FAO, *The State of World Fisheries and Aquaculture 2020: Sustainability in Action* (Rome, 2020).

³⁷ See Dan Zhang, and others, “Plastic pollution in croplands threatens long-term food security”, *Global Change Biology*, vol. 26, No. 3356–3367 (April 2020).

³⁸ See UNEP, *Global Environment Outlook 6: Healthy Planet, Healthy People* (Cambridge University Press, Cambridge, United Kingdom, 2019).

³⁹ See <https://ourworldindata.org/environmental-impacts-of-food>.

⁴⁰ Ibid.

⁴¹ See A/71/282.

⁴² See Afshin, “Health effects of dietary risks in 195 countries, 1990–2017” (see footnote 6).

less effective in treating humans.⁴³ Antibiotics are widely used to stimulate faster growth and to treat entire herds/flocks rather than treating individual animals that are sick. Today, 700,000 premature deaths annually involve antimicrobial resistance, a figure that could jump to 10 million annually by 2050 unless key actions are taken now.⁴⁴

32. The Committee on Economic, Social and Cultural Rights stated that food should be “free from adverse substances.”⁴⁵ Unfortunately, food can be a source of exposure to harmful bacteria, viruses, heavy metals, pesticides, growth hormones, microplastics and dioxins. WHO estimates that foodborne hazards cause 420,000 premature deaths annually, disproportionately affecting children under 5 (125,000 deaths) and people living in poverty.⁴⁶

33. Emissions of ammonia from agriculture contribute to deadly fine particulate air pollution, causing, for example, 17,900 premature deaths annually in the United States.⁴⁷ Reducing these emissions by 50 per cent globally would save hundreds of thousands of lives per year.⁴⁸

34. Agricultural pesticides cause both intentional and unintentional poisonings. Millions of suicide deaths since 1960 – mainly low-income farmers plagued by poverty, lack of access to land and other problems – have involved highly hazardous pesticides.⁴⁹ Current estimates of suicides committed using pesticides range from 110,000 to 168,000 annually. The number of premature deaths caused by unintentional acute pesticide poisoning was estimated as 11,000 annually.⁵⁰

35. In a recent landmark decision, the Human Rights Committee determined that a State’s failure to properly regulate pesticide use, implement regulations and monitor the impacts of pesticides violated the right to life. The Committee concluded that pesticide spraying “poses a reasonably foreseeable threat to the authors’ lives given that such large-scale fumigation has contaminated the rivers in which the authors fish, the well water they drink and the fruit trees, crops and farm animals that are their source of food.”⁵¹

B. Right to health

36. People’s health depends on access to safe, affordable food of adequate quantity and quality. Industrially produced foods often fail to meet these criteria, with the production and marketing of excessive amounts of meat, dairy and heavily processed

⁴³ See Thomas P. Van Boeckel and others, “Reducing antimicrobial use in food animals”, *Science*, vol. 357, No. 6358 (September 2017), pp. 1350–1352.

⁴⁴ See Interagency Coordination Group on Antimicrobial Resistance, *No Time to Wait: Securing the Future from Drug-Resistant Infections, report to the Secretary-General of the United Nations* (April 2019).

⁴⁵ E/C.12/1999/5, para. 10.

⁴⁶ See WHO, *WHO Estimates of the Global Burden of Foodborne Diseases* (2015).

⁴⁷ See Domingo and others, “Air quality-related health damages of food” (see footnote 24).

⁴⁸ Giannadaki and others, “Estimating health and economic benefits of reductions in air pollution from agriculture”.

⁴⁹ See E. Jørs, Dinesh Neupane and Leslie London, “Pesticide poisonings in low- and middle-income countries”, *Environmental Health Insights*, vol. 12, Nos. 1–3 (2018).

⁵⁰ See Wolfgang Boedeker and others, “The global distribution of acute unintentional pesticide poisoning: estimations based on a systematic review”, *BMC Public Health* vol. 20, No. 1 (2020), art. No. 1875 (2020).

⁵¹ *Portillo Cáceres v. Paraguay*, 2019 (CCPR/C/126/D/2751/2016), para. 7.5.

foods and the under-production of whole grains, legumes, fresh fruits and vegetables.⁵²

37. WHO estimates that foodborne hazards cause 600 million cases of illness annually.⁵³ The Committee on Economic, Social and Cultural Rights expressed concerns about waterborne diseases caused by agricultural pollution.⁵⁴ Water-related vector-borne diseases including malaria, schistosomiasis and Japanese encephalitis are also influenced by agricultural practices.

38. Pesticides used in agriculture have contributed to increased yields but are linked to cancer, stroke, congenital anomalies, adverse impacts on children's neurological development and neurodegenerative diseases including Parkinson's.⁵⁵ Non-lethal pesticide poisonings range from 30 million⁵⁶ to 385 million cases annually.⁵⁷ The Committee on Economic, Social and Cultural Rights expressed concerns about the serious health effects suffered by farming communities because of excessive agrochemical use and recommended that States ban all agrochemicals that adversely affect human and environmental health.⁵⁸

39. Unsafe use of wastewater and sludge in agriculture causes foodborne and waterborne diseases. For example, water pollution caused by excessive fertilizer use creates favourable conditions for the growth of cyanobacteria, which can produce toxins. Humans exposed to cyanobacteria through drinking water and recreational activities may experience symptoms including stomach cramps, vomiting, diarrhoea, fever, sore throat, muscle and joint pain, headache and liver damage.⁵⁹

40. Widespread fraud, such as mislabelling meat and fish products, also threatens the right to health. Studies indicate that 30 per cent of fish sold in restaurants and grocery stores are a different species from that advertised.⁶⁰ In Europe, horsemeat has been found in food products labelled as containing beef.

C. Right to water

41. Safe and sufficient water is vital for realizing the right to food, particularly for poor and marginalized people engaged in subsistence or small-scale farming. However, industrial food production can threaten the right to water through privatization, water pollution and excessive use. In Chile, private water rights granted to agribusinesses to grow water-intensive avocado crops for export left local residents without adequate quantities of water.⁶¹ In India and other nations, excessive use of water by corporations making soft drinks and bottled water caused water shortages for nearby communities.

⁵² See Walter Willett and others, "Food in the Anthropocene: The EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems", *The Lancet*, vol. 393, 10170 (January 2019), pp. 447–492.

⁵³ See WHO, *WHO Estimates of the Global Burden of Foodborne Diseases*.

⁵⁴ See [E/C.12/UZB/CO/2](#).

⁵⁵ See WHO, *Preventing Disease Through Healthy Environments: a global assessment of the burden of disease from environmental risks* (2016).

⁵⁶ See Jørs, "Pesticide poisonings in low- and middle-income countries", *Environmental Health Insights* (see footnote 49).

⁵⁷ See Boedeker and others, "The global distribution of acute unintentional pesticide poisoning".

⁵⁸ See [E/C.12/LKA/CO5](#).

⁵⁹ See WHO, *Toxic Cyanobacteria in Water: A Guide to their Public Health Consequences, Monitoring and Management*, chap. 3 (London, E and FN Spon, 1999). Available at https://www.who.int/water_sanitation_health/resourcesquality/toxcyanbegin.pdf.

⁶⁰ See Miguel Ángel Pardo and others, "Misdescription incidents in seafood sector", *Food Control*, vol. 62, pp. 277–283 (April 2016).

⁶¹ See www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=26177.

42. Some agrochemicals are toxic and persistent, meaning that they break down slowly in the environment. For example, the use of chlordane, a highly persistent pesticide, on banana plantations in Guadeloupe and Martinique decades ago continues to contaminate drinking water today.

43. The Committee on Economic, Social and Cultural Rights, the Committee on the Rights of the Child, the Special Rapporteur on the human rights to safe drinking water and sanitation and the Special Rapporteur on toxics and human rights have raised concerns regarding the adverse impacts on water quality from agrochemicals, large-scale livestock production and industrial shrimp aquaculture.⁶²

D. Right to food

44. The Human Rights Council observed that “environmental degradation, desertification and global climate change are exacerbating destitution and desperation, causing a negative impact on the realization of the right to food, in particular in developing countries”.⁶³

45. The Committee on Economic, Social and Cultural Rights is concerned about land and resource grabbing, whereby Governments sell or lease large areas of land to investors, businesses and other States. Land-grabbing displaces people, and in particular Indigenous peoples and peasants, from the lands that they depend upon for food and livelihoods.⁶⁴ The Committee is also concerned that small-scale fishers are being deprived of their livelihoods by overfishing and ocean-grabbing by powerful economic actors. For example, foreign-owned industrial fisheries are undermining the livelihoods of local fishers in the Gambia, Mauritania, Morocco, the Philippines and Senegal.⁶⁵

46. In many States, policies promoting export crops have reduced land available for communities to produce their own food and caused extensive pollution. Examples include large-scale monoculture soybean, palm oil and banana plantations.⁶⁶ In Guatemala, discharge of agrochemicals and waste from plantations caused major fish kills.⁶⁷ While these industries pose “a serious threat to the right to food of farmers, fishers and local communities”, they also provide a livelihood for millions of people.⁶⁸

47. Some agrochemicals bioaccumulate, threatening the health of species at the top of the food chain, including humans. For example, Indigenous peoples living in the far north are exposed to toxic pesticides because of their consumption of marine mammals containing elevated concentrations of these chemicals.

⁶² See E/C.12/URY/CO/5, A/HRC/33/49/Add.1, A/HRC/37/61/Add.1, A/HRC/39/48/Add.1 and A/HRC/40/56/Add.1.

⁶³ See Human Rights Council resolution 7/14.

⁶⁴ See E/C.12/HND/CO/2, E/C.12/UGA/CO/1, A/HRC/41/39/Add.2 and A/HRC/41/39/ADD.2/Corr.1, A/HRC/40/56/Add.2.

⁶⁵ See E/C.12/SEN/CO/3, E/C.12/PHL/CO/5-6, A/HRC/31/51/Add.2 See also <https://www.greenpeace.org/static/planet4-africa-stateless/2021/05/47227297-feeding-a-monster-enfinal-small.pdf>.

⁶⁶ See E/C.12/PRY/CO/4.

⁶⁷ See www.ohchr.org/Documents/Issues/Environment/SREnvironment/food-systems/CSOs/Plataforma-Internacional-contrala-Impunidad.docx (in Spanish).

⁶⁸ See A/HRC/40/56/Add.2.

E. Right to a safe, clean, healthy and sustainable environment

48. The right to a safe, clean, healthy and sustainable environment is legally protected by more than 80 per cent of States (156 out of 193 United Nations members) through regional treaties, constitutions and legislation.⁶⁹ Healthy and sustainable food is one of the six substantive elements of the right to a healthy environment, as recognized by regional tribunals, national human rights institutions, laws and jurisprudence.

49. In 2020, the Inter-American Court of Human Rights ruled that Indigenous peoples' right to a healthy environment had been violated by the unregulated activities of settlers – raising cattle and installing fencing – that “had an impact on the traditional ways of obtaining food of the Indigenous communities”.⁷⁰ The State was aware of the harmful activities but failed to halt them. The Court ordered Argentina to formalize the title of the Indigenous peoples to their land as promptly as possible, remove the livestock and fences and facilitate access to nutritional and culturally acceptable food.

50. National human rights institutions play a vital role in addressing environmental and human rights impacts from food systems. The national human rights institution in Malawi addressed a case where effluent from a food processing facility affected the rights of local residents. The national human rights institution in Malaysia investigated the impacts of land-grabbing for palm oil plantations on the rights of Indigenous people. The Costa Rica Ombudsperson investigated the use of dibromochloropropane on banana plantations, concluding that the pesticide sterilized male farmworkers. The Hungary Ombudsperson successfully argued before the Constitutional Court that allowing unregulated groundwater use for agriculture violated the right to a healthy environment. The national human rights institution in Thailand investigated allegations that a Thai company operating a sugar cane plantation in Cambodia was involved in forced evictions and the killing of livestock, violating human rights.⁷¹

51. Court decisions from every region have determined that unsustainable food production practices violate the right to a healthy environment. In 2017, the Supreme Court of Mexico concluded that the Government had “not taken all possible measures, to the maximum of available resources, to prevent and control processes of water degradation, to monitor that wastewater discharges comply with current regulations in quantity and quality, nor to carry out the necessary corrective actions to clean up the water” and warned that “it is indispensable that the State monitor compliance with environmental norms and, if necessary, sanction or limit the actions of private individuals; otherwise, the human right to a healthy environment would be void of content”.⁷² In 2021, the same Court upheld an injunction against a 49,000-head hog facility in Yucatán, because the facility would violate the right to a healthy environment.⁷³ In Chile, the Government's decision to allow aquaculture companies to dump 9 million kilograms of dead salmon into the ocean led the Supreme Court to conclude that the right to a healthy environment had been violated.⁷⁴ The highest court in Costa Rica ruled that the destructive impacts of bottom trawl fishing on the ocean

⁶⁹ See [A/HRC/43/53](#), annex II.

⁷⁰ See Inter-American Commission on Human Rights, *Indigenous Communities of the Lhaka Honhat Association v. Argentina*, 6 February 2020.

⁷¹ Cases in paragraph 50: see C. Ituarte-Lima and others, 2021, “National human rights institutions' catalyzing action for the realization of the right to a healthy environment” (in preparation).

⁷² See Amparo in review, 641/2017, Supreme Court, 18 October 2017. See also Amparo in review 241/20151, Supreme Court, 4 November 2015.

⁷³ See Appeal for Review, 6/2020, Supreme Court, 19 May 2021.

⁷⁴ Supreme Court of Chile, 22 May 2018.

violate the right to a healthy environment.⁷⁵ The Superior Court of Justice of Brazil ruled that severe air pollution from burning sugar cane waste violates the right to a healthy environment.⁷⁶

52. A court in Canada found a violation of the right to a healthy environment in a case involving foul odours from a composting facility that processed slaughterhouse sludge.⁷⁷

53. The Council of State in Greece ruled that diverting the Acheloos River into a different watershed to provide water for irrigation violated Greek laws, including the right to a healthy environment.⁷⁸

54. In Uganda, a court struck down a sugar cane licence that was issued in a protected forest reserve because it violated the right to a healthy environment.⁷⁹

55. In 2008, the Supreme Court of the Philippines ruled that environmental degradation in Manila Bay violated the right to a healthy environment and ordered 13 government agencies to take remedial action. The Department of Agriculture was instructed to stop illegal fishing and restore marine biodiversity.⁸⁰ In another case, regulations that restricted destructive fishing practices were upheld on the basis of the right to a healthy environment.⁸¹ In India, courts have prohibited further development of shrimp aquaculture based on environmental and human rights concerns.⁸² In Indonesia, the Ministry of Environment and Forests relied on the right to a healthy environment in a successful lawsuit against a palm oil plantation that illegally burned peatlands, resulting in \$25 million in fines and restoration.⁸³

56. Cases involving large palm oil monocultures and the rights of Indigenous peoples, highly hazardous pesticides, water pollution and land-grabbing have been brought to national contact points, using the non-judicial mechanism established under the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises.⁸⁴

F. Rights of children

57. The Convention on the Rights of the Child requires “the provision of adequate nutritious foods and clean drinking water, taking into consideration the dangers and risks of environmental pollution”.⁸⁵ Unfortunately, in 2019, 149 million children under 5 years of age were stunted, 45 million wasted and 39 million overweight, while

⁷⁵ See Constitutional Chamber of the Supreme Court, resolution No. 13101/2013, 2 October 2013.

⁷⁶ See Special Appeal No 1.094.873 — SP (2008/0215494-3), 4 August 2009, Judge Humberto Martins.

⁷⁷ See *St-Luc-de-Vincennes (Municipalité de) c. Compostage Mauricie inc.*, 2008 QCCA 235 (CanLII).

⁷⁸ See Council of State decisions, including 2759-2760/1994, 3478/2000, 3054/2009 and 26/2014.

⁷⁹ See *Advocates Coalition for Development and Environment v. Attorney General* (2004), High Court. Miscellaneous Cause No. 0100 of 2004.

⁸⁰ See *Metropolitan Manila Development Authority and others* (2008), Nos. 171947-48, Supreme Court.

⁸¹ See *Alfredo Tano and others v. Hon. Gov. Salvador P. Socrates and others* (1997) PHSC 1472, Supreme Court of the Philippines.

⁸² See *S. Jagannath v. Union of India* (1997) 2 SCC 87.

⁸³ See *Ministry of Environment and Forestry v. PT Kallista Alam*, Supreme Court, 651/K/Pdt/2015, 28 August 2015.

⁸⁴ See, for example, *Public Eye et al v. Syngenta AG*, 17 September 2020, OECD national contact point, Switzerland.

⁸⁵ Convention on the Rights of the Child, art. 24 (2) (c).

at least 340 million children suffered from micronutrient deficiencies.⁸⁶ Despite studies showing breast milk may be contaminated by environmental pollutants, it remains the best choice for infant health.

58. The Committee on the Rights of the Child has warned States about the dangers to children's health posed by water pollution, specifically agrochemicals.⁸⁷ Children often undertake agricultural labour, risking exposure to pesticides. Young children playing may be exposed to pesticides and contaminated soil, jeopardizing their neurological development. Early exposure of children to nitrates in water contaminated by agricultural fertilizer run-off can stunt their growth and affect brain development. The Committee urged States to strengthen the implementation of laws and other measures to ensure that the negative impact of "agrochemicals on underlying determinants of health, such as food, safe drinking water and sanitation, is minimized and that the entities responsible are held accountable and victims afforded effective remedies".⁸⁸ The Committee also suggested that States reduce the use of agrochemicals, ban the use of pesticides prohibited in other States, strictly regulate aerial spraying, carry out comprehensive assessments of the health effects of air, water and soil pollution and increase monitoring of pollution and pesticide residues.⁸⁹

59. It is important to acknowledge and amplify children's voices. Among the comments submitted for the present report:

"We should create vertical farms around the world to make plant-based food accessible to everyone"

"Preserve the Amazon and limit the deforestation caused by agriculture"

"Reduce animal agriculture to make way for more sustainable farming practices"

"Eat less meat, eat local, seasonal and organic food"

"Make people more aware about how much food they waste"

"Mandatory use of organic food in schools"

"Make laws against plastic that is not needed in packaging and make it compulsory to use sustainable packaging ... Ban plastic toys and glitter in fast food restaurants"

G. Vulnerable populations

60. In addition to children, States should give special attention to other vulnerable or marginalized groups whose rights may be jeopardized by the environmental impacts of food systems, including women, Indigenous peoples, racially and ethnically marginalized groups, refugees, migrants, persons with disabilities, lesbian, gay, bisexual and transgender persons (LGBT) persons, older persons, people living in protracted armed conflicts and people living in poverty. These groups often have fewer resources, are disproportionately impacted and have less access to health-care services, increasing the risk of illness or death.

⁸⁶ See Food and Agriculture Organization of the United Nations, *The State of Food Security and Nutrition in the World, 2021*; www.unicef.org/nutrition.

⁸⁷ See [CRC/C/PHL/CO/3-4](#), [CRC/C/BRA/CO/2-4](#), [CRC/C/ISR/CO/2-4](#), [CRC/C/PRK/CO/4](#), [CRC/C/GEO/CO/3](#).

⁸⁸ See [CRC/C/ARG/CO/5-6](#).

⁸⁹ See [CRC/C/BRA/CO/2-4](#).

61. A critical issue is lack of access to land.⁹⁰ A lack of formal land and tenure rights jeopardizes the right to food for millions of Indigenous peoples, peasants, Afro-descendants, women and the poor. The Committee on Economic, Social and Cultural Rights is concerned that the expansion of industrial agriculture, particularly monocultures, has restricted Indigenous peoples' access to land on which to grow, gather and hunt their own food.⁹¹ Palm oil, rubber and soy plantations have been identified as problematic for human rights and the environment in Brazil, Colombia, Ecuador, Indonesia, Liberia, Malaysia, Paraguay and other States.⁹² The Committee on the Elimination of Racial Discrimination expressed concern over the significant obstacles Indigenous and Afro-descendant communities face in exercising their rights to land, including violence against their leaders and forced displacement.⁹³ The Special Rapporteur on minority issues observed that "specific legal and policy measures are required to protect the land rights of those who practice nomadic, transhumance and hunter-gatherer lifestyles, including their right to have access to traditional forest habitats and to use land seasonally for grazing".⁹⁴

62. Lack of access to land is exacerbated by land, water and resource grabbing, often resulting in the forced eviction, displacement or loss of access to land for Indigenous peoples, peasants and local communities. The Committee on the Rights of the Child and the Committee on the Elimination of Racial Discrimination warned that businesses contribute to land-grabbing through financing, processing or trading palm oil, soybeans and other agricultural commodities, thus violating the rights of Indigenous peoples and children.⁹⁵ Other examples include the sale of oil exploration rights to hundreds of thousands of hectares of the Amazon to foreign companies despite the objections of Indigenous peoples and the sale of valuable farmland in Africa and elsewhere to foreign corporations. It is widely understood that, for Indigenous peoples and peasants, the loss of land leads to the destruction of their traditional way of life.

63. Today's industrial agriculture system, in which a handful of large corporations control a massive and growing share of the market for seeds, fertilizers, pesticides and farm equipment, creates power imbalances that threaten all farmers, but particularly smallholders. The Committee on Economic, Social and Cultural Rights warned that "extreme poverty among small-hold farmers caused by the lack of land, access to credit and adequate rural infrastructures, has been exacerbated by the introduction of genetically modified seeds by multinational corporations and the ensuing escalation of prices of seeds, fertilizers and pesticides".⁹⁶

64. Polluting industrial food facilities, including intensive livestock operations, slaughterhouses and agrochemical manufacturing factories, are disproportionately located in poor and racially marginalized communities, resulting in severe environmental injustices and human rights violations.

65. As farmers, fishers, land managers, scientists and entrepreneurs, women are often responsible for growing, gathering, processing and preparing food. Women make up almost half of the world's agricultural workforce and in some low-income countries produce up to 80 per cent of the food, yet are often unpaid or paid less than men doing the same work. Understanding gender differences in vulnerability, roles and capacity is essential for designing fair and effective actions to ensure healthy and

⁹⁰ See CERD/C/KHM/CO/14-17, CERD/C/PRY/CO/4-6, E/C.12/PHL/CO/5-6.

⁹¹ See E/C.12/GTM/CO/3.

⁹² See E/C.12/IDN/CO/1, A/HRC/42/47/Add.2, E/C.12/PRY/CO/4.

⁹³ See CERD/C/COL/CO/14.

⁹⁴ See A/HRC/25/56/Add.1.

⁹⁵ See CRC/C/NLD/CO/4, CERD/C/NLD/CO/19-21.

⁹⁶ See E/C.12/IND/CO/5.

sustainable food. Women have less access to a range of resources, including land ownership or tenure, credit, agricultural extension services and technology. These inequalities are perpetuated because discrimination means women are often less involved in food system planning, policymaking and decision-making.

66. The Committee on the Elimination of All Forms of Discrimination Against Women expressed concerns about the disproportionate impacts on women of environmental problems caused by industrial agriculture.⁹⁷ The Committee emphasized the harmful impact of the use of pesticides, fertilizers and other agrochemicals on women's health.⁹⁸ The Special Rapporteur on the right to food warned that soil erosion, diminishing soil fertility and desertification threaten women's traditional role as food producers.⁹⁹ Indigenous women face heightened difficulties, including lack of recognition of land ownership and tenure, forced evictions from traditional lands, exclusion from decision-making processes concerning land use and the failure to secure their free, prior and informed consent regarding proposed developments in their territories.¹⁰⁰

67. Nevertheless, women can be key actors in changing the way food is grown, raised, gathered, processed and sold. Closing the agricultural gender gap can improve the lives of women, their families and communities and improve food security while reducing deforestation. It is estimated that if all women smallholders received access to productive resources equal to men, their farm yields would rise by 20 to 30 per cent, potentially ending hunger for up to 150 million people.¹⁰¹

IV. Human rights obligations related to healthy and sustainable food

A. State obligations

68. The devastating environmental effects of industrial food systems and associated unhealthy diets on the enjoyment of a wide range of human rights give rise to extensive duties of States to prevent those harms. States should apply a rights-based approach to all food-related laws, regulations, policies and actions, in order to minimize negative impacts on the environment and human rights. The rights-based approach clarifies the obligations of States and responsibilities of businesses; catalyses ambitious action; emphasizes the need for capacity-building; prioritizes the poorest and most vulnerable; and empowers people to become involved in designing and implementing solutions.

69. The Committee on Economic, Social and Cultural Rights clarified substantive obligations related to the right to food through its general comment No. 12, noting that "sustainability" requires food to be accessible for both present and future generations and requiring States to implement rights-based national food strategies and effective environmental policies.¹⁰² The Committee added that "care should be taken to ensure the most sustainable management and use of natural and other resources for food at the national, regional, local and household levels."¹⁰³

⁹⁷ See [CEDAW/C/HND/CO/7-8](#).

⁹⁸ See [CEDAW/C/GTM/CO/8-9](#), [CEDAW/C/ARG/CO/7](#).

⁹⁹ See [A/HRC/31/51/Add.2](#).

¹⁰⁰ See [CEDAW/C/ARG/CO/7](#).

¹⁰¹ See FAO, *The State of Food and Agriculture: Women in Agriculture – Closing the Gender Gap for Development* (Rome, 2011).

¹⁰² Committee on Economic and Social Rights, general comment No. 12 on the right to adequate food, paras. 7 and 8.

¹⁰³ *Ibid.*, para. 10.

70. The framework principles on human rights and the environment clarify the three categories of State obligations: procedural, substantive and special obligations towards those in vulnerable situations.¹⁰⁴ States have procedural obligations to:

- (a) Provide the public with accessible information about healthy and sustainable food, including nutritional content, the environmental footprint and dietary guidelines based on human and environmental health;
- (b) Incorporate information about healthy and sustainable food throughout the educational curriculum;
- (c) Ensure an inclusive, equitable and gender-based approach to public participation in all food system planning, policymaking, budgeting and other actions;
- (d) Enable affordable and timely access to justice and effective remedies for all;
- (e) Assess the potential environmental, social, health, cultural and human rights impacts of all plans, policies, projects and proposals related to food systems;
- (f) Integrate gender equality into all plans and actions related to food systems, increasing women's access to land, credit, inputs, information and technology and empowering women to play leadership roles at all levels;
- (g) Provide strong protection for environmental human rights defenders working on food-related issues.

71. Agribusiness is frequently implicated in the murder of human right defenders.¹⁰⁵ States must vigilantly protect defenders from intimidation, criminalization and violence, diligently investigate, prosecute and punish the perpetrators of these crimes; and address the root causes of social-environmental conflict related to food systems.¹⁰⁶

72. With respect to substantive obligations, States must not violate, through their own actions, the right to food, the right to a healthy and sustainable environment or other human rights that are jeopardized by the environmental consequences of food systems; must protect rights from being violated by third parties, in particular businesses; and must take positive actions to fulfil these rights. Failing to prevent foreseeable human rights harms caused by the environmental impacts of industrial food systems or failing to mobilize the maximum available resources in an effort to do so, could constitute a breach of States' obligations. States also must avoid discrimination and retrogressive measures. The Human Rights Committee has clarified that human rights obligations should be informed by international environmental law and vice versa.¹⁰⁷ States should integrate the right to food and the right to a healthy environment into national agriculture, aquaculture and fisheries laws, policies, strategies and programmes.

73. States have particular obligations to Indigenous peoples, local communities, Afro-descendants and peasants (including artisanal fishers) in actions related to food systems. The top priority involves legal recognition for their land titles, tenures and rights, acknowledging the existence of different customs and systems, including collective ownership and governance models. The United Nations Declaration on the Rights of Indigenous Peoples provides that "Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their

¹⁰⁴ See [A/HRC/37/59](#), annex.

¹⁰⁵ See Global Witness, *Defending Tomorrow: The Climate Crisis and Threats against Land and Environmental Defenders* (2020).

¹⁰⁶ See [A/HRC/25/55](#) and [A/71/281](#).

¹⁰⁷ Human Rights Committee, general comment No. 36 (on the right to life), para. 62.

lands or territories and resources.”¹⁰⁸ Pursuant to the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas, States must “take appropriate measures to promote and protect the traditional knowledge, innovation and practices of peasants and other people working in rural areas, including traditional agrarian, pastoral, forestry, fisheries, livestock and agroecological systems relevant to the conservation and sustainable use of biological diversity”.¹⁰⁹

74. Applying a rights-based approach to the governance of food systems requires States to make systemic changes, prioritizing action to improve the lives and livelihoods of the most disadvantaged, particularly those: who do not currently have adequate access to healthy and sustainable food; who lack access to land or whose land tenure is insecure; or whose right to a healthy and sustainable environment is being threatened or violated by food-related actions. Pursuant to international human rights law, the rights to food and a healthy, sustainable environment are subject to progressive realization, recognizing that in some low-income States they cannot be immediately fulfilled. However, States are obligated to use the maximum available resources to realize the rights to food and a healthy, sustainable environment. Some obligations, such as non-discrimination and non-regression, are of immediate effect.

75. States currently provide more than \$700 billion in annual subsidies to food production, the majority of which supports unsustainable practices and goes to large operators in industrial food systems.¹¹⁰ Agroecology, other sustainable production approaches and smallholders receive a small fraction of subsidies, research and development funding and extension services. In the United States, the top 10 per cent of agricultural subsidy recipients receive 77 per cent of available funds while 60 per cent of farms get nothing. Shifting subsidies towards sustainable practices and smallholders would provide immense social, health and environmental benefits.¹¹¹

76. The investment needed to transform food systems to become sustainable is an estimated \$300 billion–\$350 billion annually, although the societal return on investment could be up to 15 times higher.¹¹² Wealthy States must contribute more towards the costs of securing healthy and sustainable food in low-income countries. The amount of official development assistance dedicated to food security and nutrition is a paltry \$12 billion annually, but \$33 billion, if spent on effective interventions, could end hunger by 2030.¹¹³ To avoid exacerbating debt problems, food-related financial assistance to low-income countries should consist of grants, not loans.

B. Responsibilities of businesses

77. Businesses play an important role in food systems but are responsible for input-heavy monoculture plantations, intensive livestock operations, land and water-grabbing, deforestation and overfishing, thus exacerbating the global environmental crisis. Through the production and marketing of unhealthy ultra-processed foods,

¹⁰⁸ United Nations Declaration on the Rights of Indigenous Peoples, art. 29.

¹⁰⁹ United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas, art. 20.

¹¹⁰ See OECD, *Agricultural policy, monitoring and evaluation 2017* (Paris, 2017).

¹¹¹ See David Laborde and others, “Agricultural subsidies and global greenhouse gas emissions” *Nature Communications* vol. 12, art. No. 2601 (2021).

¹¹² See Food and Land Use Coalition, *Growing Better* (see footnote 10).

¹¹³ See David Laborde and others, *Ceres2030: Sustainable Solutions to End Hunger, Summary Report*, (Cornell University, International Food Policy Research Institute and International Institute for Sustainable Development, 2020).

including advertising aimed at children, businesses negatively influence dietary choices.

78. Businesses must adopt human rights policies, conduct human rights due diligence, establish transparent and effective grievance mechanisms, remedy human rights violations for which they are directly responsible and work to influence other actors to respect human rights where relationships of leverage exist. The Guiding Principles on Business and Human Rights apply to the activities, subsidiaries and supply chains of food-related businesses. These businesses should implement solutions to reduce greenhouse gas emissions, safeguard carbon sinks, reduce pollution, alleviate water scarcity, restore soil health, reduce impacts on biological diversity, reduce waste and decrease risks of pandemics from zoonotic diseases. Businesses should respect the rights of Indigenous peoples, local communities and peasants and avoid projects, products and activities that jeopardize the human rights to food and a safe, clean, healthy and sustainable environment. In addition, businesses should support laws and policies intended to reduce the environmental and health impacts imposed by industrial food systems.

V. Good practices

79. Despite the immense environmental impacts of food systems, there are hundreds of millions of farmers, fishers, pastoralists, peasants and Indigenous peoples striving to produce healthy and sustainable food in the face of daunting challenges. A handful of leading examples are profiled below, with additional good practices contained in annex I.¹¹⁴

80. Agroecological practices can reduce environmental impacts and improve livelihoods for small-scale farmers, including women, because of reduced reliance on expensive external inputs.¹¹⁵ Agroecology improves air, soil and water quality, is less energy-intensive, reduces emissions of greenhouse gases and enhances carbon sinks.¹¹⁶ Examples of successful transitions to agroecology include strawberry farming in Santa Cruz, California, sustainable coffee production in San Ramón, Nicaragua and Veracruz, Mexico, an Ecovillage in Chololo, United Republic of Tanzania, a food cooperative in Shanxi, China, organic production in the Drôme Valley, France and Vega, Andalusia, Spain, and the dramatic decline in chemical inputs used in Cuba.¹¹⁷

81. Globally Important Agricultural Heritage Systems are systems led by local communities that support cultural heritage, agricultural biodiversity and ecosystem resilience. There are more than 60 designated systems in 22 nations, including the traditional rice-fish-duck system in south-western China, the agropastoral practices of the Maasai in the United Republic of Tanzania, terraced olive groves in Italy, Indigenous Andean agriculture growing potatoes, maize and quinoa at high elevations in Peru and the oases system in Morocco.

¹¹⁴ Available at:

www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/AnnualReports.aspx.

¹¹⁵ See High Level Panel of Experts on Food Security and Nutrition, *Agroecological and other Innovative Approaches for Sustainable Agricultural and Food Systems that Enhance Food Security and Nutrition* (2019).

¹¹⁶ See A/HRC/16/49.

¹¹⁷ See International Panel of Experts on Sustainable Food Systems, *Breaking away from Industrial Food and Farming Systems: Seven case studies of agroecological transition* (2018).

82. Taxes on unhealthy ultra-processed foods (e.g., junk food, soft drinks) have been successful in reducing consumption of these products in many States, including Chile, Mexico, South Africa and the United Kingdom of Great Britain and Northern Ireland.

83. To protect the land rights of Indigenous peoples and peasants, Argentina and Brazil passed laws limiting foreign land ownership, while Cambodia and Laos imposed moratoriums on new land concessions.

84. Banning all highly hazardous pesticides significantly reduced suicides in Bangladesh and Sri Lanka, without adversely affecting agricultural yields. Bhutan is the first State to prohibit all uses of synthetic pesticides.

85. France is a leader in promoting healthy and sustainable food, with pioneering laws promoting agroecology, addressing food waste, increasing corporate accountability, prohibiting bee-killing neonicotinoid pesticides and banning the export of agrochemicals not permitted for use in France.

86. Micronesia reintroduced a traditional variety of orange-fleshed banana with 50 times more beta-carotene than the commercial white-fleshed banana, improving nutrition and health.

87. The European Union banned non-medicinal uses of antibiotics in livestock in 2006. Denmark, Finland, Norway and Sweden have demonstrated that dramatically reducing antibiotic use in livestock is compatible with a healthy, productive agricultural sector. In the Netherlands, livestock operations must meet stringent limits for ammonia emissions, reducing air pollution.

88. In Brazil, the National School Meals Programme provides healthy food for millions of children, while the Programme for the Purchase of Food from Family Agriculture is excellent example of using public procurement to support sustainable food.

VI. Conclusion and recommendations

89. FAO defines “healthy and sustainable food” as having low environmental impact, protecting biodiversity, ecosystems and the climate; contributing to food security and meeting the health and nutritional needs of current and future generations through culturally acceptable, accessible and affordable food.¹¹⁸ A rights-based approach, focused on the right to food and the right to a healthy environment, is an essential catalyst for accelerating the transformation from today’s unsustainable food systems to a future where everyone enjoys healthy and sustainable food, workers are treated fairly and degraded ecosystems are restored. This is an obligation for States, not an option.

90. Recognizing the complexity and diversity of food systems is essential when evaluating solutions. For hundreds of millions of people facing hunger and malnutrition, poverty must be alleviated and the quantity and quality of accessible food must be increased. In middle and high-income States, diets with fewer calories but more nutrients would improve health and reduce environmental impacts. Small-scale producers require support to improve their livelihoods while minimizing additional environmental impacts. Large-scale producers must be regulated or incentivized to reduce their environmental impacts. Solutions such as “eat less meat” may be appropriate in States where meat consumption is excessive, but are inappropriate in other contexts, including Indigenous peoples and pastoralists for

¹¹⁸ See FAO, *Sustainable Diets and Biodiversity: Directions and Solutions for Policy, Research and Action* (Rome, 2010).

whom livestock are key to their cultures and livelihoods or people living in poverty for whom meat could contribute to healthier diets.¹¹⁹

91. To address the environmental impacts of food systems, there are proven solutions available to reduce greenhouse gas emissions and enhance carbon sinks, reduce air and water pollution, alleviate water scarcity, decrease the use of pesticides, fertilizers and antibiotics, restore soil health, safeguard biological diversity and decrease the risks of pandemics from zoonotic diseases. Agroecology, with its 13 principles, addresses all of these problems, while also seeking to achieve economic diversification, social equity, co-creation of knowledge, connections between producers and consumers, animal health and dignified, robust livelihoods for all food system actors.¹²⁰ Progress towards sustainable food production could be achieved through various approaches, including regenerative agriculture, organic farming, conservation agriculture, permaculture, climate-smart agriculture, precision agriculture and agroforestry. Many solutions offer multiple benefits (e.g., reducing pesticide use is good for soil, biodiversity and human health).

92. Despite complexity and diversity, there are key changes that would improve the sustainability and equity of food systems globally, especially industrial food systems:

(a) Reduce greenhouse gas emissions and safeguard carbon sinks:

Many of the most powerful climate mitigation actions involve food systems, including: reduced food waste, predominantly plant-based diets, restoration of tropical and temperate forests, silvopasture, peatland protection and rewetting, reforestation on degraded land, perennial staple crops, managed grazing, agroforestry and tree inter-cropping (planting trees among diverse crops).¹²¹ Climate-smart agriculture employs crops that are more tolerant of heat, drought, salinity, pests and disease. Integrated animal and crop systems, better manure management and improved feed can reduce greenhouse gas emissions.

(b) Reduce air and water pollution:

The key steps that States must take to reduce pollution from food systems include: identifying major sources of food-related air and water pollution; ensuring that legislation, regulations, standards and policies for air and water quality apply fully to pollution from food systems; developing and implementing action plans for air and water quality at the local, national and, if necessary, regional levels; and evaluating progress, taking stronger action if needed. A priority is phasing out intensive livestock operations, which generate high levels of pollution.

(c) Alleviate water scarcity:

Legislation should ensure that the highest priorities for access to water are fulfilling human rights to water, sanitation, food, an adequate standard of living (including small-scale food production) and a healthy environment. Key agricultural actions include shifting to less water-intensive, more drought-tolerant crops, using high-efficiency irrigation systems, harvesting rainwater, maintaining vegetation and mulch cover, safely using treated wastewater and altering flood regimes for rice paddies. Ecosystem-based watershed management can reduce agricultural impacts on surface water and groundwater, minimize flood risks, increase climate resilience and protect biodiversity.

¹¹⁹ See Zia Mehrabi and others, “Livestock policy for sustainable development”, *Nature Food*, vol. 1 (2020), pp. 160–165.

¹²⁰ See High-level Panel of Experts on Food Security and Nutrition, *Agroecological and other Innovative Approaches* (2019).

¹²¹ See Project Drawdown, 2021, table of solutions. Available at <https://drawdown.org/solutions/table-of-solutions>.

(d) Decrease the use of pesticides, fertilizers and antibiotics:

The use of highly hazardous pesticides should be prohibited in all States, as this would save lives without sacrificing yields.¹²² Neonicotinoid pesticides should be banned to protect bees and other important pollinators. Regulations should be strengthened and taxes imposed on all remaining pesticides based on their toxicity, with revenues used to assist producers to reduce or eliminate pesticide use.¹²³ Support should be provided (e.g., credit, information, extension services, training programmes) to producers seeking organic, fair trade or other credible sustainability certification. In some regions (e.g., North America, Western Europe, South-East Asia), fertilizer use is often excessive and should be reduced. Adopting a closed loop system recycles nitrogen and phosphorous from places where they concentrate, such as sewage treatment plants, food processing plants, compost operations and livestock production facilities. This keeps excess nitrogen and phosphorous out of the biosphere, decreasing environmental effects. In other regions (e.g., Africa, Latin America), low fertilizer use contributes to a substantial yield gap. Regulations are needed to eliminate the use of antibiotics to promote growth in livestock and prevent prophylactic treatment of entire herds/flocks.

(e) Restore soil health:

In addition to the preceding steps, key actions to restore soil health include application of organic fertilizers, minimal or no tillage, diverse crop rotations, use of cover crops, composting, integration of crops and livestock, planting trees and restoring vegetation on degraded lands, application of biochar and improved grazing management. These techniques will increase soil biodiversity, water storage and carbon sequestration, contributing to reduced erosion and increased yields.

(f) Safeguard biological diversity:

States should enact and enforce laws to end deforestation and the conversion of forests into agricultural land, with exceptions in appropriate circumstances for small-scale subsistence farmers; encourage diversification at multiple scales (from farm to landscape) to increase both crop and non-crop biodiversity; require diversification of large monoculture plantations; and incorporate food systems into national biodiversity strategies and action plans. International agreements and national laws on genetic resources and intellectual property should be modified to respect and protect farmers' access to diverse, traditional and locally adapted seeds, foods and livestock breeds.¹²⁴ Protecting and restoring marine biodiversity will require an end to overfishing, increasing enforcement against illegal, unreported and unregulated fishing, protecting marine and coastal habitats, reducing pollution and establishing well-managed protected areas. Reviving and supporting traditional foods and ancestral practices of Indigenous peoples and peasants, including crops with high climate/disease tolerance and nutritional value, will increase resilience. Laws are needed to reduce the impacts of invasive species. Sensitive ecosystems (e.g., wetlands, peatlands, mangroves) should not be used for agriculture or aquaculture.

(g) Decrease the risks of pandemics from zoonotic diseases:

Key actions include enacting and enforcing laws to end deforestation and the conversion of forests into agricultural land; strictly regulating wildlife trade by targeting illegal, unsustainable and unhygienic practices and high-risk species while supporting sustainable trade in wildlife that fulfils the rights to food and livelihood for poor and marginalized rural populations and contributes to protecting species and

¹²² See Hanna-Andrea Rother, "Pesticide suicides: what more evidence is needed to ban highly hazardous pesticides?" *The Lancet Global Health*, vol. 9, No. 3 (March 2021), pp. e225-e226.

¹²³ [A/HRC/34/48](#), para. 107.

¹²⁴ See [A/HRC/46/33](#).

their habitat; tightening regulations for industrial agriculture, including biosecurity measures, to prevent transmission of infectious diseases from wildlife and livestock to people; and monitoring high-risk wildlife and vulnerable human populations, focusing on hotspots of emerging infectious diseases and high-risk interfaces between wildlife, livestock and humans. States should implement One Health, an integrated strategy for managing the complex interconnections between humans, animals and ecosystems to prevent zoonotic disease outbreaks.

93. Actions to tackle the climate emergency and biodiversity crisis must take the right to food into account. In the past, policies supporting biofuel production have contributed to spikes in food prices, riots and a major increase in people suffering from hunger.¹²⁵ Conservation measures, such as new parks, must take into account the right to food of Indigenous people, peasants, Afro-descendants and others dependent on the land for food, livelihoods and culture.

94. While the foregoing changes are necessary, they are not sufficient to achieve the required transformation of today's food systems. Fulfilling the rights to food and a healthy and sustainable environment requires additional policy and governance changes:

(a) Increase equity:

Supporting smallholders has the potential for a triple dividend – improving livelihoods, increasing yields and protecting biodiversity. To enhance social equity, States should:

- a. Support small-scale producers with access to land, water, seeds and other inputs, information, credit, markets and marketing facilities, appropriate technology, extension services (including agroecological field schools), value-added opportunities and affordable and effective insurance;
- b. Empower women through gender-responsive strategies to ensure equal access to all of the foregoing resources and strengthen women's participation in all levels of policymaking;
- c. Invest in vocational programmes for rural youth that offer training in food-related skills;
- d. Strengthen food producers' and consumers' cooperatives and other organizations that build capacities, create and exchange knowledge and facilitate the adoption of agroecological and other sustainable approaches;
- e. Strengthen minimum income and other social protection programmes for marginalized and vulnerable groups to ensure they can afford healthy diets;

(b) Promote healthy and sustainable diets:

Moving to predominantly plant-based diets could reduce greenhouse gas emissions, ocean acidification and eutrophication from food systems by half; free up billions of hectares of land for restoration to protect biodiversity and store carbon; and reduce water scarcity.¹²⁶ Therefore, States should:

- a. Create incentives for producing and consuming diverse, fresh, healthy, seasonal and sustainable foods, including whole grains, legumes, vegetables, fruits, nuts and seeds, as well as nutritionally rich but neglected species and varieties;

¹²⁵ See High-level Panel of Experts on Food Security and Nutrition, *Biofuels and food security* (Rome, 2013).

¹²⁶ See Willett and others, "Food in the Anthropocene", *The Lancet* (see footnote 52).

- b. Publish and promote national nutrition guidelines that integrate health and sustainability considerations;
- c. Require front-of-package warning labels for food products, based on health and sustainability criteria;
- d. Use public procurement (including school and hospital meals) to support the production and consumption of local, healthy and sustainable foods;
- e. Prohibit marketing of unhealthy foods towards children;
- f. Prohibit marketing of breast milk substitutes and ultra-processed foods intended for babies, toddlers and young children;
- g. Use taxes to reduce consumption of unhealthy and unsustainable foods, including drinks, ultra-processed products and processed meats that are high in sugar, salt or fat;

h. Provide food literacy programmes to the general population and children in particular;

(c) Reduce food loss and waste:

Reducing loss and waste could reduce food-related environmental impacts by roughly 30 per cent. States should:

- a. Increase credit, education, training, extension services and access to markets for smallholders, enabling them to improve harvest timing and techniques;
- b. Invest in better storage, cooling, processing and transport infrastructure to reduce post-harvest losses;
- c. Apply circular economy principles by supporting the reuse of animal waste, crop residues and food processing waste as animal feed, compost, biogas and mulch;
- d. Support local and regional food systems;
- e. Address food waste through policies related to general waste management, food safety, labelling and subsidies;

(d) Economic reforms

To finance the required systemic changes, States should:

- a. Redirect more than \$700 billion in food-related subsidies that undermine sustainability to support innovation, implement sustainable production practices (particularly agroecology), end overfishing, develop green technologies, create just transition strategies, support healthy diets and restore ecosystems;
- b. Fund research and development and extension services to support sustainable production practices, particularly agroecology and to increase yields of dietary staples in the global South;
- c. Implement the proposed global fund for social protection;¹²⁷
- d. Support urban, community and household food production;
- e. Create incentives for young entrepreneurs, women and community-led enterprises that capture and retain value locally

¹²⁷ See [A/HRC/47/36](#).

f. Use recent developments in digital technologies and support open data initiatives that link producers, consumers, academics and decision makers;

g. Revise trade agreements and rules to ensure that food trade is equitable and to support transitions towards sustainable food systems;

h. Use anti-trust legislation to reverse the excessive concentration in the food sector;

i. Implement reforms aimed at ensuring equitable access to land;

(e) Transforming food system governance;

States should:

a. Incorporate the right to food and the right to a healthy, sustainable environment in legislation, with mechanisms for accountability;

b. Develop national food goals and strategies, informed by the Sustainable Development Goals, to achieve sustainable food systems;

c. Enact legislation implementing the United Nations Declaration on the Rights of Indigenous Peoples, the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas and International Labour Organization Convention (No. 169) concerning Indigenous and Tribal Peoples in Independent Countries;

d. Enact legislation, based on the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, to prevent land, water and resource-grabbing;

e. Implement the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication;

f. Limit food-related businesses and their industry associations from lobbying, making political donations or otherwise influencing food, agriculture, nutrition, water, energy and environmental policies, in the light of their disproportionate contribution to the global environmental crisis;

g. Repeal laws and regulations that: exempt agricultural activities from environmental laws and standards (e.g., right-to-farm laws); prohibit criticism of agricultural activities (e.g., “ag-gag” laws, food libel laws); and permit lower wages or inadequate working conditions for persons employed in food-related jobs;

h. Legislate standards requiring businesses to conduct due diligence for human rights and the environment, both at the firm level and throughout supply chains, including access to remedies for affected rights-holders and substantial penalties for non-compliance;

i. Complete negotiations on new international treaty governing transnational corporations and human rights.

95. Feeding 8 billion people healthy, sustainable food and fulfilling the Sustainable Development Goals by 2030 are monumental challenges. However, transforming food systems that exploit millions of workers, undermine the health of billions of people and inflict trillions of dollars in environmental damages is morally and legally imperative in order to respect, protect and fulfil human rights. Achieving just, healthy and sustainable food systems will ensure that nobody is hungry or malnourished, that all producers and workers are treated fairly and that environmental impacts – climate change, biodiversity loss, water use and pollution – remain within planetary boundaries.