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 Healthy and Sustainable Food: Good Practices

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

 The following information is supplementary to the report to the General Assembly of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment (A/76/179). This Annex provides details of additional good practices related to healthy and sustainable food, one of the six substantive elements of the right to a safe, clean, healthy and sustainable environment. It is available in English only on the website of the Office of the High Commissioner for Human Rights:

<https://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/Annualreports.aspx>

Contents: *Page*

 I. Introduction 3

 II. Constitutions, Laws and Policies 3

 III Agroecology, Agroforestry, and Other Sustainable Food Production Practices 7

 IV. Reducing Water Scarcity 14

 V. Protecting and Restoring Agricultural Land and Biodiversity 16

 VI. Reducing Greenhouse Gas Emissions and Protecting Carbon Sinks 19

 VII. Reducing the Use of Pesticides, Synthetic Fertilizers and Antibiotics 22

 VIII. Reducing the Risks of Pandemics of Zoonotic Origin 19

 IX.. Reducing Greenhouse Gas Emissions and Protecting Carbon Sinks 24

 X. Reducing the Use of Pesticides, Synthetic Fertilizers and Antibiotics 24

 XI. Reducing Food Loss and Waste 26

 XII. Systemic and Transformative Changes 27

 XIII. Conclusion 29

 I. Introduction

1. Drawn from every region and featuring more than 100 States and a wide range of actors, the following examples are intended to inspire others to take ambitious action to fulfil human rights throughout all aspects of food systems. It should be noted that these examples are illustrative rather than exhaustive, meaning many more good practices are being implemented across the world. The Special Rapporteur is grateful for the detailed and helpful submissions received 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 dozens of insightful submissions from youths, academics, civil society, human rights institutions and the FAO.[[1]](#footnote-1) 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.
2. Drawn from every region and featuring more than 100 States and a wide range of actors, the following examples are intended to inspire others to take ambitious action to fulfil human rights throughout all aspects of food systems. It should be noted that these examples are illustrative rather than exhaustive, meaning many more good practices are being implemented across the world. The Special Rapporteur is grateful for the detailed and helpful submissions received 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 dozens of insightful submissions from youths, academics, civil society, human rights institutions and the FAO. 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.

 II. Constitutions, Laws and Policies

1. All States should recognize the right to food and the right to a safe, clean, healthy and sustainable environment in their constitutions and legislation. According to the FAO, the right to food is recognized in approximately 30 national constitutions (Belarus, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Democratic Republic of Congo, Dominican Republic, Ecuador, Egypt, Fiji, Guatemala, Guyana, Haiti, Honduras, Kenya, Malawi, Maldives, Mexico, Moldova, Nepal, Nicaragua, Niger, Panama, Paraguay, the Philippines, South Africa, Suriname, Ukraine and Zimbabwe).[[2]](#footnote-2) The right to a healthy and sustainable environment is recognized in more than 100 national constitutions, and recognized in law by more than 80 percent of UN member States (156 out of 193).[[3]](#footnote-3) Almost every State that includes the right to food in its constitution also includes the right to a healthy environment (with the exceptions of Haiti and Suriname).
2. The Mexican *Law for sustainable agricultural development (2012)* provides sustainability- specific investment provisions. The Law directs the state government (supplemented by funding from the federal government) to allocate resources to support producers seeking to modernize infrastructure and equipment, for sustainable energy-saving technology, and for the improvement of land for environmental services (Article 58). Financial support prioritizes producers whose activities protect soil, capture and use water efficiently, recycle inputs and protect the environment (Article 63). The financing programs are tailored to the socioeconomic structure and characteristics of the rural entities.[[4]](#footnote-4) Mexico’s Agriculture and Rural Development Sectorial Program 2020-2024(ARDSP) is intended to achieve “a fair, healthy and sustainable agricultural and nutritional system, through the increased productivity of healthy and safe crops and agri-food products, responsible use of soil and water, and the inclusion of historically excluded sectors.” The three objectives of the ARDSP are:

 (a) Achieve food self-sufficiency via increased productivity of agriculture and fisheries.

 (b) Contribute to the wellbeing of the rural population by including producers historically excluded in rural and coastal communities, taking advantage of the potential of the local markets.

 (c) increase environmentally sustainable production practices in agriculture, aquaculture, and fishing to decrease environmental and climate change risks.

1. The ARDSP is intended to assist in the realization of both the right to food and the right to a healthy environment. The program states that “the transition to sustainable [agricultural] productive systems, based on the efficient use of available resources, the revaluation of local sustainable systems, and the preservation of agroecosystems with close ties between producers and consumers, will enable Mexico to fulfill the ethical and moral imperatives of contributing to guarantee the rights to a healthy environment and to a healthy and nutritious food for current and future generations, as well as fair economic remuneration for those who produce food.” Mexico also has a National Program for Agroecological Transition and Biocultural Heritage with a primary objective to reduce the use of pesticides and agrochemicals.
2. Argentina’s Law 25.724 created a National Nutrition and Food Program, which recognizes the non-delegable duty of the State to guarantee the right to food for all citizens (Art. 1). A Regulatory Decree (No. 1018/03) establishes the components of the Program, which include the prevention of specific nutritional deficiencies, food security, food quality and safety and Nutritional Food Education. Law No. 27.519 (National Food Emergency) establishes that the State is responsible for guaranteeing permanently and as a priority the right to food and the nutritional security of the population.[[5]](#footnote-5)
3. Ecuador’s *Framework Law for Food Sovereignty (2009)* promotes agroecology by requiring the state to carry out training, open special lines of credit, and develop marketing strategies, all in support of agroecological producers. Similar to the Brazilian legislation cited above, this Law states that measures to boost consumption of nutritious foods of agroecological origin are to be implemented alongside education campaigns and informative labelling programmes. Agroecological producers are given preference in public procurement schemes.[[6]](#footnote-6) Ecuador’s *Framework Law of Agrobiodiversity, Seeds and Promotion of Sustainable Agriculture (No. 10 of 2017)* recognizes the importance of traditional seed systems (developed by local or indigenous communities) producing, reproducing, exchanging, marketing and maintaining their own seed, under multiple modalities. The Law’s sustainability principle guarantees the production of seeds by ensuring efficient use and conservation of agrobiodiversity to guarantee food sovereignty and security. Respect for traditional values, cultural practices and national identity is also listed as a principle to facilitate the production, use and exchange of native and traditional seeds, as well as the sharing of such seeds and associated practices. Ecuador’s *Organic Law of Rural Lands and Ancestral Territories*, which advances the rights of peasants, small-scale farmers, Indigenous peoples, and Afro-Ecuadorian and Montubio nationalities to conserve their communal property and manage these lands in perpetuity. The law highlights the importance of respect for different forms of life, values, traditions and cultural practices.[[7]](#footnote-7)
4. Brazil’s (Rio Grande do Sul) *Law creating the State Policy on Organic Production and Agroecology (No. 14 486 of 2014)* declares that the Law is guided by the principles of sustainable development. These include among others: participation; ecological conservation; social inclusion; food security and sovereignty; socioeconomic, gender and ethnic equity; and agricultural, biological, territorial, landscape and cultural diversity.[[8]](#footnote-8)
5. Nicaragua’s *Law to promote agroecological or organic production (No. 765 of 2011, as amended in 2014)* defines ‘agroecosystems’ to mean: “Ecological systems that have one or more types of agriculture whose main components are the subsystems of crops or animal production, identified with the parcels or areas of the farm, and the broader environment with which those components interact.”[[9]](#footnote-9)
6. In 2013, El Salvador reformed two laws: the *Law on Control of Pesticides, Fertilizers and Products for Agricultural Use*; and the *Plant and Animal Health Law*. The law reform established the gradual prohibition over two years of the use of 53 pesticides and fertilizers containing heavy metals or metalloids in their formulation. The Ministries of Agriculture and Livestock and Health will coordinate the implementation of the new rules, and non-compliance will result in economic sanctions.
7. Nepal’s *Right to Food and Food Sovereignty Act, 2018* is intended to improve the food security of impoverished households through initiatives to: provide ration cards; maintain food supply during emergencies; protect the rights of farmers; sustainably use agricultural land; promote local food systems; and adapt to climate change. As a result of enhanced irrigation, distribution of high-yielding seeds, and the introduction of limited volumes of chemical fertilizers, the status of food security has improved. Other programs introduced by Nepal include the Advanced Seed Program, Project for Income Raising of Small and Medium Farmers, Agriculture Insurance Program, and Minimum Support Price Program to ensure food and nutrition security. Data indicate that agricultural production, particularly rice, wheat, maize, vegetables, and potatoes has increased.[[10]](#footnote-10)
8. In the Philippines, the *Indigenous Peoples Rights Act of 1997* is a landmark law recognizing and promoting the rights of Indigenous peoples. A key provision authorizes the granting of Certificates of Ancestral Land/Domain Titles for the ancestral lands of Indigenous individuals or Indigenous groups (a tribe, village, or community). The law also requires the free, prior and informed consent of Indigenous peoples for projects and other activities that are proposed for ancestral lands or domains.
9. Under Zambia’s *Protection of Traditional Knowledge, Genetic Resources and Expressions of Folklore Act (No. 16 of 2016),* the grounds for protection of traditional knowledge include: (i) where such knowledge generated, preserved and transmitted in a traditional and intergenerational context; (ii) where it is associated with a distinct traditional community, individual or group; or (iii) where it is integral to the cultural identity of the group holding the knowledge through collective custodianship through customary laws and practices (Section 14). The Act protects rights holders from infringement, misappropriation, misuse and unlawful exploitation in relation to traditional knowledge and genetic resources. It also enshrines the rights of a traditional community in regulating access, its’ right to use and to share benefits from the use of its genetic resources; and the right to assign and conclude access agreements (Section 27).
10. Laws that recognize the land rights of indigenous peoples and local communities have recently been passed by Kenya (the *Community Land Act of 2016*), Mali (*Agricultural Land Law of 2017*) and Zambia (*Forest Act of 2015*). The Malian law, by protecting customary tenure systems, creates space for communities to self-manage their resources, based on collective rights and according to rules defined by each community. Indigenous peoples and local communities are more likely to invest in the good management of forests, soil and water if they have clear user rights and security against eviction. They are more likely to invest in improving yields on existing land and less likely to extend cultivation into marginal or forest areas. Forests that are legally owned and/or designated for use by Indigenous peoples and local communities deliver a wide range of ecological and social benefits, including lower rates of deforestation and forest degradation, greater investments in forest restoration and maintenance, improved biodiversity conservation, lower carbon emissions and more carbon storage, reduced conflict, and poverty reduction.[[11]](#footnote-11)
11. Liberia’s *Community Rights Law* (2008) empowers communities to access, manage, use and benefit from forests for their sustenance, livelihoods and community development. While implementation of the law has had some challenges, it has led to new programs and measures that support conservation and sustainable livelihood activities in forest communities.
12. In 2019, Burkina Faso enacted a law on “Access to plant genetic resources for food and agriculture and the sharing of benefits arising out of their use”. The law contains a chapter on farmers’ rights, which explicitly recognizes farming communities’ rights over seeds as enshrined in the International Treaty on Plant Genetic Resources for Food and Agriculture as well as the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas.[[12]](#footnote-12)
13. The European Union’s *Regulation of the European Parliament and of the Council on organic production and labelling of organic products and repealing Council Regulation (EC) No. 834/2007 (2018/848)* requires operators to comply with general production rules, and this involves, for example, the use of products or substances that have been authorized for organic production (Article 9). Restrictive lists guide the use of plant protection products, soil conditioners and fertilizers, non-organic feed or feed additives. Ionizing radiation is not to be used to treat organic food or feed or composite raw materials. Certain practices and materials—animal cloning, genetically-modified organisms (GMOs) and chemically synthesized substances—are prohibited on the basis of the precautionary principle to avoid deleterious effects on the environment or human health.[[13]](#footnote-13)
14. Ireland introduced a Rural Environment Protection Scheme REPS in 1994 that has been proven to be effective. Farmers must follow a 5-year environmental plan in order to receive an annual payment. Among the mandatory tasks are soil testing, fencing off watercourses, and planting hedgerows. The program ensures that farming practices and production methods are updated to improve environmental outcomes.
15. In 2015 Poland adopted a land transaction intended to protect agricultural land from large foreign or domestic investors who would establish agribusinesses to the detriment of family farming. It also set out procedures that allowed individuals to appeal against administrative proceedings in the event that they were wrongly denied their right to purchase farmland.[[14]](#footnote-14)
16. The United Kingdom adopted a new law which will require greater due diligence from businesses, and make it illegal for UK businesses to use key commodities if they have not been produced in line with local laws protecting forests and other natural ecosystems. Similarly, the European Commission is developing a law intended to minimize the risk of deforestation and forest degradation associated with products placed on the EU market. These new rules should reinforce requirements for companies to demonstrate that their supply chains do not involve deforestation or forest degradation. A major emphasis will be the agriculture commodities that are most known to lead to land conversion (including palm oil, soy, beef, timber, cocoa and coffee). The European Free Trade Association, comprised of Iceland, Norway, Switzerland and Liechtenstein, adopted a slightly different approach, including requirement on sustainability of palm oil as a part of their trade agreement with Indonesia. In fact, Switzerland consistently seeks to reduce adverse effects of its food imports abroad by including sustainability clauses in trade agreements.

 III. Agroecology, Agroforestry and Other Sustainable Food Production Practices

1. Agroecological farming can help to improve livelihoods for small-scale farmers and those living in poverty, including women, because it limits reliance on expensive external inputs and focuses on increasing equity. Agroecology improves air, soil, surface water and groundwater quality, is less energy-intensive, reduces emissions of greenhouse gases and enhances carbon sinks (A/HRC/16/49, para. 31). The United Nations Food and Agriculture Organization identified agroecology policies in Brazil, Denmark, Ecuador, India, the Philippines, Senegal and the United States as winners of Future Policy Awards in 2018 for scaling up agroecology, improving the livelihoods of small-scale food producers, ensuring sustainable food production systems and implementing climate-resilient agricultural practices.[[15]](#footnote-15) Agroecology projects in Benin, Brazil, Cameroon, Cuba, Egypt, India, Mozambique, Nepal, the Niger and the Philippines were recognized for good practices by the World Future Council in 2019.[[16]](#footnote-16)
2. A handful of bilateral donors and international organizations — led by France, Switzerland, Germany, the [Food and Agriculture Organization](https://www.devex.com/organizations/food-and-agriculture-organization-of-the-united-nations-fao-44117), and [International Fund For Agricultural Development](https://www.devex.com/organizations/international-fund-for-agricultural-development-ifad-44565) — specifically identify agroecology as a sustainable approach for achieving food security.
3. Malawi’s lush climate and rich soil are well suited for agriculture, and more than three quarters of the work force are involved in farming. However, over half of all farmers in Malawi operate below subsistence levels and only 20 percent of maize farmers produce a surplus that they can sell. Malawi uses incentives and social networks to increase farmers’ knowledge of sustainable practices. Agricultural Extension Development Officers provide incentives to lead farmers—literate community leaders and early technology adopters with access to resources—and peer farmers—similar to the average farmer in the village but with a willingness to try new technologies—to spread the word about innovative practices. This approach led to significant levels of adoption and increased yields.
4. From 2016-2020, the civil society organization Hivos hosted the Zambian Food Change Lab, a social change process that brought together food system stakeholders from different societal sectors, to jointly identify the country’s most pressing food system issues and potential pathways for solutions. The main focus of the Food Change Lab was to make a case for diversification of the Zambian food system (food production and consumption) to increase food diversity, public health, soil fertility and agro-biodiversity. However, with markets for other crops than maize being undeveloped, shifting resources from maize to crops like sorghum and millets would potentially risk short term food security and income loss as farmers would have to invest in uncertain markets. A well-managed and government-managed national food diversification program would mitigate these risks. Advocacy work done by the Lab’s participants informed the Ministry of Agriculture’s crop diversification strategy.[[17]](#footnote-17)
5. The Somali Agriculture Technical Group (SATG) is a non-profit organization dedicated to creating sustainable agriculture in Somalia using practical and scientific homegrown solutions. Their work includes preserving seeds specifically connected to the Somali culture, improving production techniques for higher yields, as well as training and collaborating with numerous people at the local, regional, national and international levels. The SATG has provided farming machinery and training modules on the plants being grown, how they should be cultivated and how to make the production sustainable and long-term.
6. In Mexico, agroecological milpa—involving intercropping of vegetables (corn, beans, squash, chilies and others) with shrubs and trees—is an ancient Indigenous custom. Intercropping milpa with fruit trees is a sustainable way to intensify the cultivation of native corn, substantially increasing family income while increasing production within the historical milpa system.[[18]](#footnote-18)
7. In Brazil, the Movimento dos Trabalhadores Sem Terra Ruraes (Rural Landless Workers’ Movement) adopted and promotes agroecology among its 1.5 million members. It has implemented educational processes such as the creation of 12 autonomous agroecology schools, and the Latin American School of Agroecology, in Paraná. Brazil’s Rede Ecovida or Ecolife Network is a decentralized system of 29 farmers’ organizations, thousands of farming households, 10 cooperatives, 180 farmers’ markets and dozens of food businesses. The network connects producers and consumers across three states in southern Brazil, using participatory methods to increase the use of agroecological practices, care for nature, and appreciation for food and justice. The reduction of soil erosion in Brazil through the application of no-tillage practices from 1980 onwards is estimated to have led to a reduction of erosion rates by 70-90 percent over large parts of Brazilian cropland.[[19]](#footnote-19)
8. Zero Budget Natural Farming is both a suite of agricultural methods and a grassroots peasant movement that began in India’s Karnataka region. Millions of Indian farmers use this approach which involves reducing dependence on expensive external inputs and using agroecological methods such as mulching, intercropping, and biological pest control.
9. Nepal’s Biodiversity Strategy and Action Plan (2014-2020) explicitly includes the right to a healthy environment and recognizes that agricultural diversity is essential to food security. Nepalese farmers have a long history of effectively using traditional botanical pesticides to protect their crops.[[20]](#footnote-20)
10. Turkey passed a law on organic agriculture in 2004 and a by-law on organic agriculture principles and practices in 2010. The number of farmers and areas under organic cultivation has grown rapidly since 2010, with the area in organic production jumping more than 60 per cent between 2010 and 2014.[[21]](#footnote-21)
11. The Ecological Organic Agriculture Initiative of the African Union and the Community of Latin American and Caribbean States has promoted agroecological practices and policies on a regional scale. In Cuba, sustainable agriculture, organic agriculture, urban gardens, low-scale agricultural systems, animal traction and biological pest control, became the pillars of the new Cuban agriculture. Today, nearly 100,000 Cuban families - almost half of Cuba's independent smallholder population - are members of the National Association of Small Farmers, which promotes agroecological practices. These families produce more than 65% of the country's food on only 25% of the arable land and participate in the Campesino a Campesino movement, which involves the transmission of knowledge and the exchange of experiences. Havana has more than 25,000 huertos – allotments, farmed by families or small groups – and dozens of larger-scale organoponicos, or market gardens. To reduce the use of agricultural chemicals, farmers use integrated pest management, crop rotation, composting and soil conservation.
12. Argentina’s Advisory Commission for Organic Production, created in 1999 by National Law 25,127 and coordinated by the National Ministry of Agriculture, Livestock and Fisheries, promotes organic production and produced the Strategic Plan for the Argentine Organic Production Sector 2030.
13. Conservation Agriculture is 20 to 50 percent less labour intensive and thus contributes to reducing greenhouse gas emissions through lower energy inputs and improved nutrient use efficiency. At the same time, it stabilizes and protects soil from breaking down and releasing carbon to the atmosphere.[[22]](#footnote-22) In Mexico, legumes in rotation with maize contribute organic matter and nitrogen that help boost maize yields by 25 percent. Zero tillage contributes to higher wheat yields, in the range of 6 to 10 percent, because it allows for timely sowing, leads to a better crop stand, and generates big savings on tractor operations, time and fuel. On the western, Indo-Gangetic plains, the adoption of zero-tillage in wheat production reduced farmer’s costs per hectare by 20 percent and increased net income by 28 percent.[[23]](#footnote-23)
14. The agri-food sector in Ireland has benefited from an approach to strategic planning involving the development of ten-year stakeholder-led strategies, updated every five years. Since their inception twenty years ago, up to the current Food Wise 2025 (FW2025) Strategy[[24]](#footnote-24), these have provided the sector with a coherent, stakeholder-led vision to underpin its continued development. The current strategy includes eight overarching sustainability recommendations with over 80 individual environmental actions. An Environmental Sustainability Committee was established as a sub-group of the High-Level Implementation Committee, following a recommendation in Food Wise 2025 and the accompanying Strategic Environmental Assessment. The Environmental Sustainability Committee identified 26 priority actions. At the end of 2019, approximately 27% of these actions have been achieved; 42% have substantial action undertaken and are ongoing; and 31% of actions have commenced and are progressing. Some of the positive environmental actions that have taken place include:

 (a) Pilot Farm Hazardous Waste Collection Scheme;

 (b) Code of Good Practice for Reducing Ammonia Emissions from Agriculture;

 (c) Voluntary Nitrates Derogation Review;

 (d) Agricultural Sustainability Support and Advisory Programme;

 (e) A high-level Bioeconomy Implementation Group;

 (f) Agriculture, Forest and Seafood Climate Change Sectoral Adaptation Plan;

 (g) European Innovation Partnerships projects focusing on themes such as: the preservation of agricultural landscapes; water quality; resource efficiency; climate mitigation / adaptation and biodiversity;

 (h) Workshops including the Grassland Symposium, the Cross-sectoral Seminar on Climate Change Adaptation and the 2018 Environmental Sustainability Dialogue;

 (i) Publication of the climate and air roadmap for the agriculture sector;

 (j) Research projects such as Beef Data and Genomics Programme and Green Low-Carbon Agri-Environment Scheme.

 (k) The Agri-Food Strategy to 2030, which has adopted a food systems approach that incorporates nutrition, well-being and the environment.[[25]](#footnote-25)

1. In recent years, the UN’s International Fund for Agricultural Development (IFAD), which strives to reduce poverty and hunger in rural areas of low-income States, has strengthened its focus on measuring results. The IFAD Impact Assessment Initiative represents a pioneering effort to document the evidence of IFAD’s impact. Outputs reported in 2016 include:

 (a) 2 million people trained in crop production practices and technologies

(b) 1.6 million people trained in livestock production

(c) 1.4 million people trained in natural resource management

(d) 3.6 million hectares of common-property-resource land under improved management

(e) 16,000 kilometres of roads constructed or repaired

(f) 32,000 marketing groups formed or strengthened

(g) 1 million people trained in business and entrepreneurship

(h) 50 per cent of people receiving services from IFAD-supported projects were women

1. Danone, a transnational food corporation, promotes regenerative agriculture to protect soil, empower farmers and promote animal welfare, and provides financial and technical support to more than 100,000 farmers worldwide. In Mexico, for example, it supports strawberry producers to implement sustainable soil practices and better water management, reducing the environmental impacts of growing strawberries while increasing producers’ income. In Senegal, Danone supported the one of the world’s largest mangrove restoration projects, with 79 million mangrove trees replanted in 10,000 hectares.[[26]](#footnote-26)

A. Agroforestry

1. Agroforestry, whether organized as trees in agricultural landscapes or farming in forest landscapes, optimizes the links between agriculture, forestry and biodiversity. Agroforestry has five major roles in biodiversity conservation: provides habitats for species that can tolerate a certain level of disturbance; helps to preserve germplasm of sensitive species; reduces rates of conversion of natural habitats by providing a more productive, sustainable alternative to traditional agricultural systems that may involve clearing natural habitats; provides connectivity between habitat remnants; and provides ecosystem services such as erosion control and water recharge, thereby preventing the degradation and loss of surrounding habitats.[[27]](#footnote-27)
2. In Kenya, the Green Belt Movement, for which Wangari Maathai won a Nobel Peace Prize in 2004, has planted more than 51 million trees. This grass-roots organization sponsors 4,000 tree nurseries that produce more than eight million native seedlings annually. More than 30,000 women received training in forestry, beekeeping, food processing and other trades, enabling them to earn a livelihood while protecting local lands and ecosystems. Similar movements now exist in Uganda, the United Republic of Tanzania and other African States.
3. In Tanzania, 350,000 hectares of land have been rehabilitated in the Western provinces of Shinyanga and Tabora using agroforestry; there are similar large-scale projects in Malawi, Mozambique and Zambia.[[28]](#footnote-28) Malawi is using nitrogen-fixing trees to ensure sustained growth in maize production. More than one million of Malawi’s poorest people have benefitted from this approach.
4. The Mountain Partnership Products (MPP) initiative is a certification and labelling program that provides technical and financial support to small producers in mountain regions to create enterprises, enhance their marketing skills and boost their livelihoods by improving the value chains of products such as organic food, textiles and tourism services. The initiative promotes short, domestic value chains while ensuring transparency and trust between producers and consumers, fair compensation for the primary producers, conservation of agrobiodiversity and preservation of ancient techniques. Each product has a label that tells the story of the product’s origins, production method, nutritional value (in the case of foods) and role in the local culture, enabling consumers to make informed purchases. To date, the initiative has supported about 10,000 farmers, sixty percent of whom are women. An example of a product supported by the MPP initiative is honey from stingless bees, carefully harvested by a cooperative of 160 Indigenous women of the Guarani community in Serranía del Iñao National Park, Chaco Province, Bolivia (Plurinational State of). Although Guarani families have reared bees since ancient times, the honey has become rare because of deforestation and the introduction of European honeybees. Perfectly adapted to the local environment, stingless bees are crucial pollinators; their displacement could lead to a significant loss of forest biodiversity. This initiative improves the livelihoods of beekeepers, conserves native bee species, and helps to maintain plant biodiversity through pollination.[[29]](#footnote-29)
5. The Forest and Farm Facility in Yen Bai Province, Vietnam, supports members of a farmers’ union to grow cinnamon, star anise, plants for herbal medicine and mulberry for silkworm farms. Farmers market their products collectively and have worked together to learn and apply organic growing techniques. In 2019, a US$3.5 million cinnamon processing factory was completed so that the cooperatives could supply organic cinnamon to the global market.[[30]](#footnote-30) The Non-Timber Forest Products Exchange Programme supports forest-based communities in Asia by helping them develop sustainable businesses. Efforts include assisting with a certification scheme for rattan production in Indonesia and marketing sustainable, handwoven eco-textiles in the Philippines and Indonesia.[[31]](#footnote-31)
6. In Indonesia, a milestone Constitutional Court decision in 2012 established that ​customary forests are not state forests but a separate category that may be formally recognized as Indigenous or community customary forests​. The decision was also based on food security, because forest ecosystems are an essential source of food for many Indigenous and rural communities. More than 4 million hectares of forest in Indonesia are under some form of community management, but only about 40,000 hectares have been recognized as customary forests (i.e. are no longer categorized as state forest).[[32]](#footnote-32)
7. In Mexico, the Sembrando Vida (Sowing Life) program creates jobs, contributes to reforestation and respect for biodiversity, and improves living conditions in rural areas. Peasants and other rural residents can receive support of five thousand pesos per month, of which 500 are destined for a savings bank, as well as seedlings and other materials for tree planting. The Sembrando Vida program promotes agroforestry, organic agriculture and regenerative cornfields growing heritage varieties. An emphasis is placed on education, shared decision-making, and the value of traditional knowledge and customs. In addition, the program seeks greater social inclusion of rural and Indigenous women, strengthening women's access to economic and productive resources, to technology, savings and training aimed at promoting the social integration of women. While one-third of registered planters are female, half of scholarship recipients are young women.[[33]](#footnote-33)
8. The Brazil nut (the seed of the rainforest tree *Bertholletia excelsa*) is the only globally traded edible seed currently collected from the wild by forest-based harvesters. Over the past few decades, the harvesting of Brazil nuts has supported the “conservation through use” of millions of hectares of Amazonian forest by tens of thousands of rural households. The nuts contribute significantly to local livelihoods, national economies and forest-based development in a large geographic area, generating tens of millions of dollars in annual export value in the Plurinational State of Bolivia, Brazil and Peru. The tree reacts robustly to the type and level of nut harvesting currently practised. The resource users have developed endogenous management systems that sustain productivity.[[34]](#footnote-34)

 B. Women

1. WWF-Indonesia​is helping to build recognition of women’s role in marine and coastal resource management to counter the exclusion of women from governance mechanisms, decision making, budget allocations and even conservation initiatives, despite their vital role in natural resource management. Rural and Indigenous women play a vital role as ‘ecological keepers’ by managing ecological and economic assets for families and communities. They fish and gather shells in tidal and mangrove areas, which they sell to support their livelihood. WWF-Indonesia is supporting initiatives by Indigenous and rural women that empower them as economic and ecological actors: local markets and organic/local produce; entrepreneurship; freshwater and coastal fisheries; Indigenous agricultural practices and training.[[35]](#footnote-35)
2. The Committee on the Elimination of all forms of Discrimination Against Women has commended States for taking action to empower women in the conservation and sustainable use of biodiversity. For example, the Committee applauded Samoa for the focus on rural women in its National Biodiversity Strategy and Action Plan 2015-2020.[[36]](#footnote-36) The Committee complimented Argentina for its Rural Lands Act (No. 26.727 of 2011), which emphasizes the need to protect biodiversity and ensures that women have equal rights to access land, enter into contracts, and administer assets.[[37]](#footnote-37)
3. In order to ensure food and nutrition security for its citizens, the Government of Kenya has under the National Accelerated Agricultural Input Access Programme targeted, female and child headed households. These households are given preference when selecting resource poor farmers to be issued with the grant input package for cereal production. During the period 2017- 2019, about 361,550 female farmers have been supported with the package and capacity building/training sessions.
4. Honduras has a School for Equality and Empowerment of Rural Women, which trains women in leadership, environmental protection, among others.

 C. Indigenous Peoples and Local Communities

1. Many Indigenous communities practice the traditional agricultural system of rotational farming, where cultivation shifts and leaves areas fallow for long periods to regenerate forests and wildlife habitat. Examples include the tropical forests of Indonesia and the Chittagong Hill Tracts of India, where women play a major role in seed preservation.[[38]](#footnote-38)
2. 49. The *sulagad* system of the Teduray and Lambangian peoples in Maguindanao, Southern Philippines involves traditional agroecological practices that respect spirits in nature and include the use of intercropping, rotational cropping, natural organic fertilizers, production good enough for the family and for sharing until the next harvest. The *sulagad* system suffered from the impacts of “agricultural modernization” programs that caused soil degradation and increasing dependence on expensive chemical inputs. However, the *sulagad* system is undergoing a renaissance as Indigenous people forcefully re-assert their land rights, prevent land grabs, and return to their traditional land-use practices. [[39]](#footnote-39)
3. The Maya Biosphere Reserve in Guatemala is one of the world’s most biodiverse areas. To help to conserve the reserve, the Government gave nine local communities land concessions so they can make a sustainable living from the forest. The concessions have generated more than $5 million in annual revenue, as well as jobs for local community members. The forest concessions have had a near-zero deforestation rate for the past 14 years. According to research, there is a positive relationship between socioeconomic progress (income, investments, savings, capitalization of community enterprises, and asset building at the household and enterprise levels) and conservation of the concession areas.[[40]](#footnote-40) Guatemala also has had positive experiences promoting "Agroecological Peasant Markets," which enables peasants to sell native, clean, healthy and nutritious food, produced in an agroecological way, on a small scale.
4. The Supreme Court of Mexico ruled in 2015 that the government has a legal duty to consult Indigenous peoples before permitting the planting of genetically modified crops. In 2017, the Mexican government revoked Monsanto’s permit to grow genetically modified soybeans in seven states. Mayan Indigenous communities were concerned about the impacts of genetically modified crops and associated pesticides on their native crops, beekeeping traditions, and biodiversity.[[41]](#footnote-41)
5. Borneo is an island shared by Indonesia, Malaysia and Brunei. In response to the increasing promotion of agro-chemicals and the threat of expansion of oil palm plantations, in 2016, the Alliance of the Indigenous Peoples of the Krayan Highlands declared their homeland in Borneo as a “territory of life” for organic and traditional agriculture.[[42]](#footnote-42) There is a complementary project, called the Heart of Borneo Initiative, which seeks to integrate respect for local forest communities with the effective conservation and management of millions of hectares of rainforests through a network of protected areas and sustainable use of the forest.
6. In Benin, Cameroon, Ethiopia, Kenya, South Africa, Uganda and Zimbabwe, a network of civil society organizations is working with Indigenous and traditional communities to revive and strengthen their customary governance systems, restore ecosystems, and protect their sacred natural sites. These efforts are supported by the 2017 resolution of the African Commission on Human and Peoples Rights.[[43]](#footnote-43)
7. In the United States of America, the Utah Diné Bikéyah are connecting cultural knowledge with land preservation through their Bears Ears Indigenous Food Movement in order to revitalize traditional indigenous food sourced from lands managed by a consortium of five sovereign tribal nations.[[44]](#footnote-44)
8. The Nagoya Protocol on Access and Benefit-sharing is a supplementary agreement to the UN Convention on Biological Diversity. One of the protocol’s fundamental objectives is the fair and equitable sharing of the benefits arising out of the utilisation of Indigenous biological resources, including those related to food. The protection of traditional knowledge, and the equitable sharing of benefits from the commercial use of genetic resources through Access and Benefit Sharing (ABS) agreements can also constitute a powerful incentive for protecting cultural and biological diversity.[[45]](#footnote-45)
9. South Africa’s *National Environmental Management: Biodiversity Act 10 of 2004* and the *Bioprospecting, Access and Benefit Sharing Regulation of 2008* provide a domestic legal framework for access and benefit sharing. In 2019, after nine years of negotiations, the world’s first industry-wide benefit-sharing agreement was launched in South Africa between the Khoikhoi and San Indigenous peoples, and the South African rooibos industry.[[46]](#footnote-46) The agreement recognizes the Khoikhoi and San peoples as the traditional knowledge holders for the uses of Rooibos, an indigenous plant species found only in the Cederberg region of South Africa. The agreement ensures that the Khoikhoi and San peoples will receive substantial economic benefits from the commercialisation of Rooibos. The Khoikhoi Peoples’ Rooibos Biocultural Community Protocol complements the industry-wide Benefit Sharing Agreement. The protocol articulates the customary laws related to consent of the Khoikhoi Indigenous communities (including Cederberg farming communities).
10. Costa Rica created a National Commission for the Management of Biodiversity (CONAGEBIO) in charge of approving permits for access to genetic and biochemical resources. The Commission ensures that free, prior and informed consent is granted by Indigenous peoples and guarantees the fair and equitable distribution of benefits. Two recent examples demonstrate these outcomes, with the State serving as a bridge between the private sector and local communities. Chanel Parfums Beaute, a cosmetics company, secured a permit to use the anti-inflammatory and antioxidant properties of a coffee plant in cosmetic products, generating significant income for coffee producers. A Costa Rican company, Lisanatura, secured the consent of a rural cooperative to use essential oils from organically cultivated medicinal plants in the formulation of a cough syrup.[[47]](#footnote-47)

 IV. Reducing Water Scarcity

1. Many States are improving irrigation systems in order to substantially reduce water use including Bangladesh, Egypt, Kenya, Kyrgyz Republic, Malawi, and Uganda. For example, Bangladesh is practicing an alternate wetting and drying method of irrigation for rice production in different parts of the country, which reduces water use 15 to 30 per cent while maintaining yields.[[48]](#footnote-48) Egypt is making efforts to increase the use of highly efficient drip irrigation. Sekem, an Egyptian company, has pioneered organic farming and the complete reuse of wastewater after treatment. Jordan, Kuwait and Oman use at least secondary treatment for wastewater prior to water re-use in agriculture.
2. Improved water management practices are most effective when combined with improved agricultural practices, such as the use of drought-tolerant crop varieties. While sprinkler and subsurface drip irrigation have the potential to increase irrigation efficiency when compared to gravity surface irrigation systems, irrigation schedules based on real-time crop requirements, soil water monitoring and short-term forecasts also appear to be good options. Scheduling irrigation based on soil water content and crop requirements could produce water savings of up to 35 per cent with no yield penalty compared with standard farming practices. Centre pivot systems use 30 per cent less irrigation water than gravity surface irrigation to achieve the same yield, and conservation tillage requires 20 per cent less irrigation water than conventional tillage. Crop residues under conservation tillage may diminish irrigation requirements by increasing precipitation storage efficiency and by reducing direct soil evaporation and surface run-off.
3. Egypt’s National Water Resources Plan (NWRP 2037) embodies a comprehensive approach to water planning as it addresses pollution, scarcity, flood risks, food security and climate change. The four objectives are to improve water quality, enhance availability of fresh water, fortify management of water use, and strengthen capacity for Integrated Water Resource Management planning and implementation. Egypt held competitions for farmers in 2018 and 2019 to encourage them to implement innovative approaches to conserving water.[[49]](#footnote-49)
4. In 2018, the Punjab state government in India launched a pilot project called ["*paani bachao, paisa kamao*"](https://indianexpress.com/article/cities/chandigarh/pspcl-launches-pilot-project-to-give-cash-incentive-to-farmers-for-using-less-electricity-5214904/) ("save water, earn money") in partnership with the World Bank and The Energy and Resources Institute. A select group of farmers was offered monetary compensation in exchange for reducing their agricultural groundwater consumption. The preliminary results from the project were encouraging, indicating that the approach could be scaled up.[[50]](#footnote-50)
5. An innovative program enhanced the capacity and resilience of farmers living on the floodplains of India and Bangladesh. To overcome the risks of flooding for conventional agriculture, the farmers were trained in hydroponic float farming and aquafarming, approaches that are resilient to flooding. The training and modest financial assistance enabled beneficiaries to improve their economic situations: every three months, each float farm produced 130–170 kg of vegetables and 150–200 kg of fish, for a total value of roughly $1,000. Food security improved and farmers’ earnings increased by 65–70 percent.[[51]](#footnote-51)
6. Members of Indigenous peoples and local communities in the Ayacucho region of Peru have demonstrated a number of good practices in collecting and protecting water, including: designation of a water recharge and agrobiodiversity zone; a project that collects payments from urban residents to compensate upstream communities for the ecosystem services provided by their responsible stewardship of the water supply; and recognizing water as a subject of rights. The Water Recharge Areas and Agrobiodiversity Zones are intended to ensure “the proper functioning of ecosystems, water security and the conservation, sustainable use and local management of native cultivated species and their wild relatives.” Approximately 200,000 urban residents pay one percent of their water and sewage bill to the upstream communities that protect the watershed. The upstream communities also operate an award-winning rainwater harvesting and storage program called Fondo Sierra Azul, which benefits families through improved water quality and quantity, improved agricultural production, ecosystem restoration, and less time gathering water for women and girls.[[52]](#footnote-52)
7. Kenya’s Upper Tana - Nairobi Water Fund (UTNWF) is an example of directing investment towards ecosystems services in order to enhance water security and climate resilience. The UTNWF contributes to the rehabilitation, conservation and sustainable management of Kenya’s water towers from which some 75% of the country’s water is sourced. By investing in green infrastructure upstream, costs can be recovered through reduced water treatment costs. The UTNWF is contributing to conservation, the restoration of protected areas, the sequestering of carbon, the stabilisation of the water cycle, the reduction of floods, improvements in water quality through nature-based solutions (including the planting of at least 2.5 million trees), and the lifting of more than 20,000 people in local communities out of poverty. Other potential benefits include improved cropland management, establishment of agroforestry systems on marginal lands, cultivation of perennial crops, avoided degradation of agricultural land, and improved agricultural production and nutrient management. The Upper Tana-Nairobi Water Fund estimates that a $10 million investment in watershed conservation delivers a return of $21.5 million, including savings from water treatment, increased power generation, and increased agricultural yields.[[53]](#footnote-53)
8. A good practice example and blueprint for other business sectors is the Scotch Whisky industry, which has reduced water use through innovation.[[54]](#footnote-54)

 V. Protecting and Restoring Agricultural Land and Biodiversity

1. Farmer managed natural regeneration is a low-cost land restoration technique used by subsistence farmers to increase food and timber production and resilience to climate extremes. Newly planted trees and shrubs are integrated into fields or grazing pastures, restoring soil quality, inhibiting erosion and evaporation, rehabilitating groundwater, and increasing biodiversity. This technique has proven effective in Ethiopia, Ghana, Indonesia, Kenya, Mali, Niger, Rwanda, Senegal, Timor-Leste, and Uganda, among other States. Farmer managed natural regeneration can double crop yields, provide timber for building and firewood, fodder and shade for livestock, wild foods for nutrition and medication, and increase incomes and living standards for farming families and their communities.
2. In the 1980s, Niger was devastated by drought, causing famine and forcing women to travel long distances for firewood and water. However, over the past twenty years, farmer managed natural regeneration has been used to successfully rehabilitate five million hectares of degraded farmland in Niger, boosting food security, enhancing access to water, alleviating poverty, and improving environmental quality. The annual increase in income is estimated at $900 million per year in Niger.[[55]](#footnote-55)
3. In Burkina Faso, Mali, and Niger, zaï or tassa is a farming technique to restore degraded lands, catch water and increase soil fertility. Zaï are pits dug in the soil (20-30 cm long and deep and 90 cm apart) prior to planting crops to catch water and concentrate manure and/or compost. In these West African States, stone barriers built alongside fields slow down runoff water during the rainy season, improving soil moisture, replenishing water tables, and reducing soil erosion. Used in combination with zaï, the water retention capacity is multiplied five- to ten-fold, the biomass production (e.g. trees, sorghum, and millet) increases up to five times, and livestock can feed on the grass that grows along the stone barriers after the rains. In Mali, the government uses local workshops as a means of disseminating sustainable agricultural practices that also benefit biodiversity. In 2018, fourteen workshops were held with 473 stakeholders on the protection of forest areas, assisted natural regeneration, stony ridges, zaï, and bush fire management.
4. Payment for Ecosystem Services programs, which provide financial compensation for environmental protection, have become well established in countries such as Costa Rica, Ecuador, Mexico, and Vietnam. These programs have been successful in reducing deforestation and promoting reforestation, particularly when used in combination with protected areas, community development efforts, and reorientation of agricultural growth in forest-friendly directions.
5. In 1997, Costa Rica started a program to improve the livelihoods of Indigenous peoples, small-scale farmers, agroforestry producers, and landowners by paying them to conserve, restore, and sustainably use forests. The program focused on low-income and Indigenous communities and has resulted in the conservation and protection of more than 1.2 million hectares of forest and the payment of over $500 million between 1997 and 2018. Almost 3,000 women landowners have signed contracts to receive funds under this program. Funding comes from Costa Rica’s carbon tax, and has grown consistently, enabling contracts for an average of 270,000 hectares per year from 2014 to 2018. Additional benefits include reduced greenhouse gas emissions, carbon storage, protection of water, protection of biodiversity for conservation and sustainable use, and protection of nature’s beauty, which benefits the people and the tourism industry.
6. Based on the success of Costa Rica’s first payment for ecosystem services program, a second initiative called the Biodiversity Conservation Program (BCP) was launched in 2015. An endowment fund was created, and the returns from its investments are used for biodiversity conservation on private land. The BCP is based on two main components, a financial incentive granted per hectare and non-financial incentives such as training, sharing experiences, and support on key issues for producers, enabling them to improve their economic returns by implementing best practices. Women make up 27 percent of BCP participants to date. The two programs have helped Costa Rica reverse deforestation and increase forest cover from one-quarter of the country to more than half of all land.
7. Mauritania and Guinea-Bissau have negotiated financial support within the framework of European Union’s Fisheries Partnership Agreements (FPAs) to help finance the creation and management of marine protected areas. The agreements resemble international payments for ecosystem services. To protect these funds from shifting political priorities, conservation trust funds have been created in both countries. These trust funds are independent entities financed by a range of international and national sources. Mauritania’s trust fund exceeds 20 million Euros while the more recent Guinea-Bissau trust fund is five million Euros.[[56]](#footnote-56)
8. Ecuador’s Socio Bosque Program, started in 2008, offers financial incentives to both individual and collective landowners in the form of annual per-hectare payments in exchange for their help in protecting native forests and other ecosystems. The program conserves biodiversity reduces carbon emissions and alleviates poverty in rural areas. Ecuador has been able to reduce deforestation and protect 1.6 million hectares of native forests as a result of this initiative.
9. Mexico began a similar program in 2003, assisting poor rural communities that expressed commitments to environmental conservation. Funds are invested in various forest management activities including firefighting, controlling pests and diseases, fencing to keep out livestock and patrols to prevent poaching and illegal logging.[[57]](#footnote-57)
10. More than 120 countries have made commitments pursuant to the Land Degradation Neutrality Target Setting Programme established under the auspices of the *United Nations Convention to Combat Desertification*. Regional land restoration goals include the Latin American Initiative 20x20, which aimed to restore 20 million hectares of degraded land by the end of 2020; the African Forest Landscape Restoration Initiative, which aims to rehabilitate 100 million hectares of degraded land by 2030; the Agadir Commitment for the Mediterranean, which aims to restore at least 8 million hectares of degraded forest ecosystems by 2030; ECCA30, an initiative of countries in Europe, Caucasus and Central Asia that aims to restore 30 million hectares of degraded land by 2030; and the Great Green Wall for the Sahara and the Sahel initiative, which aims to restore 100 million hectares by 2030.
11. The Great Green Wall is an extraordinary initiative involving Algeria, Benin, Burkina Faso, Cameroon, Cabo Verde, Chad, Djibouti, Egypt, Eritrea, Ethiopia, the Gambia, Ghana, Libya, Mali, Mauritania, the Niger, Nigeria, Senegal, Somalia, the Sudan and Tunisia. The Great Green Wall will help to combat climate change, drought, famine, conflict and migration. Senegal has already planted more than 12 million drought-resistant trees. In Ethiopia, 15 million hectares of degraded land have been restored and hundreds of millions of trees planted. In the Niger, 5 million hectares of land have been restored, producing an additional 500,000 tonnes of grain annually, enough to feed 2.5 million people.[[58]](#footnote-58)
12. Nature Iraq (BirdLife in Iraq), a civil society organization, has worked to restore large areas of Mesopotamian marshes that were drained in the 1990s. Between 40 percent and 60 percent of the drained area has been re-inundated, and as a result of ongoing management efforts, some of these marshes are once again providing water, food, shelter and income for the Indigenous Marsh Arab peoples.[[59]](#footnote-59)
13. Cote d’Ivoire has developed an action plan to address problems associated with alien invasive species. Herbivorous insects are being used to control 3 alien invasive species, namely, water hyacinth (Eicchornia crassipes), water fern (Salvinia molesta), and water lettuce (Pistia stratiotes). This is environmentally superior to using pesticides, and in an interesting innovation, ground up water hyacinths are being composted for use as fertilizer.
14. Belgium has a federal plan targeting the preservation of pollinators, particularly bees. The plan includes about 30 actions and measures dealing with six main issues: risk assessment (including pesticide risk analysis); integration of pollinator management into other policies and measures (including economic measures); orientation of markets in favour of pollinators; monitoring of honey bees and wild bees; animal-health policy; and the traceability of hives (for honey bees only).
15. Within Austria’s national biodiversity campaign “vielfaltleben” (living diversity) more than 50 species protection projects have been carried out jointly with NGOs and landowners that contributed to the improvement of the status of endangered species and their habitats. For example, the population of lapwings in the province of Vorarlberg has increased tenfold because of actions by farmers to take care of the birds’ nests. A number of projects to conserve and restore species and their habitat is financed and carried out by the Austrian Rural Development Programme. Among others, the increasing population of the Great Bustard (one of the world’s heaviest flying birds) has become a great success.[[60]](#footnote-60)
16. The Transboundary Agro-ecosystem Management Project for the Kagera River Basin was implemented by the FAO with financing from the Global Environment Facility. The project, which operated in the border area of the Burundi, Rwanda, Uganda and the United Republic of Tanzania, promoted payment for ecosystem services programs for a range of environmental services, such as carbon sequestration, watershed management, and biodiversity and landscape preservation.  These schemes have delivered financial and non-financial benefits to farmers.[[61]](#footnote-61)
17. The Lubombo Trans-frontier Conservation Area was established in 2014. Co-managed by Eswatini, Mozambique and South Africa, it connects the Lubombo Mountains to coastal wetlands, incorporating nature and game reserves, forest parks, and other conservation sanctuaries and forming a large protected area that covers more than 10,000 square kilometres. Communities that have allocated their land for conservation and natural-resource management benefit from outreach programmes that generate income, such as beekeeping and chili-pepper production or supporting the maintenance of community eco-lodges, campsites and trail networks. Other projects include the implementation of permaculture, climate-smart agriculture and conservation agriculture. The spread of beekeeping through the community outreach programmes has led to a decline in poaching and illegal honey harvesting in the nature reserves.
18. The European Union’s biodiversity policy highlights the connections between healthy ecosystems and poverty eradication, and insists that these two challenges be addressed together. The rights-based approach is at the heart of the external dimension of the European Union’s biodiversity policy, in line with the European Consensus for Development.[[62]](#footnote-62) The European Union’s 2030 Biodiversity Strategy, with a budget of 20 billion Euros, set a target of transforming at least ten per cent of today’s agricultural land into “high-diversity” landscapes with the creation of features such as buffer strips, hedges, ponds and fallow land, while 25 percent of agricultural land is to be managed organically by 2030. Additional commitments include reducing the use of chemical pesticides by 50 percent, planting three billion trees by 2030 and reversing the decline in pollinators. The European Union will also establish legally binding targets to restore degraded and carbon-rich ecosystems such as meadows, wetlands, peatlands, bogs, marshes, grasslands and forests. The European Union’s Integrated Landscape Management programme, adopted in 2019, is intended to support solutions that balance sustainable land use, food security, climate change mitigation and adaptation, and the preservation of ecosystems. The programme, with a budget of EUR123 million to benefit at least 21 countries, focuses on protected areas, wildlife and forest-products trafficking, and productive landscapes and livelihoods.[[63]](#footnote-63)
19. The Wetlands Reserve Program (now the Agricultural Conservation Easement Program) in the United States paid farmers to restore and conserve wetlands, with funding linked to the duration of the commitment. From 1992-2013, approximately 1.1 million hectares were enrolled in the program, with investment of $4.5 billion.
20. A rangeland restoration project in South Africa, funded by the Global Environment Facility, has benefits for the Mnisi community adjacent to Kruger National Park as well as wildlife. The Mnisi community depend upon raising livestock for their livelihood. As part of this restoration project, funds are invested in improving grazing conditions. This increases income and the likelihood that cattle farmers will become engaged conservation partners who help prevent wildlife crime. As a Mnisi elder stated, “Help look after our cattle and we’ll help look after the rhinos.”[[64]](#footnote-64)
21. Research indicates that given sufficient land, traditional shifting cultivation is sustainable; traditional fire management often benefits biodiversity; and that many customary fishery systems limit harvest levels and impacts. These customary systems could inform practices on a wider scale, improving ecosystem health and conserving biodiversity.[[65]](#footnote-65)
22. Indigenous guardians protect culture, biodiversity and food security. In Australia and Canada, Indigenous peoples are regaining their traditional stewardship responsibilities over large areas of land as a result of modern reconciliation processes. For thousands of years their cultures have developed diverse and sustainable ways to feed their communities from the wealth of the land and the water without undermining the health and productivity of these ecosystems.[[66]](#footnote-66)
23. Norway’s Svalbard Global Seed Vault hosts approximately 1 million seed samples in an extraordinary project intended to conserve global seed diversity and protect food security.

 VI. Reducing Greenhouse Gas Emissions and Protecting Carbon Sinks

1. Climate-Smart Agriculture (CSA) involves a suite of innovative and effective approaches to land, soil and water management that sequester carbon and reduce GHG emissions. CSA practices help to retain soil structure, organic matter and moisture under drier conditions, and include agronomic techniques (including irrigation and drainage) to adjust or extend cropping calendars to adapt to seasonal and interannual climate shifts. Water efficiency measures in agriculture can reduce the energy needed for pumping, in turn further reducing the water needed for energy production. Increased use of renewable energy in agriculture (e.g. solar photovoltaic pumps) provides additional opportunities to lower GHG emissions and to support the livelihoods of smallholders. Since agriculture accounts for 70 percent of global water withdrawals, reducing food loss and waste could also have significant repercussions on water and energy demand, thereby reducing GHG emissions. The biomass and soils of properly managed forests, wetlands and grasslands provide mitigation opportunities through carbon sequestration, with significant additional benefits in terms of nutrient cycling and biodiversity.
2. Many States continue to subsidize fossil fuel use, including in the agriculture and fisheries sectors, despite repeated pledges to phase out these perverse subsidies. Austria and the Netherlands deserve praise for phasing out fuel tax concessions for farmers.[[67]](#footnote-67)
3. In cooperation with the World Food Programme and local communities, Egypt developed a system to provide early warnings about extreme weather events. In 2016 and 2017, this early warning system helped farmers of wheat, sorghum and maize reduce their losses from heatwaves by around 70 percent. Early Warning, Early Action systems have also been used effectively in Ethiopia, Kenya and Somalia.
4. The R4 Rural Resilience Initiative, launched by the World Food Programme and Oxfam in 2011, offers an integrated package of gender-responsive financial services and community assets to address climate variability and extreme weather. The initiative has demonstrated positive impacts, including productivity gains and reduced food shortages, in Ethiopia, Malawi, Senegal and Zambia. In Eswatini, the Lower Usuthu Smallholder Irrigation Project promotes sustainable and climate-smart agriculture that anticipates changing climatic conditions.
5. In Bangladesh, the Coastal Climate Resilient Infrastructure Project (CCRIP) was designed to improve the resilience of the food system by investing in flood-resilient roads and infrastructure, community markets, and climate preparedness capacity. A core focus to achieve these aims was women empowerment and inclusion through community infrastructure development. Over 5.7 million people benefitted from the infrastructure and training supported by CCRIP, with a particular focus on women. Cumulatively, 750 km of roads and 5,315 m of bridges and culverts were constructed. A total 184 community markets and 178 market facilities for processing or storage were constructed or rehabilitated, increasing access to market, sales, and food security.
6. UN-Women has an initiative called Women’s Empowerment through Climate-Smart Agriculture. Ireland promotes gender equality in developing climate-resilient agriculture.
7. China and New Zealand co-lead the Nature-Based Solutions Coalition to promote actions that provide multiple benefits in protecting ecosystems and biodiversity, addressing climate change (both mitigation and adaptation), and preventing the degradation of land and water or restoring nature. More than 70 States support this initiative, committing to: increasing and mainstreaming nature-based solutions within national governance, climate action and climate policy-related instruments; promoting and leveraging finance for nature-based solutions; scaling-up nature-based solutions for mitigation, resilience and adaptation in key areas, including sustainable food systems; the conservation and restoration of forests, other terrestrial ecosystems, freshwater and marine ecosystems; optimizing nature’s contribution to resilient livelihoods, green infrastructure, sustainable settlements and just rural transitions; and enhancing regional and international co-operation.[[68]](#footnote-68)
8. In 2014, Jamaica was hit with a devastating drought, which led to a 30% drop in agricultural production at a cost approaching nearly one billion dollars. Farmers have adapted by adopting new and sustainable farming practices, such as high efficiency irrigation and water harvesting systems, to maintain their crops even during persistent periods of drought.
9. El Salvador’s RECLIMA project seeks to increase farmers’ resilience to climate change in the agroecosystems of that State’s dry corridor with partners including the FAO, the Green Climate Fund and the Initiative for the Americas Fund. The first part of the initiative, involving farmers in 114 communities, strives for continuous improvement of soil and water agricultural practices to achieve sustainable management and economic development. The project, with a budget of $US 127.7 million, is expected to benefit 225,000 people, 20,000 of whom belong to indigenous communities.[[69]](#footnote-69)
10. Costa Rica’s National Decarbonization Plan aims to achieve net zero emissions by 2050 through transformations in all sectors, including agriculture and forestry.[[70]](#footnote-70) This ambitious plan is based on the principles of inclusion, respect for human rights and gender equality. Related Costa Rican initiatives include green tax reform; continued expansion of forest area; and the implementation of farming practices that reduce emissions.
11. The Rural Insurance Premium Subsidy Program (PSR), implemented since 2004 in Brazil, supports rural producers who wish to protect their crops against climate risks, through an economic subsidy granted by the Federal Government to co-finance the payment of insurance premiums for agricultural producers, and thus expand the coverage of private insurance. This is an adaptation and risk management measure that seeks to reduce the vulnerability of agriculture, as it grants economic support to farmers in the event of a climatic event that affects crop yields.
12. Peru’s *Emergency Decree establishing extraordinary measures for the revitalization of agricultural and fishing production (No. 7 of 2017)* establishes fiscal measures of a temporary and urgent nature to grant liquidity and financial services to agricultural producers impacted by severe climatic conditions (in addition to broader support to reintegrate rural populations affected by natural disasters back into productive economic sectors).
13. With Canadian funding, Cameroon implemented a project called “Eco-Agricultural Business for the Adaptation to Changes in Climate” that offered training in innovative and sustainable farming practices, encouraged social enterprises, and provided financial incentives. The project succeeded in reaching some 2,000 poor and vulnerable smallholder farmers who adopted green technologies such as bio-fertilizers that improved their incomes and livelihoods while reducing impacts on forests and reducing the vulnerability of rural communities to climate change. The proportion of households struggling to meet food needs dropped from 22% to 3% over the life of the project while the proportion of households having sufficient food or food surpluses for the entire year rose from 38% to 78%.[[71]](#footnote-71)
14. Benin is developing four biomass power plants with a combined capacity of 4MW that will generate electricity by burning agricultural waste. Supported by the Global Environment Facility’s Least Developed Countries Fund and UNDP, the project also involves developing sustainable management practices for 100,000 hectares of wood-supplying zones and providing 10,000 poor families with improved cookstoves.[[72]](#footnote-72)
15. Guinea is attempting to reduce GHG emissions from agriculture by encouraging the use of biogas in rural areas to limit the abusive cutting of firewood and cooking wood, improving wildfire management, and educating producers about climate-sensitive animal husbandry practices.[[73]](#footnote-73)
16. Côte d’Ivoire has started using fuel briquettes from rice husks (the hard covering of the grains) which has benefits for waste management, forests, climate change and air pollution.
17. Syria is attempting to reduce greenhouse gas emissions from agriculture through crop rotations, using agricultural waste to produce energy, rehabilitating degraded lands, and shifting to renewable energy.[[74]](#footnote-74)
18. It is now well-established that eating a predominantly or entirely plant-based diet has substantial benefits for both the environment and human health, although this may not be possible or desirable in specific cultural and socio-economic contexts (e.g. the traditional diets of many Indigenous communities include meat and fish).[[75]](#footnote-75) The industrial production of meat, particularly beef, causes a disproportionate share of agriculture’s high levels of greenhouse gas emissions, water pollution, air pollution and contribution to biodiversity loss.[[76]](#footnote-76) Crops that are high in protein (e.g. soybeans, lentils and chickpeas) can provide extensive benefits, such as improved nitrogen management, lower nitrogen emissions and increased opportunities for farmers. In 2015, Ireland introduced a programme offering incentives to farmers to grow protein crops. In the first year of the programme, a 300 per cent increase in production was reported.[[77]](#footnote-77)

 VII. Reducing the Use of Pesticides, Synthetic Fertilizers and Antibiotics

1. Public policies and education can address the problems caused by reliance on harmful pesticides, synthetic fertilizers and antibiotics. Sweden, Norway, Denmark, Finland, France and Italy impose taxes on pesticides. Sweden reduced pesticide use by over 80 percent since 1980 by charging a special tax on pesticides, offering economic support for organic agriculture, funding research on alternatives to pesticide use, and providing mandatory education programs for pesticide users to assist them in reducing their reliance on these chemicals. Norway’s pesticide tax is noteworthy for being one of the first to apply higher tax rates to products of higher toxicity.
2. France has prohibited the use of all neonicotinoid pesticides, meaning that acetamiprid, clothianidin, imidacloprid, thiacloprid, and thiamethoxam can no longer be used on crops grown in field or greenhouses.[[78]](#footnote-78) According to the UN Food and Agriculture Organization, 71 percent of 100 crop species (which provide 90 per cent of global food), are pollinated by bees.[[79]](#footnote-79) In 2018, a law was passed in France prohibiting the production, storage, and marketing of pesticide products containing active ingredients that are not approved in the European Union because of concerns about adverse effects on human, animal or environmental health (Law no. 2018-938). Attempts by the chemical industry to overturn the law were rejected by the Constitutional Court in 2019, so that the law will enter into force in 2022.
3. During the 1980s, Indonesia adopted an IPM policy and introduced strong regulation of pesticide use, leading to a decline of two-thirds in the country’s pesticide imports.[[80]](#footnote-80)
4. The Province of Almería in southeastern Spain has one of the world’s largest horticultural areas. Globally, it is one of the locations where integrated pest management (IPM) is most widely applied. In 2013, pests were regulated using biological control on 27,000 ha (75 percent of the total area). In 2016, 10,000 ha of peppers (nearly 100 percent of the total), 9,500 ha of tomatoes (more than 80 percent), 3,500 ha of cucumbers and substantial areas of zucchini, eggplant, melon and green beans, among other crops, were managed under biological control practices. IPM is also important in the citrus and grape sectors.[[81]](#footnote-81)
5. In 2020, in an unprecedented court decision, a farmer, a pilot and a contractor for sprayers in Brazil were ordered to pay approximately 31,700 euros in compensation. They had been spraying pesticides from the air. As a result, they will have to pay the money to the Indigenous community of Tey’i Jusu (in the administrative district of the same name).
6. Field schools for farmers can significantly reduce pesticide use, as inputs are replaced by knowledge. Large-scale studies conducted in Bangladesh, Indonesia and Viet Nam showed decreases of 34 to 92 per cent in pesticides used on rice crops.[[82]](#footnote-82)
7. Sierra Mixe maize is a variety of corn grown in Mexico that fixes (extracts) nitrogen from the air, enabling the plants to grow in low quality soil without chemical fertilizer. This particular variety is one of more than 23,000 genetically distinct maize varieties grown in Mexico, which highlights the importance of maintaining the full diversity of native plant species.
8. As one of the 156 UN Member States that recognize the right to a safe, clean, healthy and sustainable environment, El Salvador developed different actions to reduce the environmental impacts generated by unsustainable food production, including the following actions carried out by the Ministry of Agriculture and Livestock to reduce the effects of pesticides and fertilizers:

 (a) Regulation and monitoring of the proper use of pesticides and the implementation of good agricultural practices.

 (b) Verification of the registration of pesticides and prioritization of those with selective use and low toxicity and definition of measures for their storage and safety.

 (c) Development of standards and regulations at the national and regional levels to regulate and encourage the importation, formulation and use of pesticides that are safe for human health and the environment.

 (d) Prohibition of the use of highly hazardous pesticides

 (e) Nationwide use of a pilot project for the use of biofertilizers to reduce synthetic fertilizer use.

 (f) Conducting a study of the state of soil fertility in the country, to prioritize the use of chemical fertilizers where they are necessary.

 (g) Implementation of agroforestry crops in order to reduce the use of agrochemicals.[[83]](#footnote-83)

1. In Viet Nam, policy makers recognized the potential flaws of fertilizer subsidies and introduced compensatory measures. Under this policy, which is known as the 'five reductions, one must' policy, farmers are encouraged to use rice varieties with clear origin, pure breed and guaranteed quality ('one must'). The 'five reductions' are: the reduction of the number of seeds planted per unit; the reduction of the amount of water used (at certain times); the reduction of the amount of fertilizer applied; the reduction of the amount of pesticides applied; and the reduction of post-harvest losses. Under this policy, the use of chemical fertilizers, pesticides, labour and water declined from earlier levels, while farmers earned higher incomes from rice production.[[84]](#footnote-84)
2. The European Union’s Farm to Fork Strategy contains a number of concrete targets that the EU aims to reach by 2030:

 (a) Pesticides in agriculture contributes to pollution of soil, water and air. The Commission will take action to reduce the use and risk of chemical and more hazardous pesticides by 50%.

 (b) The excess of nutrients in the environment is a major source of air, soil and water pollution, negatively impacting biodiversity and climate. The Commission will act to reduce nutrient losses by at least 50%, while ensuring no deterioration on soil fertility reduce fertilizer use by at least 20%.

 (c) Antimicrobial resistance linked to the use of antimicrobials in animal and human health leads to an estimated 33,000 human deaths in the EU each year. The Commission will reduce the sale of antimicrobials for farmed animals and in aquaculture by 50%.

 (d) Organic farming is an environmentally-friendly practice that needs to be further developed. The Commission will help the EU’s organic farming sector to grow, with the goal of 25 % of total farmland being used for organic farming by 2030.

1. A systemic approach to preventing agricultural water pollution was adopted by the European Union in the *Nitrate Directive* (1991) and the *Water Framework Directive* (2000). These reduced the volume of nitrogen fertilizer use by 19% during the period 1990–2010, resulting in improved water quality.[[85]](#footnote-85)

 VIII. Reducing the Risks of Pandemics of Zoonotic Origin

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1. Malaysia used land-use policies to prevent further outbreaks of Nipah virus after suffering an initial outbreak in 1998. Nipah virus is transmitted from bats to pigs and from pigs it spilled over into humans, with a high mortality rate. Deforestation pushed bats into closer proximity with farms. The government policies required farmers to take steps to separate bats and pigs, and there have been no outbreaks since 1998.[[86]](#footnote-86)

 IX. Sustainable Fisheries

1. The Pescado Azul (Blue Fish) Women’s Association of Isabela in the Galapagos (Ecuador) promotes responsible fishing by empowering local women. The association emphasizes traditional knowledge and the conservation and sustainable use of marine resources. Illegal and unsustainable fishing in local coastal waters has led to the overexploitation of sea cucumbers, spiny lobsters and a variety of fish species. To reduce pressures on these species, Pescado Azul promotes alternative livelihood opportunities. The main focus has been on developing value-added smoked products from sustainably sourced yellowfin tuna. Wood from guava shrubs, an invasive species, is used to smoke the fish. Products are marketed under the Pescado Azul brand, and the association has developed links with ecotourism operators to help identify markets. Other activities have included reforestation of local mangroves and efforts to promote ecological awareness.[[87]](#footnote-87)
2. Concerned by falling fish populations, local communities in Mangagoulack, Senegal, created the Association of Fishermen of the Rural Community Mangagoulack and established a community conservation area named Kawawana. The name derives from the Djola expression “Kapooye Wafolal Wata Nanang”, which means “our patrimony, for us all to preserve.” The conservation area was demarcated and rules put in place to control access to the coastal waters and combat the use of destructive fishing methods. In 2010, the Association obtained legal management rights for Kawawana, including a preferential right to fish on the local coast. Mangagoulack is the first local community in Senegal to obtain devolved management rights for coastal fisheries. The waters of the conserved area are divided into red, orange and yellow zones. No fishing or collection of shells or wood is permitted in the red zone, which includes mangroves and inlets that provide habitat for dolphins, manatees, fish and shellfish. The orange zone is reserved for fishing that supplies local consumption and markets. The yellow area is open to fishing, but subject to restrictions on the fishing methods and gear that can be used. The new management system rapidly increased fish populations and improved the local diet. Three years after the creation of the conservation area, local fishermen’s catches had doubled.[[88]](#footnote-88)
3. South Africa adopted a small-scale fisheries policy in 2012, focusing on collective rights to improve the livelihoods of fishers and fishing communities. The policy establishes preferential fishing zones for small-scale fishers, where large-scale commercial fishing is not allowed. The policy also enables the establishment of community-based legal entities, through which fishing communities can manage fishing and related activities in a way that respects the rights of small-scale fishers and protects marine ecosystems.[[89]](#footnote-89)
4. Indonesia and Liberia cracked down on illegal, unreported and unregulated fishing by stepping up enforcement actions, which had both conservation benefits (reduced fishing pressure) and socio-economic benefits (by re-allocating catch to the local fishing fleet).[[90]](#footnote-90) The Gambia reported similar benefits after banning all industrial offshore fishing.
5. Confronted by declining fish stocks and deforestation, Indigenous communities in Sabah, Malaysia revived their traditional governance and management system called the Tagal Hutan, which involves collective ownership and responsibility for the sustainable use of nature both on land and in water. Tagal means prohibition in the Kadazan language, while hutan means forest in Bahasa Malaysia. One element of the Tagal system is that communities stop harvesting certain fish species for a pre-agreed period, especially during fish breeding seasons, in an effort to prevent fish populations from crashing or becoming extirpated. This system has been so successful that the Sabah Fisheries Department formally recognized it under the Sabah Inland Fisheries and Aquaculture Enactment 2003.[[91]](#footnote-91)
6. Fiji released its National Ocean Policy laying out its commitment to 100% sustainable management of national waters and its designation of 30% marine protected areas by 2030.
7. In the Philippines, a network has been created that grants fishing communities clear, exclusive rights to fish in certain areas. In communities that organised to manage ‘their’ fishing areas and protected zones, boats and fishers are registered, the catch is recorded, regulations are respected and fishers participate in management. By embracing sustainability, participating communities increased their food and financial security and gained access to new markets and sources of capital—improving their own well-being while protecting the ocean.
8. Mexico created a Marine Protected Area at Cabo Pulmo is response to demands by local fishers, who had witnessed a dramatic decline in fish populations. Just ten years after the creation of this protected area, an underwater desert had been transformed into a kaleidoscope of life and color. The total fish biomass in the reserve increased by more than 460% and large predators like groupers, sharks and jacks returned. Nature’s recovery led to a profitable diving tourism industry within the reserve, while local fishers in surrounding areas reaped the benefits of a healthier, more sustainable marine ecosystem.[[92]](#footnote-92)
9. Empowering fishers by granting them access rights in exchange for sustainably managing their resource is one of the levers of the sustainable ocean economy. Doing so has already proved effective. In the territorial use rights fisheries (TURFs) that Chile created, for example, catches by artisanal fisheries have surpassed industrial catches, and the biomass and size of the target species has risen. Similar approaches have met with great success in many fisheries, recovering depleted fisheries and enabling them to thrive.[[93]](#footnote-93)
10. Sixteen States already have protected at least 25 per cent of their marine territory: Australia, Belgium, Brazil, Chile, France, Gabon, Germany, Jordan, Lithuania, Monaco, the Netherlands, New Zealand, Palau, Slovenia, the United Kingdom and the United States of America. Evidence is clear that marine protected areas contribute to the regeneration of fish populations.[[94]](#footnote-94)

 X. Healthy and Sustainable Diets

1. The European Union’s Farm to Fork Strategy is a comprehensive approach to how Europeans value food sustainability. It is an opportunity to improve lifestyles, health, and the environment. The creation of a favourable food environment that makes it easier to choose healthy and sustainable diets will benefit consumers’ health and quality of life, and reduce health-related costs for society. The Strategy aims to reward farmers, fishers and other operators in the food chain who have already undergone the transition to sustainable practices, enable the transition for others, and create additional business opportunities.[[95]](#footnote-95) The Code of Conduct for Responsible Business and Marketing Practices is one of the first deliverables of the Farm to Fork Strategy and an integral part of its action plan. It will set out the actions that the actors ‘between the farm and the fork’, such as food processors, food service operators and retailers, can voluntarily commit to undertake to tangibly improve and communicate their sustainability performance. Other actions under the Farm to Fork Strategy relate to procurement rules, food labels, marketing standards, and reduction of food waste. It builds on earlier policy instruments, laws and regulations such as the General Food Law[[96]](#footnote-96), the Common Agricultural Policy[[97]](#footnote-97), the Common Fisheries Policy[[98]](#footnote-98) and all of the EU environment acquis.
2. Brazil, Germany, Qatar and Sweden are countries that have led the way in establishing dietary guidelines that integrate health, nutrition and environmental sustainability. Brazil’s ‘Dietary Guidelines for the Brazilian Population 2014’ incorporate references to soil conservation, pesticides, conservation of forests and biodiversity, and the amount of water and energy consumed to produce different foods.[[99]](#footnote-99) States, municipalities and federal schools in Brazil are required to purchase at least 30 percent of food for school meals directly from smallholder producers.
3. National, provincial or state laws should require government procurement of healthy, local and sustainable food products. In Canada, the Ontario Local Food Act is a good example, as it aims to reduce administrative barriers to the use of local food by public-sector organizations, making it easier for colleges, universities, hospitals and municipalities, to gain access to local food.[[100]](#footnote-100)
4. In 2018, the WHO called for the global elimination of trans fats. Bans or severe restrictions are in place in Argentina, Canada, Chile, Colombia, Denmark, Ecuador, Peru, Switzerland, United Kingdom, United States of America and Uruguay.
5. The European Commission will propose harmonised mandatory front-of-pack nutrition labelling and will consider extending mandatory origin or provenance information requirements for certain products.
6. Food policy councils provide important opportunities for citizens to influence food system outcomes through civic engagement. Individuals need education and available information to enable them to be active food citizens capable of making conscientious choices that can have local and global influence. For example, the Italian city of Milan introduced the Milan urban food policy pact that was signed by more than 100 cities in 2015.

 XI. Reducing Food Loss and Waste

1. France’s *Law on the fight against food waste (No. 2016-138)* establishes a hierarchy of actions to be taken by each actor in the food chain, in descending order: prevent waste; use unsold food for human consumption; use unsold food for animal feed; and use unsold food for composting and energy recovery. The Law also targets training and education for children in schools by requiring information to be disseminated on food waste. Addressing food waste is also to be integrated into sustainability initiatives undertaken by businesses.
2. Italy’s *Law on the donation and distribution of food and pharmaceutical products for purposes of social* solidarity *and food waste prevention (No. 166 of 2016)*, as the title suggests, seeks to reduce waste for each phase of the food system, including production, transformation, distribution and consumption. Its objectives are to: encourage the recovery and the donation of food surpluses for social solidarity purposes, earmarking them as a priority for human use; limit negative impacts on the environment and natural resources through actions targeting reduction of waste and promoting recycling; meet the goals of the Food Waste Programme and National Plan that works towards reducing the quantity of biodegradable waste sent to landfill disposal; and contribute to the research, information and sensitization of consumers and institutions on food waste. This Law encourages the donation of food to charities rather than throwing food away and establishes a hierarchy of priorities giving primacy to reuse for human consumption. Italy is taking many other actions to reduce food waste including a national communications campaign, research, a national food waste prevention day, and a national contest where the best initiatives against food waste are shared and rewarded. Prizes are awarded in ten categories including: Companies; Schools; Public agencies; Citizens and associations; Innovation; Mediterranean diet; Biodiversity; Literary essays; Horticultural production; and Sustainable transport and mobility.[[101]](#footnote-101)
3. The European Commission aims to cut food waste by half by proposing legally binding targets across the EU by 2023. This is part of a broader effort to accelerate the transition towards sustainable food consumption and ensure that all foods placed on the EU market become sustainable. The European Commission is preparing a legislative initiative on sustainable corporate governance that would introduce mandatory human rights and environmental due diligence across supply chains.[[102]](#footnote-102)
4. It must be noted that many civil society organizations have genuine concerns about using food waste to feed the poor. For example, the Global Solidarity Alliance for Food, Health and Social Justice argues that “Advancing policies that support the growth and institutionalization of food banking infrastructure reinforces the power of large profit-driven actors in the food system, while eroding public interventions, democratic decision making and transparency that are necessary to ensure the human right to food for all.”[[103]](#footnote-103)

 XII. Systemic and Transformative Changes

1. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services and the Intergovernmental Panel on Climate Change both concluded that rapid, systemic and transformative changes are needed to address the global environmental crisis and achieve the Sustainable Development Goals by 2030. Changes are required across almost every sector of society, implicating not only human rights law, but also laws and policies governing environmental protection, energy, natural resources, agriculture, trade, investment, corporations, taxes, banking, construction, transport, and land-use. The Special Rapporteur endorses the following potentially transformative ideas, each of which has precedents that confirm their viability.
2. Demilitarization offers extraordinary potential for reducing conflict, promoting peace, and freeing up vast resources for other societal priorities. Costa Rica is the world’s leading example, having disbanded its military in 1948. Costa Rica invested the savings in education and health care with compelling results, as the country enjoys high literacy rates, long life expectancy, a modern economy, an excellent environmental record, and a very happy population.
3. Children and youth around the world are expressing grave concern about the impacts of climate change upon their future. The minimum voting age should be lowered to 16 years or lower to enable youth to participate in and influence the political system, which is to integral to shaping the world they will inherit. The voting age has already been lowered to 16 in a number of nations including Argentina, Austria, Ecuador, Estonia, and Scotland. Youth Parliaments are also a powerful tool for amplifying the voices and concerns of young people, with inspiring examples from Guyana and Scotland.
4. In addition to shifting from fossil fuels to renewable energy, the world needs to shift away from today’s linear economy, based on extracting resources from nature, manufacturing products, and then throwing away garbage, generating waste and pollution at each stage. The sustainable alternative is a circular economy, where everything we make or use is either reusable, recyclable or safely compostable. Inspired by the genius of natural ecosystems, a circular economy uses smart design to eliminate waste and pollution. Thousands of products, from office chairs to solar panels, have already been redesigned to meet circular economy criteria. Businesses have an important role to play, but government policy is the key to accelerating the shift. Circular economy laws have been enacted by the European Union, China, Japan, and Ontario (Canada). An important example is a new EU policy banning many single-use plastics, creating recyclability and recycled content requirements for other plastic products, and making producers responsible for funding and operating recycling and clean-up programs.
5. The relentless pursuit of economic growth (measured by increases in gross domestic product or GDP) has inflicted grievous harm upon the planet whose health is vital to the future for humans and all other species. It is time to for society to rethink its objectives. Several States with large Indigenous populations (e.g. Bolivia, Ecuador) embrace the goal of “sumak kawsay,” “buen vivir” or a good life lived in harmony with nature. Bhutan strives to maximize gross national happiness, which is comprised of four pillars: good governance, sustainable socio-economic development, cultural preservation and environmental conservation.
6. Modern corporations, with their legal imperative to maximize shareholder value, are major contributors to biodiversity loss and climate change. Too often, shareholders’ interests are prioritized over the public interest, human rights, and the environment. In recent years, a superior alternative has emerged, called a benefit corporation or community interest corporation. Benefit corporations are for-profit enterprises that must make “a material positive impact on society.”[[104]](#footnote-104) These enterprises must achieve higher standards of transparency, accountability, and performance. Regulations governing benefit corporations expand the duties of directors to require consideration of non-financial stakeholders and mandate reporting on social and environmental performance using credible and independent third-party standards.[[105]](#footnote-105)

 XIII. Conclusion

1. **This annex to the report *Healthy and Sustainable Food: Reducing the Environmental Impacts of Food Systems on Human Rights* summarizes many good practices related to ensuring healthy and sustainable food, a key element of the human right to a safe, clean, healthy and sustainable environment.A remarkably diverse array of actions can contribute to reducing greenhouse gas emissions, increasing carbon sinks, decreasing the use of pesticides, synthetic fertilizers and antibiotics, restoring soil quality, improving air and water quality, alleviating water scarcity, decreasing the risks of zoonotic diseases, and restoring/protecting biodiversity and ecosystems. Among the key actions are** laws**, policies, programs and other measures that promote agroecology, agroforestry, sustainable fisheries, and healthy diets, as well as recognizing the land rights of Indigenous peoples, peasants, and local communities. The most important beneficiaries of the good practices highlighted in this annex are the individuals and communities who are most vulnerable to violations of their rights to food and a safe, clean, healthy, and sustainable environment.**
2. **The Special Rapporteur hopes that these concrete examples of good practices will inspire States to accelerate their efforts to recognize, respect, protect and fulfil all of the inter-connected elements of the right to a safe, clean, healthy and sustainable environment,** including **healthy, sustainable food, clean air, safe and sufficient water, a safe climate, healthy ecosystems and biodiversity, and non-toxic environments where people can live, work, study and play.**
3. **The adoption of a resolution recognizing the right to a safe, clean, healthy and sustainable environment would be a positive catalyst to accelerate efforts to ensure the enjoyment of this right. Indeed, this was precisely the effect witnessed in many States following the adoption in 2010 of resolutions on the rights to water and sanitation by the General Assembly (64/292) and the Human Rights Council (15/9). A rights-based approach is not only helpful but essential to stimulating the many urgent actions needed to achieve the** Sustainable **Development Goals as outlined in the 2030 Agenda for Sustainable Development.**
4. **Ultimately, however, it must be emphasized that humanity faces a daunting and unprecedented global environmental crisis involving the climate emergency, the collapse of biodiversity, pervasive air and water pollution, and a rising number of emerging infectious diseases of zoonotic origin. Despite the many good practices featured in this report, they are not nearly enough. The health and environmental externalities of today’s industrial food system are measured in the tens of trillions of dollars annually. There is much, much more work to be done to transform today’s unjust and unsustainable society into an ecological civilization where everyone eats healthy and sustainably produced food, breathes clean air, drinks safe water, appreciates the diversity and abundance of wild species, enjoys a safe climate and a non-toxic environment, and lives in harmony with nature.**
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