



Policy and legal enabling conditions for sustainable agriculture

A multi-level comparative approach

Ian Hannam, Enrico Mezzacapo, Jose Luis Chicoma

Barbara Lausche, editor



COMMON GROUND ON FOOD AND AGRICULTURAL SYSTEMS SERIES NO. 4



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Foreword

Agriculture has been a cornerstone of human civilisation, shaping societies, economies, and landscapes for millennia. While advances in agricultural practices and science have enabled remarkable increases in food production, they have also contributed to environmental degradation, biodiversity loss, soil and water pollution. These challenges are compounded by growing global populations, intensifying production and consumption patterns, and the escalating impacts of climate change. Meeting the world's food security needs in a cost-effective, environmentally sound, and socially equitable manner has therefore become an urgent global priority.

There is now a pressing need to accelerate the transition towards sustainable food and agricultural systems and to develop or strengthen policy and legal frameworks that support this transformation. Sustainable agriculture, although defined in various manners, broadly encompasses the three pillars of sustainable development - environmental, social, and economic - aiming to manage and conserve natural resources while ensuring the fulfilment of human needs for present and future generations. Its diverse approaches include, among others, agroecology, nature-inclusive agriculture, permaculture, biodynamic farming, organic agriculture, conservation agriculture, and regenerative agriculture.

The evolution of sustainable food and agricultural systems reflect both the urgency of environmental challenges and the diversity of approaches available. Global conventions, regional agreements, international organisations, and national policies increasingly recognise the importance of promoting sustainability, ranging from incremental approaches, such as sustainable intensification, to transformative strategies like agroecology. The Rio Conventions,

particularly the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD), present important opportunities to integrate sustainable agriculture into national policy and legal frameworks, leveraging binding commitments, review mechanisms, and political momentum.

Trade rules and agreements, while offering potential pathways for promoting sustainable practices, often face significant obstacles. Global frameworks, such as the WTO Agreement on Agriculture, have been criticised for perpetuating inequities and failing to advance sustainability objectives. Some regional efforts, such as the European Union's trade agreements and deforestation-free product regulations, demonstrate progress in linking sustainability standards with trade. Similarly, national policies, such as the EU's Common Agricultural Policy, illustrate the dynamic evolution of technical advice and guidance, emphasising the need for adaptive and flexible legal frameworks capable of responding to environmental, social, and economic uncertainties.

Policy and legal support for sustainable agriculture requires a comprehensive, multi-sectoral approach. This includes redirecting subsidies from conventional agriculture to sustainable practices, fostering research on diversified and resilient systems, and leveraging instruments, such as public procurement programmes, to create stable markets for sustainably produced food.

Success in implementing sustainable agriculture depends on robust political will, evidence-based policy, local adaptation, and inclusive stakeholder participation, as demonstrated by the case studies from Brazil, Germany, Kyrgyzstan, Uganda, and Viet Nam.



The link between sustainable agriculture and broader environmental governance is also critical. Effective environmental governance underpins public health, ecosystem integrity, and long-term development. As the production and management of agricultural and other waste streams grow increasingly complex, coherent policy frameworks, robust regulatory enforcement, and effective institutional coordination become essential. Integrating legal and policy measures across sectors, including environment, land rights, health, gender, labour, economy, and trade, ensures that agriculture contributes to sustainable development while minimising ecological harm.

Against this backdrop, this publication serves as a strategic implementation roadmap to guide policymakers, regulators, and practitioners to strengthen sustainable agriculture and environmental management. It translates

international commitments and legal principles into practical, actionable pathways, fostering coordination among stakeholders and supporting adaptive governance. By doing so, it provides a valuable reference for advancing long-term sustainability, protecting ecosystems, and enhancing the livelihoods of communities dependent on agriculture.

The Centre for Environmental Policy and Law (CPL) is proud to present this paper and roadmap, reaffirming the critical importance of coherent policies, effective legislation, and collaborative action to achieve sustainable agriculture and environmental stewardship for present and future generations.

Sonia Pena Moreno
Director
Centre for Policy and Law



Executive summary

The dominant model for agricultural development has not adequately considered environmental and social externalities, leading to their insufficient integration into decision-making processes that shape agriculture and food systems. There is a critical need for comprehensive regulation of the agricultural sector to design and implement concrete transition pathways towards more sustainable agriculture and food systems at various scales, from local farms to national, regional, and global levels.

The purpose of this report is to identify and assess key areas of law and policy that require renewed attention to support the development and implementation of sustainable agriculture, particularly at the national level. The assessment spans international law and policy, regional instruments, and necessary updates to national laws and policies to enable, support, and effectively implement sustainable agriculture programmes over the long term. It encompasses key areas such as biodiversity conservation, climate change adaptation and mitigation, land use planning, environmental regulations, and farmer support, to understand the importance of sustainable agriculture and adopt innovative practices.

Sustainable agriculture has been defined in various ways. Although there is no consensus on its definition, it is considered to include the three central pillars of sustainable development: environmental, social, and economic, to promote – according to the FAO definition – the “management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for

present and future generations.” (FAO, 2014a, p. 12). This allows for a wide range of approaches to sustainable agriculture in policy and legislative frameworks, such as agroecology, nature-inclusive agriculture, permaculture, biodynamic agriculture, organic farming, conservation agriculture, regenerative agriculture, among others.

The **main audiences for this report** include policymakers and government officials, particularly in developing countries, environmental NGOs, advocacy groups, and stakeholders in the agricultural sector, including the IUCN Secretariat and its members. It also aims to engage legal scholars, academic institutions, and international organisations, especially those working on climate change mitigation in both the agricultural and related food sectors, environmental restoration of natural resources (land, air, water), and addressing social and economic challenges for rural agricultural livelihoods. Finally, the report adopts a non-technical style to engage a diverse range of stakeholders.

Part 1 explores the multi-dimensional aspects of key international environmental law and policy instruments that directly or indirectly promote sustainable agriculture. It starts with major legally binding instruments related to biodiversity, climate change, desertification, wetlands, and migratory species, all of which involve commitments essential for guiding and supporting sustainable agriculture. This is followed by an analysis of major non-legally binding instruments that set policy targets and principles independent of a particular convention, including specific guidance for agriculture. This includes the UN Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction, and Codex Alimentarius.



Both categories define objectives and set out obligations or guidance important to consider in national policy and law frameworks supporting sustainable agriculture.

The international legally binding instruments, particularly the Rio Conventions – UNFCCC, CBD, and UNCCD – provide significant opportunities for promoting sustainable agriculture. These conventions have increasingly incorporated sustainable agricultural practices in response to the urgent global focus on climate change and environmental challenges. Their periodic review processes allow for the continual adaptation and improvement of strategies to better support sustainable agriculture. Notably, **the Global Biodiversity Framework (GBF)** outlines an ambitious pathway for 2050, emphasising sustainable agricultural management through practices like agroecology, supported by National Biodiversity Strategies and Action Plans (NBSAPs) and a detailed monitoring framework. These elements are crucial for shaping national sustainable agriculture policies.

The Paris Agreement also plays a pivotal role in promoting sustainable agriculture through mitigation and adaptation commitments outlined in Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). These instruments' periodic review processes of these instruments enable countries to raise their ambitions and address emerging issues, ensuring that agricultural practices remain resilient and sustainable. The increased focus on the link between sustainable agriculture, food systems, and climate action is expected to drive more decisive actions from countries and secure additional funding for those most in need. Conversely, the commitments related to desertification under the UNCCD are more limited compared to the previous conventions, as they specifically address desertification and the effects of drought, excluding other climatic regions that also experience land degradation processes.

Complementing these efforts are the Ramsar Convention on Wetlands and the Convention on Migratory Species, which underscore the role of sustainable agriculture in conserving critical ecosystems and species. These conventions create specific obligations for Parties to protect wetlands and migratory species, respectively, where sustainable agricultural practices play a vital conservation role.

Beyond these binding international law instruments, significant international policy frameworks provide complementary guidance. The **UN Sustainable Development Goals (SDGs)** provide a comprehensive policy framework for aligning agricultural development with broader sustainable development objectives, although their non-binding nature and slower review process present implementation challenges. Additionally, other international policy instruments like the **Sendai Framework for Disaster Risk Reduction and the Codex Alimentarius** provide important guidelines that support sustainable agriculture by promoting resilience and good agricultural practices, respectively. Together, these binding legal instruments and voluntary policy frameworks highlight the multi-faceted approach required to advance sustainable agriculture at global, regional, and national levels.

Part 2 focuses on key international institutions with mandates or initiatives related to sustainable agriculture, providing essential guidance, standards, and best practices. These institutions play crucial roles in helping countries develop and update their national law and policy frameworks. They are involved in creating standards, formulating policies and strategies, building capacity, monitoring global and regional progress, and facilitating collaboration and coordination among governments and organisations. This section highlights the roles of four key international institutions in supporting and guiding sustainable agriculture: Food and Agriculture Organization of the United Nations (FAO), the Organisation for Economic Co-



operation and Development (OECD), the World Trade Organization (WTO), and the International Labour Organization (ILO).

Environmental threats and an increased awareness of the negative environmental and social impacts of conventional agriculture, have led these and many other international institutions to increasingly emphasise the need to transition towards a more sustainable agriculture. The **FAO, with its clear mandate, has advanced sustainable agriculture** through various approaches, from sustainable crop production intensification and climate-smart agriculture, to promoting organic agriculture and agroecology. It also provides technical and legal assistance to improve national frameworks. The **WTO's binding trade agreements shape agricultural policies** by establishing legal commitments on subsidies, incentives, and trade-related rules. The Sanitary and Phytosanitary (SPS) Agreement provides an underutilised framework that permits the suspension or restriction of food trade when it threatens human, animal, or plant life or health, providing a mechanism to address the environmental impacts of unsustainable food production. The **ILO has long advocated for better working conditions for agricultural workers**, and its agenda now increasingly incorporates guidelines for sustainable agriculture. The **OECD offers a collaborative forum** for developing policy standards and monitoring environmental performance, involving major food and agriculture producers crucial for promoting sustainable agriculture globally. Their efforts contribute to harmonising national laws and policies, fostering cooperation, and addressing shared environmental, social, and economic challenges.

Part 3 shifts focus to regional instruments addressing sustainable agriculture. It begins with an examination of the **European Union's trajectory from the early years of the Common Agricultural Policy (CAP) to more recent reforms, including European Green Deal and its Farm to Fork Strategy.** While eco-schemes under the 2023–2027 CAP reform were

negotiated in parallel with the European Green Deal, the EU's sustained efforts to transition member countries toward more sustainable agricultural systems offer valuable insights – even though implementation has faced significant political and practical challenges. Learning from these difficulties can benefit other nations pursuing similar objectives. This section also reviews and analyses **regional trade agreements (RTAs) in agriculture, a growing trend in international trade.** These agreements, which may be bilateral or regional, vary in their attention to sustainability issues but are now integral to the trade portfolios of virtually every WTO Member State.

Over the past few decades, there has been a significant evolution in sustainable agriculture policies within the European Union. The EU Common Agricultural Policy (CAP) has adapted to changing needs and new priorities, increasingly focusing on environmental sustainability, social responsibility, and economic viability. This shift has introduced a decentralised decision-making process, allowing resources to be targeted towards local state-defined priorities. Additionally, this evolution has led to the introduction of the “eco-scheme” regime, which supports a sustainable transition for food systems by emphasising farmers' contributions to climate and environmental objectives. Under the previous European Commission (2019–2024), initiatives, such as the Farm to Fork Strategy, the EU Biodiversity Strategy 2030, the EU Adaptation Strategy, and the Nature Restoration Regulation sought, to advance the transition toward sustainable agriculture. While these strategies shaped policy directions, the current European Commission (2024–2029) has reoriented priorities toward frameworks such, as the Green Industrial Deal, creating both uncertainties and opportunities for alignment and policy coherence with CAP and other instruments for sustainable agriculture. Furthermore, there remains a critical need for alignment and policy coherence through CAP and other fundamental instruments for sustainable agriculture. The



above-mentioned initiatives are essential for achieving a sustainable agriculture transition, incorporating key aspects to promote long-term environmental and economic health.

Regional trade agreements (RTAs) related to agriculture vary widely, presenting challenges for implementation and enforcement.

However, RTAs hold significant potential for fostering commitments from participating countries. Consequently, scientific bodies, development banks, and international institutions should provide recommendations and guidelines to facilitate the inclusion of sustainable agriculture in trade agreements. Capacity-building initiatives are essential for reducing emissions, supporting adaptation, and conserving biodiversity within the framework of these agreements.

Part 4 highlights specific areas in national regimes that require review, updating, and harmonisation to support modern sustainable agriculture. It emphasises integrating international obligations and adhering to standards related to trade, food safety, and cooperation, with national laws, codes, standards, regulations, and institutional mechanisms forming the enabling framework. The section begins with issues directly related to climate change and biodiversity, followed by environmental protection, land-use planning, and disaster risk management. It also addresses areas of law that have traditionally been part of a country's legal regime but now need a fresh look due to direct or indirect impacts from climate change and biodiversity loss. These areas include water and soil conservation, worker safety and health, food waste, and food safety.

Governments must formulate and implement adaptation strategies to address climate change impacts on agriculture and develop measures

to mitigate greenhouse gas (GHG) emissions, with a systemic perspective that ensures practical implementation. These strategies, mechanisms, instruments, and regulations must be dynamic and responsive to changing conditions to facilitate a more accelerated transition. Strengthening and enforcing laws requires interconnected frameworks across different sectors, supported by research and development to enhance the effectiveness of public policies. These frameworks must include capacity building, education, extension services, and training to utilise knowledge effectively.

Climate change and biodiversity loss underscore the importance of robust national policy frameworks. Biodiversity conservation is crucial for sustainable development and requires concerted national action. Integrating biodiversity into national policies, strategies, and planning helps mainstream conservation efforts, embedding them into broader agendas and decision-making processes. Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), and National Biodiversity Strategies and Action Plans (NBSAPs) present significant opportunities to accelerate the transition to sustainable agriculture and enhance biodiversity conservation.

Land use planning has evolved to incorporate environmental considerations, which can be leveraged to preserve agricultural land, promote mixed land uses, and encourage sustainable farming methods. Modern land use and spatial planning systems in law and policy now include long-term planning horizons, integration of land use and spatial plans, and the application of the precautionary principle for decision-making to address climate change risks. These advancements facilitate more resilient and sustainable agricultural practices.



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Acronyms

ABS	Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	ITPGRFA	International Treaty on Plant Genetic Resources on Food and Agriculture
AoA	WTO Agreement on Agriculture	IUCN	International Union for Conservation of Nature
BRL	Brazilian Real	KJWA	Koronivia Joint Work on Agriculture
CAC	Codex Alimentarius Commission	KMGBF	Kunming-Montreal Global Biodiversity Framework
CAP	Common Agricultural Policy	LDN	Land Degradation Neutrality
CBD	Convention on Biological Diversity	LULUCF	Land Use, Land Use Change and Forestry
CFS	Committee on World Food Security	NAP	National Adaptation Plans
CMS	Convention on the Conservation of Migratory Species of Wild Animals	NBSAP	National Biodiversity Strategies and Action Plans
COP	Conference of the Parties	NDC	National Determined Contributions
CSA	Climate-smart Agriculture	OECD	Organisation for Economic Co-operation and Development
EAFRD	European Agricultural Fund for Rural Development	OSH	Occupational safety and health
EAGF	European Agricultural Guarantee Fund	PES	Payment for Environmental Services
EESC	European Economic and Social Committee	RAI	Responsible Investment in Agriculture and Food Systems
EIA	Environmental impact assessment	RTA	Regional Trade Agreements
EPA	Economic Partnership Agreement	SDG	Sustainable Development Goal
EU	European Union	SPS	Sanitary and Phytosanitary Measures
F2F	Farm to Fork	TACCC	Transparency, Accuracy, Completeness, Compatibility, Consistency
FAO	Food and Agriculture Organization of the United Nations	TEU	Treaty on European Union
GCF	The Green Climate Fund	TFEU	Treaty on the Functioning of the European Union
GDP	Gross domestic product	UN	United Nations
GFC	Global Framework on Chemicals	UNCCD	United Nations Convention to Combat Desertification
GHG	Greenhouse gas	UNEP	United Nations Environmental Programme
GSP	Global Soil Partnership	UNFCCC	United Nations Framework Convention on Climate Change
GURT	Genetic Use Restriction Technologie	UNGA	UN General Assembly
HACCP	Hazard Analysis Critical Control Points	WFP	World Food Programme
HLPE-CFS	High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security	WHO	World Health Organization
IFAD	International Fund for Agricultural Development	WOAH	World Organisation for Animal Health
ILO	International Labour Organization	WTO	World Trade Organization
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services		
IPCC	Intergovernmental Panel on Climate Change		
IPPC	International Plant Protection Convention		



Aerial View of Green Trees and Farmland, West Java, Indonesia/pexels © Tom Fisk

1. Introduction

1.1. Context

Agriculture has enabled human populations to dominate the world's landscapes for many thousands of years. From that moment on, the **science of agriculture has kept pace to meet the growing food requirements of an increasing population**. As highlighted in the IUCN report, *Common Ground* (Labordière et al., 2020), in recent decades, the agricultural sector has significantly increased productivity and drastically reduced the number of food-insecure people worldwide. Most production growth has been reached through intensification, a massive increase in the use of inputs (including agrochemicals), mechanisation, irrigation, and new breeds. These practices have been harmful to the very essence of agricultural productivity – the soil – to the extent that land and landscape degradation now threatens the future of the current agricultural system. Given that the amount of land available for agricultural expansion has become limited, there are also concerns about pushing agriculture into increasingly marginal areas, affecting biodiversity and critical habitats (Labordière et al., 2020).

Many diverse types of agricultural techniques and practices exist today, but to **adjust to the exponential trends of our population without compromising the integrity of the environment, it is necessary to have a global transition towards sustainable agriculture**. With the current population at 8.2 billion (UNFPA, n.d.), the United Nations estimates the world's population will increase by nearly two billion persons in the next 25 years, to 9.7 billion in 2050 and could peak at nearly 10.4 billion in the mid-2080s (UN, n.d.a).

Despite progress, a recent United Nations report estimated that in 2022, about 9.2 of the world's population still faced chronic hunger, equivalent to about 735 million people, and an estimated 29.6% (or 2.4 billion people) were moderately or severely food insecure, meaning they did not have access to adequate food (UN, 2023, p. 14). Whether urban or rural, today, a growing population that needs food and fibre to meet its basic needs today and find a global solution to hunger and food security will only become more challenging and urgent. **There is no other option than to find cost-effective and environmentally sustainable ways to feed the world's population**. “By acknowledging the major growing demand for agricultural products concurrent with the environmental crises we face, the concept of ‘sustainable agriculture’ emerged as the necessary way forward” (Oberč & Arroyo Schnell, 2020, p. 1).

For several decades, **FAO has been at the forefront of activities towards defining, implementing, and monitoring sustainable agriculture**. It has taken the lead in supporting concepts and promoting international treaties, policies, strategies, and programmes for sustainability in food and agriculture, stating that

[...] projections indicate that 80% of the additional food required to meet demand in 2050 will need to come from land already under cultivation. However, [t]here is little scope for expansion of this agricultural area, except in some parts of Africa and South America. Much of the additional land available is not suitable for agriculture, and the ecological, social and economic costs



of bringing it into production would be very high. (FAO, 2014a, p. 9).

The global food system must be transformed to meet population needs, by and become becoming more productive and more inclusive of poor and marginalised populations, while remaining environmentally sustainable and resilient (FAO, 2018a, Fig. 2, p. 4).

Agricultural renewed intensification has led to the decline of traditional farming methods that have endured for centuries and often supported higher levels of landscape heterogeneity and biodiversity. This intensification has involved a shift towards specialisation and monocultures, which reduces the number of natural predators, resulting in increased crop-pest infestations and a higher reliance on pesticides (Labordière et al., 2020). Consequently, this pattern has caused habitat loss and degradation, water pollution in the form of soil erosion and sedimentation, and air pollution. The lack of specific measures in international agreements to regulate the agricultural industry has exacerbated these environmental impacts, contributing to the sector's poor environmental record (see Connard, 2004).

At the same time, from a socio-economic perspective, technological advances in agriculture have allowed farmers to cultivate more land with less labour. One of the **major consequences of increased mechanisation of the agricultural system is the reduction of job opportunities on farms, pushing many families to move to urban centres**. This migration leads to the decline of rural communities, which are the custodians of agricultural traditions, biodiversity and other natural resources.

In the conventional agricultural model, **environmental and social externalities are inadequately considered**, resulting in their insufficient integration into decision-making processes that shape the development of agriculture and food systems. There is a critical need for comprehensive regulation of the agricultural sector to design and implement concrete transition pathways towards more sustainable agriculture and food systems at various scales, from local (farm, community and, landscape) to national, regional, and global levels (HLPE, 2019). This study aims to review the regulations adopted at different scales and assess their effectiveness in supporting countries to develop relevant national policy frameworks for sustainable agriculture, ultimately facilitating a transition to more resilient and environmentally sustainable agricultural and food systems.

1.2. Purpose and audience

The purpose of this initiative on policy and legal enabling conditions for sustainable agriculture has been to **identify and assess key areas of law and policy that require renewed attention to adequately support development and implementation of sustainable agriculture**, particularly at the national level. Increasingly, sustainable agriculture is recognised as an essential element for long-term sustainable development. Policies that support conventional agriculture began to be integrated into national frameworks in the late 19th and early 20th centuries, gaining significant momentum

after World War II to ensure food security and promote rural development (FAO, 2009). More recently, these policies have evolved to also tackle the challenges associated with sustainability and climate change. This report focuses on the areas of law and policy that now require review and updating to adequately support a country's transition to sustainable agricultural programmes and practices. These relate to biodiversity conservation, climate change adaptation and mitigation, land use planning and zoning, and environmental regulations, as well as support to farmers with knowledge



and resources to understand the importance of sustainable agriculture and to adopt innovative practices.

With this in mind, the approach has involved conducting **research and analyses of developments and commitments in international law and policy**, as well as within international and regional institutions relevant for achieving sustainable agriculture. The aim is to reflect the latest global developments, commitments, and existing and emerging sustainability guidance for achieving sustainable agriculture. In this context, key law and policy considerations are important for implementing sustainable agricultural programmes and practices at the national level. Knowledge of international law, policy instruments, and institutions that provide guidance or establish obligations for Member States enhance the

understanding of the nature and dimensions of sustainability and how national legal systems can respond.

The **main audience for the report** is policymakers and government officials (especially in developing countries), environmental NGOs and advocacy groups, and agricultural sector stakeholders, including IUCN Secretariat and Members. Other audiences which may find the report and its findings useful include legal scholars, academic institutions and international organisations, especially those working with climate change mitigation in both agricultural and the related food sector, environmental restoration of natural resources (land, air, water), or social and economic challenges for rural agricultural livelihoods. Finally, the report is written in a non-technical style to engage a diverse range of stakeholders.

1.3. Defining sustainable agriculture

Sustainable agriculture has been defined in various ways, but in the most basic form, it means developing agricultural practices which protect the environment while preserving the economic profitability of farmers (see Hamilton, 1993). The basis of the concept is that no agricultural system can be successful in either the short or long term unless it is designed to sustain the resources necessary for its operation (Hamilton, 1990). These resources include both physical resources (soil, air, water) and human and social resources of farm families, rural communities, and the national and global economic structure necessary for an agrarian system to function. By focusing on how decisions affect the ‘sustainability’ of agriculture, laws and policies can be formulated to protect the environment and the welfare of people.

In 2020, the **IUCN-Europe office launched the report *Approaches to sustainable agriculture*** as a reference document for key approaches, concepts, and practices currently considered by practitioners, researchers, and policymakers.

Addressing the question of what sustainable agriculture entails, the report stated:

“[a]lthough there is no unified agreed-upon definition of sustainable agriculture, we can say that the idea of sustainable agriculture should be in agreement with the definition of sustainable development. Therefore, and as outlined in the UN Brundtland report (UNGA, 1987), sustainable agriculture should be able to meet the current needs of society without compromising the ability of future generations to meet their own needs. It should take into account environmental, social, and economic sustainability, which constitute the three central pillars of sustainable development.” (Oberč & Arroyo Schnell, 2020, p. 5).

The concept of sustainable development has become one of the most frequently used frameworks for analysing the agricultural and food sector in a comprehensive way



(Schader et al., 2014). Its objective is to improve people's quality of life without exploiting natural resources beyond the capacities provided by the natural environment. In this context, "sustainable agriculture contributes to all four main components of food security, including availability, access, utilisation and stability, in a manner that is environmentally, economically and socially responsible over time" (FAO, 2014a, p. 12).

In 1988, **FAO incorporated the three central pillars of sustainable development in defining sustainable agriculture** as "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Sustainable agriculture conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable" (FAO, 2022a, p. 1).

The farm level is critical for designing sustainable food systems, as decisions made here have significant social and environmental impacts.¹ However, agricultural – and food systems – are intricately linked with economies, cultures, societies, health, food security, nutrition, climate, biodiversity, and the environment. **The interrelated challenges associated with these systems demand integrated actions** by multiple stakeholders at local, national, regional, and global levels, involving both public and private sectors and spanning various domains, including agriculture, trade, policy, health, environment, gender norms, education, transport, and infrastructure. Given this complexity, policy responses should be guided by an integrated systemic approach, which considers the ecosystems and food systems in its entirety, accounting for all elements, their relationships, and related effects. This approach is not confined to a single sector, sub-system, or

discipline; instead, it broadens the framing and analysis of issues as the result of an intricate web of interlinked activities and feedback loops. It takes into account all relevant causal variables of a problem and all social, environmental, and economic impacts of potential solutions to achieve transformational systemic changes. This comprehensive approach makes it possible to take stock of relevant sectoral policies, mapping and analysing synergies, trade-offs, and externalities within and among economic, social, and environmental dimensions (FAO, 2021a & 2018a).

A wide range of approaches to sustainable agriculture, as well as supporting activities, were examined in the 2020 IUCN Europe report. These included agroecology, nature-inclusive agriculture, permaculture, biodynamic agriculture, organic farming, conservation agriculture, regenerative agriculture, carbon farming, climate-smart agriculture, high nature value farming, low external input agriculture, circular agriculture, ecological intensification, and sustainable intensification.

The IUCN Europe report noted that each of **the approaches consider the sustainability of agriculture from different perspectives** but that overall, the approaches appear to share more similarities with each other than with conventional agricultural approaches. In particular, they shared the common goal of striving for sustainability, including socio-economic considerations (Oberč & Arroyo Schnell, 2020, p. 9). Furthermore, the report emphasised that in principle there should be a consensus on how the three pillars of sustainability apply to sustainable agriculture, although the extent to which the approaches to sustainable agriculture may consider or focus on one pillar more than another differs (Oberč & Arroyo Schnell, 2020, p. 24). It could therefore be concluded that approaches focusing on sustainably and increasing productivity emphasise the economic pillar, whereas

¹ Development of sustainable food systems across three overlapping areas, including renewable energy, new equipment, tools, technology and systems for high-tech protected cropping, solutions for adding value to produce (see, for example, [Future Food Systems](#)).

those that prioritise reducing inputs, fostering diversity, and addressing equity and governance issues (structural changes), such as agroecology, place greater emphasis on the environmental and social pillars. In fact, approaches related to sustainable intensification of production systems generally involve incremental transitions, while agroecological and related approaches, such as permaculture, are more transformative. While the choice of approach will depend on local contexts and specific priorities, it is important to consider that both incremental transitions at small scales and more structural changes to

institutions and norms at larger scales need to happen in a coordinated and integrated way, to achieve the transformation of food systems required (HLPE-CFS, 2019).

Of the various approaches to sustainable agriculture mentioned, two have been singled out by FAO as embracing of the basic concepts and scope. These are **agroecology and organic agriculture**, both of which have been supported with policy and law guidance from FAO's Committee on Agriculture² and the Committee on World Food Security³ (see Box 1).

² Provides policy and regulatory guidance on agriculture. For more information, see: <https://www.fao.org/coag/en>.

³ For more information, see: <https://www.fao.org/cfs/en/>.



Box 1

A snapshot of how agroecology and organic agriculture upholds sustainable agriculture

FAO's Committee on Agriculture **has defined agroecology** as an overarching approach that embraces strategic elements of the subjects, mechanisms and tools for sustainable agriculture. This system involves the application of ecological factors to optimise interactions between plants, animals, humans, and the environment, while considering social dimensions for a sustainable and fair food system.

Agroecology applies ecological concepts and principles to food and farming systems, focusing on the interactions between microorganisms, plants, animals, humans and the environment, to foster sustainable agriculture development [...] and integrate transdisciplinary knowledge, farmers' practices and social movements while recognising their mutual interdependence" (FAO & UNEP, 2020, p. 591). The decision defines a "bottom-up approach that addresses root problems with contextualised solutions and combines science with the traditional, practical and local knowledge of producers while enhancing their autonomy and adaptive capacity". (FAO & UNEP, 2020, p. 591).

In fact, **there have been many efforts to establish principles of agroecology in the scientific literature, as well as by international organisations and civil society**. Agroecology is currently associated with a set of principles for the agricultural and ecological management of agri-food systems, along with broader socio-economic, cultural, and political principles that have recently emerged from agroecological social movements. In 2018, through multi-stakeholder dialogues on agroecology, FAO proposed 10 constituent elements of agroecology to frame and structure FAO Member Countries' engagement with this area of work. The HLPE (2019) has also developed a consolidated list of 13 principles, combining and reformulating principles from three primary sources (CIDSE, 2018; FAO, 2018b; Nicholls et al., 2016), based on seminal scientific literature and multi-stakeholder dialogues on agroecology. The principles are comprised of the following key elements:

- i) Recycling;
- ii) Input reduction;
- iii) Soil health;
- iv) Animal health and welfare;
- v) Biodiversity;
- vi) Synergy (positive ecological interaction);
- vii) Economic diversification;
- viii) Co-creation of knowledge (embracing local knowledge and global science);
- ix) Social values and diets;
- x) Fairness (supporting dignified and robust livelihoods for all food system actors);
- xi) Connectivity (proximity and trust between producers and consumers);
- xii) Land and natural resource governance;
- xiii) Participation (social organisation with greater participation in decision-making).

In the same way, the FAO Committee on Agriculture **defines 'organic agriculture'** as a: "holistic production management system that avoids use of synthetic fertilisers, pesticides and genetically modified organisms, minimises pollution of air, soil, and water, and optimises the health and productivity of interdependent communities of plants, animals and people" (FAO & UNEP, 2020, p. 596).

FAO's promotion of organic production is based on its assessment that this approach "inherently results in better adaptation to local conditions to harness ecosystem services (such as improved water retention, carbon sequestration, and other positive impacts on land, soil, and water resources), as well as contributing to mitigate climate change through improved livestock, crop and farm management and restoration of degraded lands. Its social benefits include avoiding harm to human health, community development, public benefits through its contribution to a more nutritious food supply, improved environment and lower pollution of land, air and water resources" (FAO & UNEP, 2020, p. 596). Its law and policy guidance on this approach suggests that the supportive legislative framework will span rules for production, procedures and requirements relating to the certification, labelling, and institutional responsibilities. Such laws and policies also should focus on the environmental and social requirements for production (FAO & UNEP, 2020).

1.4. Role of policy and law

1.4.1. Context

Agriculture depends largely on the services provided by ecosystems. Thus, sustainable agriculture must be guided and managed to minimise the negative impacts on the environment while optimising production by protecting, conserving and enhancing natural resources and using them efficiently. To effectively achieve this goal, responsive policy and legal frameworks are required to protect agroecosystems while meeting society's growing needs by offering decent and resilient livelihoods for rural populations.

The **role of policy and law in achieving sustainable agriculture involves** developing strategies, based on best available science, implemented by associated rules, incentives, and compliance mechanisms to reach those multiple natural and human-related objectives. In addition, policies and laws supporting and promoting sustainable agriculture will need to consider other sectors involved, for example, environmental protection, land rights, health, gender and labour issues, education, transport and infrastructure, finance, and economy and trade. For effective implementation, consistency and compatibility across these sectors should be both horizontal (multi-sectoral) and vertical (across administrative levels of government).

In recent years, **FAO and UNEP have been particularly engaged** in providing guidance to countries on key considerations for sustainable agriculture law and policy. A major joint report issued in 2020, entitled *Legislative approaches to sustainable agriculture and natural resources governance*, provides a comprehensive review of existing national law approaches to sustainable agriculture and natural resources governance, as well as a review of key international instruments promoting sustainable development and, by extension, sustainable agriculture (FAO & UNEP, 2020). The report has been a rich source of information for this initiative. While it is beyond the scope and capacity of this report to delve into

an extensive analysis, interested researchers are encouraged to explore the wealth of information it contains, which includes summaries of various national legislative approaches that promote sustainable agriculture.

Basic principles for legislation. In a further context, it is valuable to highlight key findings from the FAO/UNEP report mentioned earlier, focusing on core considerations for designing national legal frameworks for sustainable development of natural resources. It should be stressed that the application and adaptation of these findings into national systems are the responsibility of each country. The specific approach used and how it is framed depends on the country's particular needs, priorities, and policy feasibility, as well as the legal system and drafting style (FAO & UNEP, 2020).

- 1. Agriculture-specific laws require a systemic approach that acknowledges inter-sectoral linkages.** “[P]olicy coherence necessarily involves a simultaneous review of legislation pertaining to, among other areas, environment, land use and land tenure, water, natural disasters and emergencies, food, industry, manufacturing and processing, investment, infrastructure, public-private partnerships and local government administration” (FAO & UNEP, 2020, p. 579).
- 2. “The concept of ‘sustainable agriculture’ involves** production with farming techniques that protect public health, conserve biodiversity and the environment, strengthen human communities, and ensure animal welfare” (FAO & UNEP, 2020, p. 580).
- 3. Sustainable agricultural development exists within the broader context of rural development,** which encompasses multi-disciplinary elements addressing environmental, social and economic challenges and opportunities. This

includes environmental aspects such as climate change and biodiversity, as well as social challenges of such as integrating youth, women, smallholders, and other marginalised groups into productive sectors. It also aims to enhance employment opportunities, expand financing options, improve access to markets for products, and ensure access to services and infrastructure (FAO & UNEP, 2020).

In terms of **integrating sustainability into agricultural law frameworks**, the same report emphasises the need to include provisions in legislation that enable adaptation to rapid change and increased uncertainty. It underscores that sustainability should be seen as an ongoing process rather than a static endpoint to achieve. This requires the development of technical, policy, governance, and financing frameworks that support agricultural producers and resource managers engaged in a dynamic process of innovation (FAO, 2014b, p. 268). In particular:

- **Policies and institutions are needed that provide** incentives for the adoption of sustainable practices, to impose regulations and costs for actions that deplete or degrade

natural resources, and to facilitate access to the knowledge and resources required;

- Sustainable agricultural practices must make full use of **technology, research and development, although with much greater integration of local knowledge than in the past**. This will require new and more robust partnerships between technical and investment-oriented organisations;
- Evidence-based planning and management of the agricultural sectors requires suitable **statistics, geospatial information and maps, qualitative information and knowledge, and monitoring systems**. Analysis should focus on both production systems and the underlying natural and socio-economic resources;
- **International governance mechanisms and processes** must support sustainable growth (and the equitable sharing of benefits) in all agriculture sectors, protecting natural resources and discouraging collateral damage. The challenges relating to stocks and utilisation rates of natural resources often transcend national boundaries.

1.5. Outline of the report

This report explores the **multi-dimensional aspects of the law and policy** that relate to implementing sustainable agriculture. The assessment goes from international law and policy, to regional instruments, and then to core national issues that need attention in national policy and law frameworks, to enable, support, and effectively implement sustainable agriculture programmes over the long-term. These components are briefly explained below.

Chapter 1 reviews a selected number of recent international law and policy instruments that incorporate sustainable agriculture obligations, commitments, and guidance for countries. The review includes conventions

dealing with biodiversity, climate change, and desertification, as well as wetlands and migratory species, all of which involve commitments essential for guiding and supporting sustainable agriculture. This section also provides a brief overview of key policies relevant to sustainable agriculture in the UN Sustainable Development Goals, Sendai Framework for Disaster Risk Reduction, and Codex Alimentarius (the global food code managed by FAO and WHO).

Chapter 2 focuses on key international institutions with mandates or initiatives related to sustainable agriculture, either directly or indirectly providing guidance, standards, or best practice, led by the FAO as

the primary UN agency responsible for guiding sustainable agriculture, followed by the **World Trade Organization and the International Labour Organization**, both of which have general mandates reinforced by conventions and recommendations relevant to sustainable agriculture legal frameworks at the national level. Chapter 2 also discusses **major international policy instruments guiding countries in their goals for sustainable development, specifically the UN Sustainable Development Goals (SDGs)**. Two additional international policy instruments are examined: the Sendai Framework for Disaster Risk Reduction 2030 and the Codex food code, both of which, while broader in scope, provide key standards and guidance important for national support of sustainable agriculture.

Chapter 3 shifts to **regional instruments on sustainable agriculture**, starting with the **European Union's role on this topic from the early years of the Common Agricultural Policy (CAP) to more recent reforms**, including the European Green Deal and its Farm to Fork Strategy. Given the significant and enduring EU efforts to transition member countries' conventional agricultural systems to sustainable systems, this section offers insights for other countries working towards similar goals. **Regional trade agreements (RTAs) in agriculture are also briefly discussed in this**

chapter. As part of the multilateral trade system, every WTO member country today is also a party to at least one RTA.

Chapter 4 highlights specific areas in legal systems that countries need to review, update, and harmonise to meet sustainable agriculture's evolving demands. Legislative review and updating have become essential, as climate change and biodiversity loss create global crises affecting all aspects of economic, environmental, and social welfare. The section first addresses areas directly related to climate change and biodiversity, then covers environmental protection, land-use planning, and disaster risk management – those areas primarily influenced by climate change and biodiversity. It then examines traditional legal domains that now require fresh perspective due to direct or indirect climate change and biodiversity loss impacts: water and soil conservation, worker safety and health, food waste, and food safety.

The report culminates with concluding messages in **chapter 5**, a complete list of **references**, and an **annex with cases studies** illustrating the efforts of five countries to incorporate sustainable agricultural law and policy in their legal regimes – Brazil, Germany, Uganda, Kyrgyzstan, and Viet Nam.



Cattle in fields, Centro, MG, Brazil/pexels © Helena Lopes

2. Global instruments

This part explores the **multi-dimensions of key international environmental law and policy instruments directly or indirectly promoting sustainable agriculture**. It starts with major legally binding instruments, such as conventions, treaties, and formal agreements, that create legal obligations for countries which are Parties to the instrument. This is followed by a discussion of major non-legally binding instruments setting out policy targets and principles independently of a particular convention, including specific guidance for agriculture.

Both categories define objectives and set out obligations or guidance important to consider in national policy and legal frameworks supporting sustainable agriculture. Normally, international law commitments are directly incorporated in national law frameworks to show compliance. International non-binding

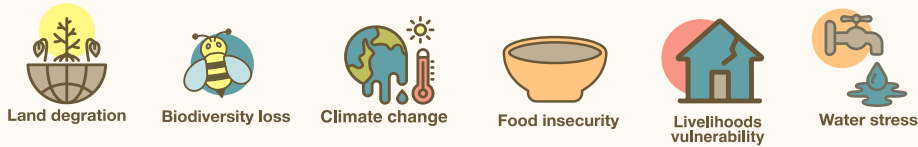
instruments are meant to influence a national policy and are more often than not explicitly integrated in national policies and strategies for specific sectors or across sectors.

In this study, it was not feasible to cover a variety of international instruments potentially relevant for sustainable agriculture, for example, the large spectrum of international water law. The approach used was to **focus on the most directly relevant instruments for sustainable agriculture**. These fall into three broad and potentially overlapping categories: i) instruments with specific requirements to reflect for national laws and strategies; ii) instruments with specific policy guidance; and iii) instruments with global objectives and targets for countries to meet, and a process that is facilitated by supportive laws and policies.

Cultivating Coherence:

Food and Agricultural System (FAS) at the Crossroads of Policy Pathways

FAS are deeply intertwined with nature, climate, and human well-being. Focusing on FAS transformation can create coherence across fragmented policy pathways and enable systemic solutions to interconnected sustainability challenges.

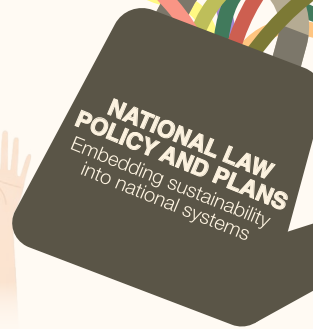


International Treaties



Soft Law

UN SDGs providing global coherence across all 17 goals –



Sustainable Agriculture The Systemic Solution

NBSAPs National Biodiversity Strategies and Action Plans NDCs Nationally Determined Contributions NAPs National Adaptation Plans LDN Targets Land Degradation Neutrality Targets

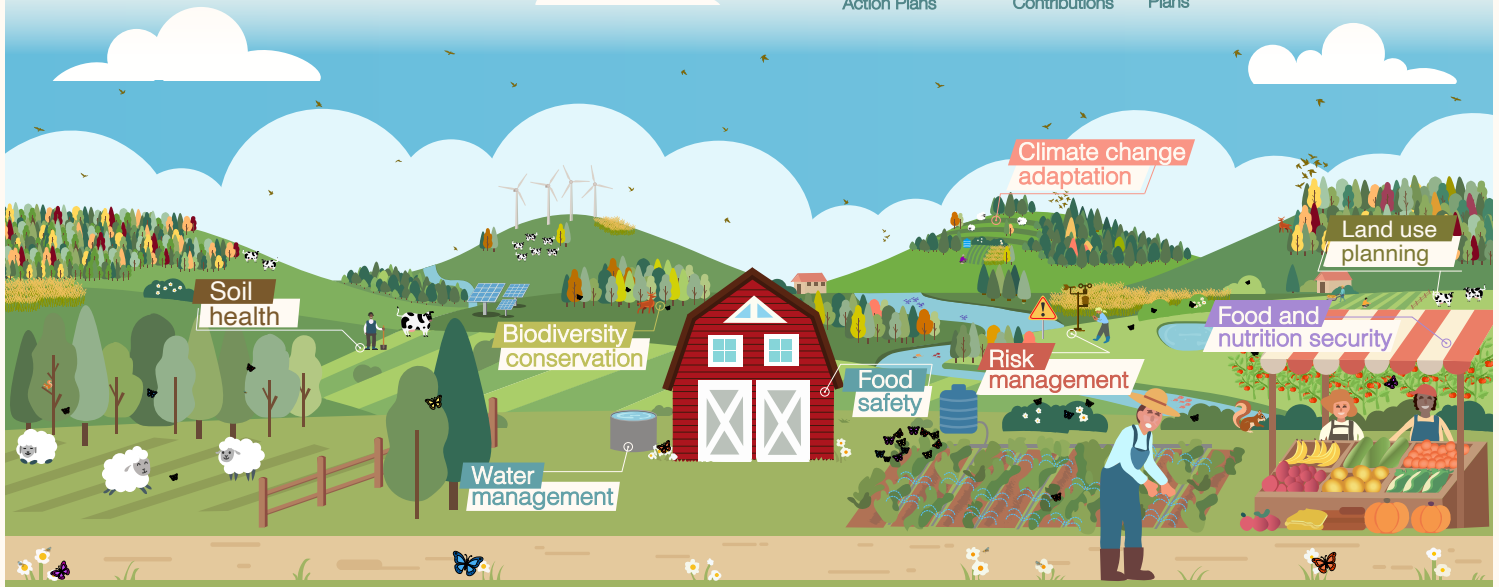


Figure 1: Infographic representing global food and agricultural systems and policy pathways

Source: This infographic was conceptualised by IUCN and produced under the France-IUCN Partnership. Illustration by Daniel Murillo Solan.

2.1. International law

This section focuses on five major **international legally binding instruments on biodiversity conservation, climate change, desertification, wetland protection, and migratory species**.

The **first three themes correspond to the Rio Conventions**, three fundamental international agreements that emerged from the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, held in Rio de Janeiro, Brazil, in June 1992. The Rio Conventions – the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD) – are interconnected and address critical global environmental issues. Together, they promote a comprehensive approach to sustainable development and natural resource management (later related to sustainable agriculture), recognising that biodiversity, climate change, and desertification are interlinked and require integrated solutions.

The other two major international legally binding instruments correspond to key biodiversity-related Conventions: the Convention on Wetlands, known as the Ramsar Convention (1971), and the Convention on the Conservation of Migratory Species of Wild Animals (CMS) (1979). These two Conventions enhance the framework established by the Rio Conventions, by focusing on specific ecosystems and species critical for biodiversity. Through their complementary approaches, the five Conventions strengthen global efforts to achieve sustainable development – and sustainable agriculture – highlighting the interconnectedness of environmental challenges that need integrated solutions.

The following **discussion of each Convention** provides an overview, focusing on the elements

that define direct obligations and associated guidance for consideration in national laws and policies, to enable sustainable agriculture programmes and practices.

2.1.1. Convention on Biological Diversity

The **Convention on Biological Diversity (CBD)**⁴ was opened for signature at the United Nations Conference on Environment and Development on 5 June 1992, and entered into force on 29 December 1993, after receiving 168 signatures. As of 2024, CBD has 196 Contracting Parties. The CBD's three main objectives are biodiversity conservation, sustainable use of its components (species, genetic resources, ecosystems), and fair and equitable sharing of benefits from the use of genetic resources (Article 1).

These **objectives are critical components to achieving sustainability in agriculture**. The CBD lays out the obligation of countries to use their biological resources sustainably, including natural resources used in agriculture. *Biological resources* are defined to include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity (Article 2). It is broadly agreed that biodiversity is significantly reduced by continued and expanding conventional agriculture based on unsustainable land use practices that with time diminish agricultural productivity and further degrade the land (Boer & Hannam, 2021). The avoidance of land degradation is implicit in 'sustainable use', a concept defined by the CBD to mean:

[...] the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. (Article 2)

⁴ For further information, please see: <http://www.cbd.int>

Moreover, the **CBD recognises the strong inter-dependence between the broad concept of biological diversity and agricultural biodiversity**.⁵ This is critical for advancing the objectives of the CBD. Different estimations suggest that around 40% to 44% of the Earth's land surface are used for agriculture (FAO, 2024a; UNCCD, 2022b, p. 25). In total, this corresponds to an area of 48 million km². Croplands make up one-third of agricultural land, and grazing land make up the remaining two-thirds. While agriculture contributes significantly to conservation and sustainable use of biodiversity, a recent UNEP-supported report concluded that the global food system is the primary driver of biodiversity loss on the planet (Benton et al., 2021).

With more than eight billion mouths to feed, not only is more land being converted to food production, but there is also a growing trend towards intensifying production on existing agricultural lands. Both expansion and intensification of agriculture lead to significant environmental degradation and biodiversity loss around the world (Garcia, 2020). The Earth's biodiversity is being lost at an alarming rate, putting in jeopardy the sustainability of agriculture and the ecosystem services critical to agricultural productivity. Loss of biodiversity limits the options for building resilient and adaptive agriculture, further threatening food security and livelihoods worldwide. According to the 2022 Living Planet Report by the World Wildlife Fund, humanity overuses our planet by at least 75%, equivalent to living as if we had 1.75 Earths. Cropland and grazing land together account for 24% of Earth's ecological footprint, with cropland representing 19% and grazing land 5% (WWF, 2022, p. 67). This overshoot erodes the planet's health and humanity's prospects for future well-being.

In 2000, **recognising the link between agriculture and biodiversity, the CBD Contracting Parties established a Programme of Work on Agricultural Biodiversity**.⁶ This programme acknowledged the contributions of farmers and Indigenous and local communities to the conservation and sustainable use of agricultural biodiversity as well as the importance of it to their livelihoods. Its objectives included promoting positive agricultural practices, conserving genetic resources, and ensuring fair benefit-sharing. The programme was structured around four elements: i) assessment of agricultural biodiversity; ii) identification of adaptive management policies; iii) capacity building and increasing awareness; and iv) mainstreaming agricultural biodiversity in national plans and strategies.

The programme also addressed four cross-cutting initiatives related to the conservation and sustainable use of pollinators, soil biodiversity, biodiversity for food and nutrition, and genetic use restriction technologies (GURTs). In 2008, biofuel production and use were also integrated in the programme.⁷ This programme has been crucial for achieving the objectives of the CBD and addressing issues like climate change, providing comprehensive guidance for developing national sustainable agriculture programs, including essential law and policy elements.

To **provide timely advice related to the implementation of the Convention**, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) – an intergovernmental scientific advisory body – was established in 2012.⁸ This multidisciplinary body, open to the participation of all parties, conducts regular and timely assessments of biodiversity and ecosystem services and their interrelations (CBD, 2013). These assessments

5 For more information on CBD's programme of work on agricultural biodiversity, see: <https://www.cbd.int/agro/whatis.shtml> and <https://www.cbd.int/agro/importance.shtml>

6 For more information on CBD's Programme of Work on Agricultural Biodiversity, see: <https://www.cbd.int/agro/pow.shtml>

7 UNEP/CBD (2008). Biodiversity and Agriculture. The CBD Program of Work on Agricultural Biodiversity. Factsheet. Retrieved October 2025 from <https://www.cbd.int/doc/bioday/2008/ibd-2008-factsheet-02-en.pdf> THESE TWO SOURCES HAVE VERY SIMILAR INFORMATION, WITH THE PROPOSED FOOTNOTE HAVING MORE EXPANDED INFO; SHOULD YOU WISH TO KEEP BOTH, IT WOULD HELP TO HAVE A DIRECT CITATION FROM ONE OR THE OTHER; NOTE THAT 'BIOFUEL' IS NOT MENTIONED IN THE SECOND (THIS) SOURCE

8 For more information about IPBES, see: <https://www.ipbes.net/about>

contribute directly to the initiatives of the CBD and are aimed at supporting the Conference of the Parties (COP) and, as appropriate, its other subsidiary bodies.

The **IPBES Global Assessment on Biodiversity and Ecosystem Services is one of the main references** upon which the CBD builds its flagship publication, the Global Biodiversity Outlook (GBO), which addresses the relationship between agricultural biodiversity and food security, and offers recommendations to improve the sustainable management of agricultural and natural resources.⁹ In addition to this global assessment, the IPBES 2030 work programme includes assessments on the interlinkages between biodiversity, water, food, and health in the context of climate change; the causes of biodiversity loss and determinants of transformative change; the impact and dependence of businesses on biodiversity; and biodiversity monitoring.¹⁰

In this section, we further explore **two instruments offering significant opportunities to accelerate the adoption of sustainable agricultural practices**, the **Nagoya Protocol** and the **Kunming-Montreal Global Biodiversity Framework (KMGBF)**. The Nagoya Protocol focuses on access and benefit-sharing of genetic resources, a crucial component for research and development in sustainable agriculture. The KMGBF provides an ambitious roadmap for biodiversity conservation and sustainable use through 2050, including specific targets for sustainable agricultural management. It serves as the principal instrument for implementing the Convention and its Protocols, aligning and directing the work of the various bodies under the CBD (UNEP/CBD, 2022).

Nagoya Protocol

In 2010, in Nagoya, Japan, States adopted the **Nagoya Protocol on Access to Genetic**

Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (ABS), as a supplemental legally binding agreement to the CBD.¹¹ The treaty, commonly known as the Nagoya Protocol, entered into force on 12 October 2014, and currently has 141 Contracting Parties. It lays out a legal framework for the implementation of one of the CBD's objectives, which has a strong relationship to sustainable agriculture – the fair and equitable sharing of benefits arising out of the utilisation of genetic resources. The Protocol defines as the “‘utilization of genetic resources’ to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology as defined in Article 2 of the Convention” (Article 2). These aspects of knowledge-building are critically important for achieving sustainable agriculture over the long term.

The **aim of the Nagoya Protocol is to create greater legal certainty and transparency for both providers and users of genetic resources covered by the CBD**. This is done mainly by establishing more predictable conditions for access to genetic resources and helping to ensure benefit-sharing when genetic resources leave the country, which has provided the genetic resources. In that context, the **Protocol gives explicit attention to agriculture** in several provisions, starting with the Preamble which recognises “...the interdependence of all countries with regard to genetic resources for food and agriculture as well as their special nature and importance for achieving food security worldwide and for sustainable development of agriculture in the context of poverty alleviation and climate change...”.¹² Furthermore, when developing and implementing national access and benefit-sharing legislation or regulatory requirements, the Parties are required to “...[c]onsider the importance of genetic resources for food and agriculture and their special role

⁹ For more information about the GBO, see: <https://www.cbd.int/gbo5>

¹⁰ For more information about IPBES assessments, see: <https://www.ipbes.net/assessing-knowledge>

¹¹ For more information on the text of the Nagoya Protocol, see <https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf>

¹² For more information on the Preamble of the Nagoya Protocol, see: <https://www.cbd.int/abs/text/articles?sec=abs-00>

for food security” (Article 8 (c)).¹³ Article 8 also requires Parties through their legal frameworks to create conditions to promote and encourage research which contributes to the conservation and sustainable use of biological diversity.

Finally, under Article 4, the **Nagoya Protocol recognises as a specialised instrument the International Treaty on Plant Genetic Resources on Food and Agriculture (ITPGRFA)**.¹⁴ The ITPGRFA, adopted in 2001 and in force since 2004, is the primary specialised international instrument focused on genetic resources for food and agriculture. It facilitates access to and the exchange of specified crops through a multilateral system of access and benefit sharing, and recognises farmers’ rights to save, use, exchange, and sell seeds. Genetic resources for food and agriculture are inherently linked to human activity, resulting largely from long processes of ecosystem modifications, domestication, and selective breeding. Unlike most ‘wild’ genetic resources, the erosion of these genetic resources primarily stems from under-utilisation rather than over-exploitation, a consequence of the specialisation and standardisation of modern farming systems. Therefore, their sustainable use in research, development, and production is vital for conservation. As the extensive exchange of these genetic resources over time has created a strong interdependence among communities, countries, and regions, conservation efforts must be coordinated both in-situ and ex-situ.

The CBD and the Nagoya Protocol complement the ITPGRFA: all three instruments target the conservation and sustainable use of plant genetic resources, reinforce each other, and are meant to be applied in harmony. The objectives of the ITPGRFA (Article 1), are operationalised in provisions, such as Article 6, which promotes diversified use of genetic resources, agro-biodiversity enhancement, and the integration of agricultural productivity

with ecological conservation – fully consistent with CBD Articles 10 and 8(j) on integrating biodiversity into national decision-making and protecting traditional knowledge. Aligning the FAO’s plant genetic resources system with the CBD framework, while reinforcing links to other instruments, such as UNDRIP and UNDROP, allows the ITPGRFA to underscore the cultural and social value of agrobiodiversity, highlighting the need for integrated strategies that connect ecological sustainability, traditional knowledge, and agricultural system resilience. The Nagoya Protocol fosters cooperation and provides a legal framework for access and benefit-sharing, supporting the sustainable use of agricultural genetic diversity.

Kunming-Montreal Global Biodiversity Framework

In December 2022, Parties to the CBD at Conference of Parties 15 adopted a new and ambitious post-2020 Global Biodiversity Framework (GBF), formally known as the Kunming-Montreal Global Biodiversity Framework (KMGBF) (UNEP/CBD, 2022). The KMGBF builds on the CBD’s previous Strategic Plans and is in line with the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (discussed further in this section). It sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050 (UNEP/CBD, 2022, Section A, para. 3). After four years of negotiation, the **KMGBF replaced the CBD’s Strategic Plan for Biodiversity 2011–2020 and its Aichi Targets** which were not met at the global level.¹⁵

The KMGBF sets out **four long-term goals for 2050** related to the 2050 Vision of “living in harmony with nature”, the short titles being: Goal A, Protect and Restore; Goal B, Prosper with Nature; Goal C, Share Benefits Fairly; and Goal D, Invest and Collaborate.¹⁶ **Twenty-three action-oriented targets** to be achieved by

¹³ For more information, see: <https://www.cbd.int/abs/text/articles?sec=abs-08>

¹⁴ For more information about ITPGRFA treaty, see: <https://www.fao.org/plant-treaty/en/>

¹⁵ For an assessment of the Aichi Biodiversity Targets, see: <https://www.cbd.int/gbo/gbo5/publication/gbo-5-spm-en.pdf>

¹⁶ For the full text of the KMGBF Goals, see <https://www.cbd.int/gbf/goals>

2030 are aligned with these goals according to the following categories: i) Reducing threats to biodiversity (Targets 1 to 8); ii) Meeting people's needs through sustainable use and benefit-sharing (Targets 9 to 13); and iii) Tools and solutions for implementation and mainstreaming (Targets 14 to 23).¹⁷ Actions to reach these targets are to be implemented consistently and in harmony with the CBD, its Protocols and other relevant international obligations, taking into account national socio-economic conditions (UNEP/CBD, 2022, Section H, para. 13).

Specifically, **with respect to agriculture, KMGBF Target 10** states:

Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches, contributing to the resilience and long-term efficiency and productivity of these production systems, and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services. (UNEP/CBD, 2022, p. 10)

One of the main indicators identified for this target is **Indicator 10.1, Proportion of agricultural area under productive and sustainable agriculture**. The methodology used to monitor this indicator is the same as that for measuring SDG Indicator 2.4.1, relating to the proportion of land under sustainable agriculture (see [chapter 3.1](#)). It was proposed by FAO and involves measuring the proportion of agricultural areas managed sustainably, considering environmental, economic, and social dimensions. Data collection is conducted through agricultural surveys, and the analysis employs 11 sub-indicators, each with specific

sustainability criteria, including land productivity, profitability, resilience, soil health, water use, fertiliser pollution risk, pesticide risk, biodiversity, decent employment, food security, and land tenure. The data is then aggregated nationally and reviewed every three years to provide a comprehensive view of progress towards sustainable agriculture (UNEP-WCMC, 2025).

Parties also have obligations with respect to their **national law and policy regimes through KMGBF Target 13** requiring Parties to:

Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilisation of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and by 2030, facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments. (UNEP/CBD, 2022, p. 11)

Other targets directly relevant for sustainable agriculture are:

- **KMGBF Target 2, which aims to ensure that by 2030 at least 30% of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration**, to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity. Measures under this target include diagnostics on soil and land health, and restoration activities in agricultural lands, including pastures for livestock, as well as restoration activities in marine ecosystems. These measures ensure the sustainability of agriculture and fisheries and food security.

¹⁷ For information about the 23 Targets of KMGBF, see: <https://www.cbd.int/gbf/targets>

- **KMGBF Target 3, also called the 30 x 30 target**, seeks to ensure that 30% of the land (including inland waters) and 30% of marine and coastal areas are conserved by 2030. This marks a clear increase of ambition from the 17% (land) and 10% (marine) goals intended in Aichi Target 11. Another improvement is the recognition of Indigenous and traditional territories, along with protected areas and other effective area-based conservation measures (OECMs) for how Target 3 will be achieved. Many countries would have to integrate agricultural areas into broader landscape conservation efforts to achieve this target, which represents an opportunity to protect traditional sustainable agriculture systems often threatened by more intensive alternatives. Buffer zones around protected areas can also include sustainably managed agricultural lands that contribute to conservation goals while supporting local livelihoods.
- **KMGBF Target 4, calling for management actions to halt human-induced extinction of known threatened species, thus increasing the ambition of Aichi Target 12**, which aims to prevent the extinction of these species. Threatened species include thousands of plants, animals, and fish, as well as the varieties, breeds, and strains within them that contribute to ecosystem health, upon which our food systems depend. Conserving agrobiodiversity is crucial for adapting to climate change, filling nutrient gaps, and resisting pests and diseases. It is essential to conserve the genetic diversity that underpins our food systems, whether in gene banks, on farms, or in the wild, and to preserve traditional knowledge about their uses and cultivation methods. Efforts to conserve traditional crop varieties and associated knowledge may hold unique genetic keys for future food system adaptation. Efforts under Target 4 should be aligned with Target 13, which aims to facilitate global access to genetic resources and ensure the fair sharing of benefits.
- **KMGBF Target 7 aims to reduce pollution risks and the negative impact of pollution** from all sources by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects. It represents a step down from the ambition of Aichi Target 8 because the KMGBF target focuses only on reducing the risk and impact of pollution, rather than calling for any reductions in usage. However, the inclusion of new pollutants, such as plastics and hazardous chemicals, broadens the scope of the target from Aichi. This target includes reducing the overall risk from pesticides, fertilisers and highly hazardous chemicals by at least half, including through integrated pest management based on science, taking into account food security and livelihoods. Efforts under this target should be aligned with Target A7 of the ICCM Global Framework on Chemicals (GFC).
- **KMGBF Target 18 urges countries to identify and eliminate, phase out, or reform harmful incentives** that negatively impact biodiversity by 2025, with the goal of reducing these incentives by US\$ 500 billion annually and scaling up positive incentives by 2030. These harmful incentives often arise as unintended side effects of other policies and can include production and consumer subsidies, and market price support. For instance, agricultural subsidies that lower input costs or enhance output prices can lead to intensification and extensification, resulting in biodiversity loss and ecosystem degradation. These subsidies also influence cropping choices, tillage practices, crop rotation frequency and types, and farm entry and exit decisions, all of which impacts biodiversity. Similarly, fisheries support can increase fishing effort, lead to overcapacity, and encourage illegal, unreported, and unregulated fishing. The reduction or elimination of harmful incentives should consider their necessity for achieving other societal objectives while aiming to minimise their negative impacts on biodiversity (Matthews & Karousakis, 2022).

The KMGBF is **supported by a detailed monitoring framework**, adopted in Decision 15/5, which includes a set of agreed indicators to track progress towards its Goals and Targets. This framework features headline indicators for high-level tracking, along with optional component and complementary indicators for a detailed analysis, and may be supplemented by national and subnational indicators. Additionally, Decision 15/5 established an ad hoc technical expert group (AHTEG) for further development and operationalisation, while Decision 15/6 adopted an enhanced multidimensional approach to planning, monitoring, reporting, and review.

National Biodiversity Strategies and Action Plans (NBSAPs) are the primary strategic planning documents that identify and prioritise national biodiversity conservation goals and outline the strategies and actions needed to achieve them. It is essential that updated and revised NBSAPs, in accordance with the KMGBF, explicitly promote and support sustainable agricultural approaches while recognising the contributions of peasants, small-scale farmers, livestock farmers, pastoralists, artisanal fishers, forest dwellers, and Indigenous peoples who preserve agricultural biodiversity in their territories, lands, and waters. Comprehensive sustainable agricultural approaches, such as agroecology, are called upon to play a central role in the implementation of KMGBF Target 10. These comprehensive approaches can provide an enabling framework for the systemic implementation of these strategies, fostering coherence between NBSAPs, NDCs, UNCCD, SDGs, and food systems action plans.

2.1.2. United Nations Framework Convention on Climate Change

The UNFCCC was the second convention adopted at the 1992 Rio Summit. It entered into force in 1994 and today has near-universal membership with 198 Contracting Parties.¹⁸

The **ultimate objective of the Convention is to stabilise greenhouse gas (GHG) concentrations** at a level that would prevent dangerous anthropogenic (human-induced) interference with the climate system, with the target that such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, ensure that food production is not threatened, and enable economic development to proceed in a sustainable manner (Article 2).¹⁹ Its key Principles encourage Parties to protect the climate system for the benefit of present and future generations, take precautionary measures to minimise the causes of climate change and mitigate its effects, and promote sustainable agricultural development (Article 2).

Significantly, the **UNFCCC, together with its subsequent supporting treaties, Kyoto Protocol and Paris Agreement** (discussed further in this section), reflect the growing commitment of national governments to support increasing emissions reductions, with a primary focus on agriculture. An in-depth study in 2021 found that if all parts of the food system are taken into consideration, food production is responsible for as much as 40% of global GHG emissions, a number much higher than previously estimated (Tubiello et al., 2021). This study, undertaken by 14 leading scientists worldwide, has focused the need for transition to sustainable agriculture even more urgent.

Principal sources of GHGs from unsustainable agricultural practices, mostly generating CO₂, involve changes in land-use cover, such as clearing forests, draining peatlands for agricultural conversion (Joosten et al., 2012), excessive vegetation clearance, and poor land use (such as conventional cultivation and loss of soil organic matter). Unsustainable practices that exacerbate soil degradation are particularly at issue, since soils are a major reservoir of the Earth's carbon, second only to the oceans. Additionally, agriculture significantly contributes

¹⁸ For general information about UNFCCC, see: <https://unfccc.int/>

¹⁹ For the text of the UNFCCC, see: https://unfccc.int/sites/default/files/convention_text_with_annexes_english_for_posting.pdf.

to emissions of nitrous oxide (N₂O) and methane (CH₄), primarily caused by inorganic fertilisers and enteric fermentation, respectively. Despite being released in smaller quantities than CO₂, CH₄ and N₂O have a much greater global warming potential (Chataut et al., 2023).

There is broad agreement that to **achieve sustainable agriculture in the face of climate change** – rising temperatures, extreme weather events, and changing precipitation patterns – requires adaptive management and shifting to practices that build climate resilience. As reported in the *2019 International Yearbook of Soil Law and Policy* (Hannam, 2021), sustainable agriculture will need to explicitly consider the dimension of climate change by adopting production technologies, laws, and policies that consider the local environment and the problems of bringing more land under cultivation, and increasingly utilising existing agricultural land as carbon sinks.

The **International Panel on Climate Change (IPCC)**, established by WMO and UNEP in 1988, provides a scientific basis for governments to develop climate related policies and to support negotiations at the UNFCCC.²⁰ Its science-based reports include summaries for policymakers that advise on possible actions to take. The Summary for Policymakers of the Sixth IPCC report issued in 2023 found that “[c]limate change has reduced food security and affected water security, hindering efforts to meet Sustainable Development Goals [...] Although overall agricultural productivity has increased, climate change has slowed this growth over the past 50 years globally [...], with related negative impacts mainly in mid- and low-latitude regions but positive impacts in some high latitude regions [...]” (IPCC, 2023a, p. 6, A.2.6). **The report included examples of effective adaptation options in agriculture which policymakers could promote.** These include on-site as cultivar improvements, better on-farm water management and storage, soil

moisture conservation, farm and landscape level diversification in agriculture, and use of agroecological principles and practices (IPCC, 2023a, p. 8).

The 2023 IPCC report projected that continued global warming will further intensify the global water cycle, including its variability, global monsoon precipitation, and very wet and very dry weather and climate events and seasons, more frequent heatwaves and droughts. Because different climate risks are location-specific and defined by region, this **makes the goal of sustainable agriculture and effective climate adaptation very complex and more challenging** as warming increases.

To underscore the importance of national action in climate mitigation and adaption, UNFCCC’s Article 4 mandates all nations to **develop and improve their legal and institutional systems and responsibilities to protect the climate system** for the benefit of present and future generations, to take precautionary measures to prevent or minimise the causes of climate change, and to mitigate its adverse effects (Boer & Hannam, 2019).

Kyoto Protocol

Linked to the UNFCCC is the Kyoto Protocol,²¹ **which was adopted in 1997 and entered into force in 2005, with currently 192 members.** As the **world’s only legally binding treaty to reduce GHGs**, its primary purpose is to operationalise the UNFCCC by committing industrialised countries and economies in transition to limit and reduce GHG emissions in accordance with agreed individual targets. In its Annex B, the Kyoto Protocol sets binding emission reduction targets for 37 industrialised countries and economies in transition and the European Union. It recognises the need to expand and preserve soil carbon sinks and improve agricultural practices in countries where a significant proportion of the emissions

20 For more information about IPCC, see: https://www.ipcc.ch/site/assets/uploads/2021/07/AR6_FS_What_is_IPCC.pdf.

21 For the text of Kyoto Protocol to the UNFCCC, see: <https://unfccc.int/resource/docs/convkp/kpeng.pdf>.

are related to the clearing of vegetation for agriculture (Articles 3 and 5).

In 2001, the 7th Conference of the Parties to the **UNFCCC concluded a set of reporting, accounting, and review requirements for implementing the Kyoto Protocol**. Called the **Marrakech Accords**, these rules were adopted in 2005.²² Among their provisions was the decision to establish a climate fund to support 'prompt' implementation of adaptation measures in areas, such as water resource management, land management, and agriculture.²³

While the obligations set out in the Kyoto Protocol are directed mostly to Parties from industrialised and transition economies, various articles may be instructive as general legislative guidance for framing or strengthening national laws. On this point, Article 2 of the Protocol promotes sustainable development and calls for each Party to implement policies and measures to protect and enhance sinks and reservoirs of GHGs, considering their commitments under various international environmental agreements. Another aspect is the **responsibility to promote sustainable forms of agriculture in light of climate change characteristics**. The main elements of the Kyoto Protocol and its rulebook set out in the Marrakech Accords include valuable procedures which can aid in the development of national legal and institutional strategies to manage land use processes associated with achieving sustainable agriculture for both developing and developed countries.

Paris Agreement

In 2015, a second legally binding treaty linked to UNFCCC, the Paris Agreement,²⁴ was adopted and entered into force in 2016 with near universal participation of GHGs, sets new targets for emissions mitigation, adaptation,

and finance, starting in the year 2020.²⁵ The difference between the Kyoto Protocol and the Paris Agreement is that Kyoto only applied to industrialised countries, while the Paris Agreement included commitments from both developed and developing countries.

Its Preamble recognises "the importance of the conservation and enhancement, as appropriate, of sinks and reservoirs of the greenhouse gases referred to in the Convention".²⁶ Under the Agreement, **each country determines plans and regularly reports on the contribution it should make to mitigate global warming. These reports are referred to as Nationally Determined Contributions, or NDCs**. There is no mechanism to force a country to set a specific target by a particular date, but NDCs are expected to be reviewed and updated periodically in five-year cycles, with each cycle increasing in ambition in a continuous effort to limit global warming. The implementation of these efforts is analysed every five years during a global stocktaking, to assess the collective progress towards achieving the purpose of the Agreement and its long-term goals and to identify gaps.

The **overall aim of the Paris Agreement is to enhance the implementation of the UNFCCC in climate mitigation and adaptation** through: "Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognising that this would significantly reduce the risks and impacts of climate change; and (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production" (Article 2(1a) and (1b), p. 4).

²² For the text of the Marrakech Accords, see: https://unfccc.int/cop7/documents/accords_draft.pdf please share the final version, if relevant

²³ See **Marrakesh Accords**, Part D there is no Part D please clarify, section 8 (a), p. 35.

²⁴ For the text of the Paris Agreement, see: https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

²⁵ See **Paris Agreement**, para. 23, p. 31.

²⁶ See **Paris Agreement**, p. 3.

As concluded by IPCC in its 2023 report, **many regulatory and economic instruments** have already been deployed successfully in furtherance of the Paris Agreement targets. In many countries, policies have enhanced energy efficiency, reduced rates of deforestation and accelerated technology deployment, leading to avoided, and in some cases, reduced or removed emissions (IPCC, 2023a, p. 10). Additionally, adaptation planning and implementation have progressed across all sectors and regions with documented benefits. For example, National Adaptation Plans (NAPs) were proposed at the 2010 Conference of Parties in Cancún as an advance to previous efforts with National Adaptation Programmes of Action (NAPA), which had operational scopes very limited to local or single-sector issues. NAPs are one of the main instruments through which governments can coordinate national climate change adaptation efforts involving multiple national, private, and multi-sectoral stakeholders, serving as a guide for evidence-based planning with a systemic and scaled-up approach to the previous approach (Woodruff & Regan, 2018). However, **most observed adaptation responses remain fragmented, sector-specific, and unequally distributed across regions**. Despite progress, adaptation gaps persist in all sectors and regions, and will continue to grow under current implementation levels, especially in developing countries. Key barriers identified include limited resources (including for research), lack of political commitment, low climate literacy, and a low sense of urgency (IPCC, 2023b, pp. 8–9).

Specifically, for agriculture, a wide range of measures supported by national policy and law will advance GHG mitigation and the commitments and targets set under the Paris Agreement, as well as adaptation. Sustainable land management is a major instrument for climate change mitigation because it increases the sequestration of carbon in the soil. Policies and ²⁷ are needed to support shifts to sustainable land management for the agriculture sector and thus control or prevent land degradation

and increase carbon sequestration on such lands. Specific actions include limiting forest clearing, supporting soil conservation and improvements in soil organic content, and employing conservation farming techniques and preventing overgrazing to expand land cover. Additionally, effective adaptation options include cultivar improvements, agroforestry, community-based adaptation, agricultural and landscape diversification, and urban agriculture. These response options require the integration of biophysical, socio-economic, and other enabling factors (IPCC, 2023a, pp. 29–30).

The **Green Climate Fund (GCF) serves as the primary financial instrument of the Paris Agreement**, facilitating investments in climate resilience and low-emission development. Within its strategic framework, agricultural and food systems were addressed under two critical result areas: the adaptation-focused Health, Food, and Water Security; and the mitigation-focused Forest and Land Use. Collectively, these areas represent nearly 30% of the total implemented fund, with an almost equal allocation between them (GCF, n.d.). This balanced approach ensures a holistic response to climate challenges, supporting both immediate adaptation needs and long-term mitigation goals.

It is worth noting that the Paris Agreement, held under the UNFCCC, structures its discussions like the other two Rio Conventions around cross-cutting topics, with agriculture officially included since the Durban COP-17 in 2011. However, one of the principal milestones occurred during COP-23 in 2017 with the adoption of the Koronivia Joint Work on Agriculture (KJWA), the only agenda item to focus on agriculture and food security under the UNFCCC. The KJWA aimed to drive transformation in agricultural systems by addressing synergies and trade-offs between adaptation, mitigation, productivity, livelihoods, and nutrition. COP-27 further advanced this agenda with decision 3/CP.27, initiating the Sharm el-Sheikh Joint Work on Implementation

²⁷ See IPCC (2023, p. 29) regarding the discussion of 'land, ocean, food, water' actions that provide both mitigation and adaptation benefits.

of Climate Action on Agriculture and Food Security. This initiative builds on the KJWA outcomes and elevates agricultural issues to the level of implementation under the UNFCCC.²⁸

COP-28 Emirates Declaration on Sustainable Agriculture

At the 28th Conference of Parties of UNFCCC in December 2023, 159 world leaders endorsed the COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action, stressing that any path to fully achieving the long-term goals of the Paris Agreement must include agriculture and food systems.²⁹ Together these nations represent 68% (530 million) of the world's farmers, 75% of the global population, 77% of global food production, 81% of the world's arable land, 83% of global emissions from the food system and 83% of the world's agricultural GDP (Davey, 2023).

Even though the Declaration is not legally binding, it was endorsed by 160 countries.³⁰ **Specifically, it recommends that nations scale up adaptation and resilience for farmers, fishers, and food producers**; promote food security and nutrition through social protection systems, school feeding programmes and others; support workers in agriculture and food systems to maintain inclusive, decent work; and strengthen the agricultural multilateral trading system overseen by the WTO with more fair, non-discriminatory, and inclusive rules.

The **Declaration was considered a significant outcome of COP-28 and a break-through** not only for the explicit commitment of countries to link sustainable agriculture to climate mitigation through national policies, but also a step toward agricultural reform of the multilateral trading system managed by the WTO (an issue that has been long deadlocked, as discussed in [chapter 2](#)).

Among other things, **the Declaration further commits nations**, by 2025, to:

- **Integrate agriculture and food systems** into their National Adaptation Plans, Nationally Determined Contributions, Long-term Strategies, National Biodiversity Strategies and Action Plans, and other related strategies before the convening of COP-30; and
- **Revisit or orient policies and government support** – including the US\$ 700 billion of agricultural subsidies the world spends every year – related to agriculture and food systems for such goals as to reduce GHG emissions, and bolster resilience, productivity, livelihoods, nutrition, water efficiency, and human, animal, and ecosystem health, while reducing food loss and waste, and ecosystem loss and degradation.

The Declaration concludes with a commitment to bring relevant ministers together to review collective progress at COP-29 in 2024.

2.1.3. Convention to Combat Desertification

The **United Nations Convention to Combat Desertification (UNCCD) was adopted in 1994 and entered into force in 1996**.³¹ The UNCCD is the only legally binding international agreement to address desertification and the effects of drought, linking environment and development to sustainable land management. There are 197 Parties to the Convention, including 196 country Parties and the European Union.

The **Convention's objective is to combat desertification and mitigate the effects of drought** in countries experiencing serious drought and/or desertification, particularly in Africa, through an integrated framework of effective action at all levels, supported by

28 For more information on FAO and climate change, see: <https://www.fao.org/climate-change/action-areas/climate-negotiations/sharm-el-sheikh-joint-work/en>

29 For the list of signatories and text of the Declaration, see: https://www.maff.go.jp/j/kokusai/kokusei/kanren_sesaku/attach/pdf/COP28-2.pdf and <https://www.cop28.com/en/food-and-agriculture>

30 See FAQ of: <https://www.cop28.com/en/cop28-declaration-on-climate-relief-recovery-and-peace>

31 For the text of UNCCD, see: https://www.unccd.int/sites/default/files/2022-02/UNCCD_Convention_ENG_0_0.pdf

international cooperation and partnership arrangements, in the framework of an integrated approach (Article 2).

Desertification is defined as “land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities” (Article 1). Human activities that contribute to desertification include the expansion and intensive use of unsustainable agricultural lands, poor irrigation practices, deforestation, and overgrazing, putting pressure on the land, altering soil chemistry, hydrology, and biodiversity.³² Around 40–44% of the Earth’s land surface are used for agriculture, forming the habitat and source of livelihoods for a large proportion of its population.

The **UNCCD became the driving force behind SDG 15, Life on Land**, which aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.³³

However, **unlike the CBD and UNFCCC which have universal application, the UNCCD has limitations in its application.** By the scope of the Convention, it does not have the range of provisions considered necessary for the protection and sustainable use of soil *as such*, because its provisions do not adequately recognise soil bodies as ecosystems, nor does it contain elements to capture the full range of legal principles and processes to encourage protection and sustainable management of soil (Boer & Hannam, 2019). Secondly, the UNCCD’s geographic focus of ‘desertification’ is confined to arid, semi-arid, and dry sub-humid areas, which excludes other climatic regions of the world that also experience severe land degradation processes (Boer & Hannam, 2019).

Framework and Guiding Principles for a Land Degradation Indicator. In 2016, the Secretariats of the CBD and UNCCD developed a strategy for

land degradation in the context of biodiversity conservation entitled *Framework and Guiding Principles for a Land Degradation Indicator* (UNCCD et al., 2016). This was intended to be part of the effort to ‘monitor and report on progress towards SDG Target 15.3, among other commitments. SDG Target 15.3 states: “By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”. The Framework recognises that many countries do not have the capacity to monitor and report on land degradation, which is an essential parameter to determine if agricultural land use is being carried out sustainably.

The **purpose of the Framework** is “to provide consistent definitions and the best available methodologies as well as global/regional data options for the three sub-indicators”. These include land cover and land cover change, land productivity, and carbon stocks above and below ground “that could be used to derive the indicator for monitoring and reporting progress towards SDG Target 15.3 as well as other relevant targets and commitments”.

The UNEP Global Environment Outlook of 2019 (GEO-6) concludes that protection policies have built on sustainable land management strategies and used a diversity of regulatory mechanisms, including land tenure and ownership rules, spatial planning, economic incentives, and standards for the use and disposal of pesticides and other chemicals. **“The success of any strategy to combat desertification depends on the implementation of sustainable land and water management practices** that are adapted to specific local geo-biophysical and socioeconomic situations” (UNEP, 2019a, p. 380). Importantly, it found that an integrated approach is key for effective policies, and including environmental concerns into various sectors at all levels (including agriculture, fisheries, tourism, forestry, industry, manufacturing and

³² For more information, see: <https://www.prb.org/resources/whats-behind-desertification/#:~:text=Human%20activities%20that%20contribute%20to,its%20soil%20chemistry%20and%20hydrology>

³³ For more information about SDG 15, see: <https://sdgs.un.org/goals/goal15>

processing, energy and mining, transport, infrastructure and health) is key to effective protection of the environment.

Land Degradation Neutrality. In 2015, the UNCCD Conference of Parties adopted a decision to promote the concept of 'land degradation neutrality' (LDN) to control land degradation (UNCCD, 2015). Land degradation neutrality was defined as "a state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems" (UNCCD, 2015, p. 9). The aim is to encourage implementation of an optimal mix of land use measures designed to avoid, reduce and/or reverse land degradation in order to achieve a state of no net loss of healthy and productive land (UNCCD, n.d.).

Progress toward implementation had been slow. In 2019, UNEP's GEO-6 concluded: "[c]ontinuing on the current track, it will be difficult to achieve the land degradation neutrality target adopted in the United Nations Conference on Sustainable Development (Rio+20)" (UNEP, 2019a, p. 203). Moreover, the report ranked as 'well established' the finding that current land management strategies are not conducive to achieving the SDG 15.3 target as land degradation continues to increase more rapidly than it decreases. Such "degradation entails the decline or disruption of land ecosystem services, including net primary production, which makes the achievement of sustainable agriculture difficult" (UNEP, 2019a, p. 214).

Under the UNCCD, **countries are encouraged to adopt a broad range of sustainable land management measures to avoid, reduce, and reverse land degradation.** These measures include planning, regulation, and sustainable land management practices, "combined with localised action to reverse past degradation, through land restoration and rehabilitation, to achieve a state of no net loss of healthy and productive land" (Global Mechanism of the

UNCCD, p. 5). As land degradation continues to increase worldwide, there is growing discussion about amending the UNCCD to introduce LDN as a legal requirement rather than a voluntary measure, especially in view of the growing focus on country-level LDN targets (Boer & Hannam, 2021).

LDN Targets. As part of the 2015 Land Degradation (LDN) COP 12 decision, UNCCD Parties were invited to formulate voluntary targets to achieve LDN in accordance with their specific national circumstances and development priorities. To assist countries in this effort, UNCCD established the Land Degradation Neutrality Target Setting Programme as part of its Global Mechanism to help countries achieve LDN by 2030. Three indicators of progress with voluntary targets were also adopted: i) trends in land cover; ii) trends in land productivity or functioning of the land; and iii) trends in carbon stock above and below ground. These indicators have become central to reporting on progress towards LDN as well as for achieving the goal of sustainable agriculture.

The **greatest prospects for reversing land degradation**, reducing GHG emissions, and halting biodiversity loss lie in transforming how we utilise and manage human, financial, and natural capital to produce, distribute, and consume food. Some of the measures specifically linked to sustainable agriculture were focused on sustainably increasing agricultural productivity, promoting agroforestry and silvopasture, encouraging greater agricultural diversification, fostering integrated water resource management, and enhancing soil fertility and organic matter (UNCCD, 2021).

For that COP negotiation, **IUCN presented a technical report drawing attention to the complexity involved when setting targets and key considerations** that need to be backed up by national law and policy, including how the targets are set and how action is taken to meet the targets. The IUCN report emphasised "that progress towards LDN: (i) respects biodiversity and ecosystems; (ii) strengthens natural resource

governance and promotes equity, gender equality and human right; (iii) contributes to and benefits from achievement of other multilateral agreements; and (iv) is based on suitable empirical evidence" (IUCN, 2015, p. iv).

Moreover, the **IUCN report recommended that national programmes should complement the LDN** high-level indicators on land productivity, and carbon stock measurement with local-level indicators and assessments to provide an informed insight into the actual situation.

As spelled out in several UNCCD decisions, **these many considerations require attention when setting policy and drafting legal instruments for LDN implementation** in the national context. An essential component is providing national authority and resources for development and implementation of the multipurpose Targets under the LDN target setting program.

The target setting programme is now in the process of implementation. As of March 2024, 131 countries have committed to setting LDN targets, and more than 100 countries have already set their targets. The UNCCD website provides full details on the LDN targets, as well as country reports on the target setting process and the country commitments to achieve LDN. Based on early analysis, the LDN Target Setting Programme is having a strong impact at the country level and changing the paradigm for addressing land degradation in many of the participating UNCCD countries.

In summary, sustainable agriculture plays a relevant role in the UNCCD approach, given that it recognises the link between poor agricultural practices, and their various drivers, and land degradation. The LDN concept is compatible with agrobiodiversity-oriented approaches since it seeks to maintain healthy soils while preserving diversified landscapes, which allows for a variety of native species along with their ecological functions and ecosystem services.

2.1.4. Ramsar Convention

The **Convention on Wetlands of International Importance Especially as Waterfowl Habitat (known as Ramsar** for the small Iranian town where it was adopted in 1971) came into force in 1975.³⁴ As of August 2023, there were 174 Contracting Parties to the Convention. The Convention's mission is the "conservation and wise use of all wetlands through local, regional and national actions, and international cooperation, as a contribution towards achieving sustainable development throughout the world".³⁵ Its primary objective is the protection of wetlands for their fundamental ecological functions as regulators of water regimes and as habitats supporting flora and fauna, especially waterfowl (defined as birds ecologically dependent on wetlands). Listing a wetland under the Ramsar Convention gives it the status of a wetland of international importance. Over the years, the Convention has broadened its scope to cover all aspects of wetland conservation and wise use.

This Ramsar Convention is relevant for agriculture because an estimated 64% of the world's wetlands have disappeared (UNESCO, n.d.) since 1990 and a substantial number of these have been drained and converted to agriculture. In most regions of the world, wetlands continue to be degraded and converted to other uses. Wetlands are among the most diverse and productive ecosystems on the planet. They provide essential services and supply all our fresh water. Many agricultural areas have wetlands within their confines.

Programmes to adopt sustainable agriculture play a critical role in ensuring the conservation, restoration, and sustainable management of wetlands within or contributing to those agricultural lands. In well-managed watersheds, wetlands significantly contribute to regulating climate, water, nutrients, biota, and soils, all essential functions for sustaining agriculture. Conversely, sustainable agricultural practices help maintain the ecological characteristics

³⁴ For more information about the Ramsar Convention, see: <http://www.ramsar.org>

³⁵ For more information about the mission of the Ramsar Convention, see: <https://www.ramsar.org/about/convention-wetlands-and-its-mission>

of wetlands by preserving water quality and supporting biodiversity. Reversing the trend of wetland loss and degradation, while simultaneously providing food security and addressing the anticipated impacts of climate change, will require coherent and consistent policies developed by the water, sustainable agriculture, and environment sectors (Ramsar Convention, 2022).

The first goal of the 2016–2024 Ramsar Strategic Plan is to address the drivers of wetland loss and degradation as negative human impacts on wetlands continue to grow. Among other things, the Strategic Plan calls on Contracting Parties, the Secretariat, and Regional Initiatives, and in collaboration with international organisations to improve their engagement with stakeholders, to diminish threats, restore wetlands, and employ good wetland conservation practices. The first target of Goal 1 is for **wetland benefits to be featured in national/local policy strategies and plans relating to key sectors, such as agriculture, water, and energy** at the national and local levels.

2.1.5. Convention on Migratory Species

The **Convention on Migratory Species of Wild Animals** (CMS) was concluded in 1979 and entered into force in 1983.³⁶ As of 1 March 2022, the CMS has 133 Parties. In addition, several countries, although not Parties to CMS, are Parties to one or more of the Agreements and/or have signed one or more of the Memoranda of Understanding (MOU).³⁷ The CMS provides a global platform and framework for the conservation and sustainable use of migratory animals and their habitats, including through agreements between Range States (States through which migratory animals pass) (CMS, n.d.).

Migratory species threatened with extinction are listed in the Convention's Appendix I. CMS Parties have a **responsibility to protect these animals,**

conserving or restoring the places where they live, including on agricultural land, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international co-operation are listed in Appendix II of the Convention and for these the Convention encourages the Range States to conclude global or regional agreements. These range from legally binding treaties (called agreements) to less formal instruments, such as Memoranda of Understanding (MOU), and can be adapted to the requirements of particular regions. Presently the CMS instruments for this purpose include seven Agreements, 19 MOUs, and four Special Species Initiatives.³⁸

Sustainable agriculture plays a role in supporting conservation of listed migratory species. Habitat loss, degradation, and fragmentation, driven by agricultural expansion and overexploitation (both selective and incidental hunting and fishing), represent the most widespread threats to migratory species and their habitats, according to the Red List of Threatened Species. Intensive agriculture and pesticide use negatively impact insect populations, causing food shortages for migratory birds, fish, and bats. Agricultural expansion also leads to the loss of critical wetlands and blocks the migratory paths of terrestrial mammals. Protected species have special connectivity needs that may become more specialised with climate change, so it is important that agriculture does not impinge upon the habitat of migratory species and the connective areas. Connectivity for migratory species is typically a series of 'stepping stones' protected or semi-protected areas that allow feeding and rest for migrating individuals. As habitat loss to agriculture in particular has progressed, these stepping stones have to be well managed to provide specialised resources at specific times in the migration (Hannah, 2022).

³⁶ For more information about the text of the Convention, please see: <https://www.cms.int/en/convention-text>

³⁷ For more information about the list of Parties and non-Parties, see: <https://www.cms.int/en/parties-range-states>.

³⁸ For the list of instruments and their respective websites, please see: <https://www.cms.int/en/cms-instruments/agreements>.

Adopting sustainable agricultural practices can mitigate these impacts by conserving ecological corridors and essential resting areas for migrating species. Practices, such as agroforestry, crop rotation, and the use of natural barriers can reduce soil degradation and biodiversity loss. Efforts under the CMS framework should promote sustainable agriculture to ensure that critical habitats and migratory routes remain intact, supporting both biodiversity and sustainable livelihoods (UNEP-WCMC, 2024).

The **conservation and sustainability of migratory species is a key contribution to wider aims of sustainable development** and requires global attention. The Convention and its associated instruments establish general and specific obligations for both Parties and non-Party Range States. These obligations require countries to develop national policies and legal frameworks that implement agreed protection measures for migratory species and their habitats, while also controlling activities outside critical habitats that could negatively impact those areas.

2.2. International policies

Non-binding instruments, sometimes referred to as ‘soft law’, are resolutions adopted by intergovernmental bodies as a guide for action. They may be in the form of recommendations, guidelines, programmes of action, and declarations of principles. A non-binding instrument can also be in the format of international guidelines and statements of ‘best practice’ such as a code of conduct. The strategies and instruments discussed below serve as important guides for future action in sustainable agricultural management.

2.2.1. United Nations Sustainable Development Goals

In September 2015, **world leaders came together at the historic UN Summit to adopt 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development** which came into force on 1 January 2016 (UN, n.d.c; UNGA, 2015). The SDGs are not legally binding, but governments are expected to take

ownership and establish national frameworks for the achievement of the 17 Goals (see short titles in Figure 1). Countries have the primary responsibility for implementation, follow-up, and review of progress made in implementing the SDGs, including developing monitoring systems. The timeline for meeting the various goals and associated targets is 2030.

The SDGs build upon the eight Millennium Development Goals adopted by world leaders at the UN in 2000. While there was some progress, most of the Millennium Development Goals were missed.³⁹ The SDGs and their associated targets, also applicable to all countries, recognise that ending poverty must go hand-in-hand with core economic and social strategies, while tackling climate change, biodiversity conservation, and environmental protection. Progress toward achieving each target is measured using specific indicators developed and regularly updated by the United Nations Department of Economic and Social Affairs, Statistics Division.⁴⁰

³⁹ For a post-2015 analysis, see <https://ourworldindata.org/millennium-development-goals>

⁴⁰ For a complete table of all targets and all associated indicators in one document, see: https://en.wikipedia.org/wiki/List_of_Sustainable_Development_Goal_targets_and_indicators



Figure 2: Sustainable Development Goals

Source: UN (n.d.).

Sustainable agriculture has a role to play across all 17 SDGs, mainly through the broad mandate to avoid, reduce, and reverse land degradation, which is essential for achieving all SDG goals and targets. Some of the SDGs are related to resources that are **essential inputs** for agriculture, such as SDG 6 on access to clean water, or goals to that are both affected by and contribute impacts such as SDG 13 on **climate change**.

Other SDGs directly address core issues of sustainable agriculture. For instance, Target 3 of SDG 15, Life on Land, explicitly focuses on goals to combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.⁴¹ This target also is specifically supported through UNCCD's new Land Degradation Neutrality initiative discussed above. Target 15.3 explicitly references soil and the need to restore degraded soil, an issue that is complemented in the UNFCCC decision to adopt LDN targets in part to increase political awareness that soil needs to be protected more effectively (Boer et al., 2016).

Another SDG directly linked to achieving sustainable agriculture, and thereby food security and improved nutrition, is **SDG 2, Zero Hunger**. Specifically, it aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture and create a world free of hunger by 2030.⁴² SDG 2 presents one of the most critical challenges to the goals because it requires direct, transformative changes to food systems worldwide.

SDG 2 Targets 2.4 and 2.5 are particularly relevant, as they place sustainable agriculture at the centre of the 2030 Agenda, and emphasise the urgent need for countries to develop sustainable agriculture programmes supported by comprehensive national policy and legal frameworks.

SDG Target 2.4,⁴³ Sustainable Food Production and Resilient Agricultural Practices, calls on all countries by 2030 to ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate

⁴¹ For more information on SDG 15 targets, see: https://sdgs.un.org/goals/goal15#targets_and_indicators

⁴² For further information on SDG 2, please see: <https://sdgs.un.org/goals/goal2>

⁴³ For further information on indicators, please see: https://sdgs.un.org/goals/goal2#targets_and_indicators; and SDG indicator portal: <https://www.fao.org/sustainable-development-goals-data-portal/data/>

change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.⁴⁴

To help measure progress with this target, FAO has developed a special indicator (2.4.1) stating that the overall measure of sustainable agriculture is the proportion of agricultural area under productive and sustainable agriculture, with the focus on productive agriculture (FAO, 2023). A methodological note for this indicator prepared by FAO gives guidance on construction of the indicator, including covering the “three dimensions of sustainability (environmental, social, economic)” (FAO, 2023, p. 2).

One of the most challenging aspects of this methodology was conceptualising productive and sustainable agriculture. Since sustainability encompasses multiple dimensions, it was necessary to incorporate these two aspects into the construction of the indicator. Based on research, technical meetings, pilot studies, and consultative processes held since 2016, the final version of the SDG 2.4.1 methodology was presented in 2019, introducing 11 sub-indicators, each with specific sustainability criteria. The sub-indicators are associated with land productivity, profitability, resilience, soil health, water use, fertiliser pollution risk, pesticide risk, biodiversity, decent employment, food security, and land tenure.

Indicator 2.4.1 recommends the collection of data through a farm survey, to provide countries the flexibility to identify priorities and challenges within the three dimensions of sustainability (FAO, 2023). Land determined to be under productive and sustainable agriculture will be those farms and associated agricultural land area that satisfy the sustainability criteria across all three dimensions. It also discusses the possibility of using a combination of different data sources as an alternative option for those countries wishing to do so.

The methodological note specifies that the **country construction of the indicator** must respect the following conditions:

- The indicator must reflect the priorities as they are expressed in the SDG Target 2.4 and therefore consider issues related to resilience, productivity, ecosystem maintenance, adaptation to climate change and extreme events, and soils.
- The preferred data source is the farm survey.
- The need to define productive and sustainable agriculture implies the use of criteria to distinguish between sustainable and unsustainable areas. Although these criteria are context-specific, they should be developed in reference to the proposed criteria established in the methodological note itself, ensuring they are internationally comparable.

Target 2.5, Maintain the genetic diversity of plants and animals. SDG Target 2.5 requires countries by 2030 to maintain the genetic diversity of seeds, cultivated plants, and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed.⁴⁵

These actions will be critical to **ensure that agriculture can be a sustainable activity** and ensure food security well into the long term. Important indicators include the number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities and the proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction.⁴⁶

⁴⁴ For further information on indicators, please see: https://sdgs.un.org/goals/goal2#targets_and_indicators; and SDG indicator portal: <https://www.fao.org/sustainable-development-goals-data-portal/data/>

⁴⁵ For more information, see: <https://link.springer.com/book/10.1007/978-3-030-52317-6>

⁴⁶ For more information, see: https://sdgs.un.org/goals/goal2#targets_and_indicators

An **increase in investment** will also be required, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks, to enhance agricultural productive capacity in developing countries, in particular least developed countries. The other critical aspect to meeting Target 2.5 is the adoption of measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, to help limit extreme food price volatility. An important indicator for this target is the evidence of food price anomalies.

A further requirement to meet SDGs will be the **correction and prevention of trade restrictions and distortions in world agricultural markets** through the elimination or repurposing of agricultural export subsidies and export measures with equivalent effect, in accordance with the mandate of the Doha Round on trade. An important indicator will be the reduction, elimination, and/or repurposing of agricultural export subsidies.⁴⁷

The **17 SDGs overlap with the NDCs to varying degrees**, including land use (SDG 15) and sustainable agriculture (SDG 2), showing the strongest of connections. In the case of SDG 5, these are primarily linked to SDG 15.2 (Sustainable Forest Management) and, to a lesser extent, to SDG 15.3 (Restoration of Degraded Land and Combating Desertification). **SDG 15 also addresses species and genetic resource protection, offering opportunities to collaborate with the CBD.** Regarding SDG 2 (Zero Hunger), the connections with the NDCs focus on sustainable agriculture, with few overlaps concerning genetic diversity. Moreover, NDC activities addressing SDG 2 mainly focus on climate change mitigation, even

though adaptation measures should gain more prominence as the impacts of climate change become more apparent (Dzebo et al., 2019). Furthermore, SDG 13's targets on integrating climate measures into national policies and strengthening resilience align directly with core NDC commitments under the Paris Agreement to cut emissions and adapt to climate impacts, creating a critical reinforcing mechanism between the 2030 Agenda and climate governance frameworks.

In general, since the **SDGs promote sustainable agriculture with a comprehensive approach**, that explains how multiple drivers are interconnected with each other and, consequently, the goals cannot be achieved individually (Batra et al., 2024). However, it is important to consider that the achievement of the SDGs is framed by the context of climate change and economic inequality between countries, which implies that there are greater difficulties for those nations that are more vulnerable in achieving them and adapting to climate change due to lack of resources and technical capabilities (Mugambiwa & Tirivangasi, 2016).

2.2.2. Sendai Framework for Disaster Risk Reduction

In 2015, participants at the **Third UN World Conference on Disaster Risk Reduction adopted the Sendai Framework for Disaster Risk Reduction 2025–2030**.⁴⁸ Also known as Sendai Framework, it was the first major agreement of the post-2015 development agenda to provide Member States with concrete actions that protect development gains from the risk of disaster, working alongside other international instruments with targets for 2030, including the Paris Agreement on Climate Change and the UN Sustainable Development Goals.⁴⁹

⁴⁷ For more information, see: https://sdgs.un.org/goals/goal2#targets_and_indicators

⁴⁸ For the text of the Sendai Framework, see: <https://www.undrr.org/media/16176/download>

⁴⁹ For more information on the implementation of the Sendai Framework, see: <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework#:~:text=The%20Sendai%20Framework%20focuses%20on,existing%20risk%20and%20increase%20resilience>

The Sendai Framework promotes the adoption of measures which address the **three dimensions of disaster risk from any source: exposure to hazards; vulnerability and capacity; and hazard's characteristics**, to prevent the creation of new risk, reduce existing risk, and increase resilience.⁵⁰

Linkages between natural disasters and risk to agriculture are becoming increasingly evident both through climate change impacts and biodiversity loss. A 2021 disaster risk analysis by FAO (2021) concluded that the increasing frequency and intensity of extreme weather disasters, such as floods, droughts, and mega-fires as a result of climate change, are having a devastating effect on food security and livelihoods. That report highlighted the need for stronger disaster risk reduction policies and more intense efforts, to build resilience to the adverse impacts of climate change and ensure agriculture's crucial role in achieving a sustainable future. Climate change impacts, such as wildfires, also directly threaten biodiversity, which has another significant impact for sustainable agriculture (FAO, 2021b).

The 2021 FAO report stated that **agriculture continues to be a crucial sector when it comes to disaster impact.** According to 71 post-disaster assessments between 2008–2018, agriculture, including crops, livestock, forestry, fisheries and aquaculture, absorbed 26% of the overall impact caused by medium- to large-scale disasters in low- and lower-middle-income countries. When agriculture, industry, commerce, and tourism are considered collectively, agriculture on its own bears the disproportionate share of 63% of damage and loss from disasters (FAO, 2021b, p. 9). Moreover, 82% of all damage and loss caused by drought was absorbed by agriculture in low- and middle-income countries between 2008–2018 (FAO, 2021b, p. 9). **Drought was identified as the single greatest culprit of agricultural production loss, followed by floods, storms, pests and diseases, and wildfires.**

Furthermore, it is recognised that **many least developing countries face an increasingly complex risk in their agricultural landscape** and that pursuit of this goal requires enhancement of the implementation capacity and capability of developing countries, in particular the least developed countries, small island developing States, landlocked developing countries, and African countries, as well as middle-income countries facing specific challenges, including the mobilisation of support through international cooperation for the provision of means of implementation in accordance with their national priorities.

Agriculture is not only a crucial sector due to its susceptibility to natural hazards but can also help mitigate vulnerability in various crises. For example, fostering crop diversity can strengthen access to a greater variety of food in periods of hazards, which allows for better local adaptation to a complex context of uncertainty (Engels et al., 2014). However, crop diversification and conservation are context-specific, so their benefits cannot be generalised to any territory and ecosystem (Hansen et al., 2019).

Finally, as guidance for policy and law, the Framework suggests **four main priorities** essential in achieving the 2030 goals, requiring actions within and across sectors by States at local, national, regional, and global levels:

1. Understanding disaster risk;
2. Strengthening disaster risk governance to manage disaster risk;
3. Investing in disaster reduction for resilience; and
4. Enhancing disaster preparedness for effective response, and to 'Build Back Better' in recovery, rehabilitation and reconstruction.

⁵⁰ For more information on the implementation of the Sendai Framework, see: <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework#:~:text=The%20Sendai%20Framework%20focuses%20on,existing%20risk%20and%20increase%20resilience>

2.2.3. Codex Alimentarius – Global Food Code

The Codex Alimentarius, or Food Code, is a collection of standards, guidelines and codes of practice adopted by the Codex Alimentarius Commission (CAC).⁵¹ The CAC is the central part of the Joint FAO/WHO Food Standards Programme, established by FAO and WHO. While it is not a legally binding agreement, Codex Alimentarius provides internationally recognised food standards that are usually adopted by countries as part of their national food safety regulations, making them indirectly binding within their jurisdiction. Currently, the Codex Alimentarius Commission has 189 Codex Members made up of 188 Member Countries and one Member Organisation (European Union).⁵²

The **main purpose of Codex Alimentarius is to protect consumer health and promote fair practices in international food trade** by providing science-based guidance on food safety, quality, and hygiene. Since its founding in 1963, the Codex system has evolved in an open, transparent, and inclusive way, to meet emerging challenges FAO & WTO (2017).⁵³

It is an important system for promoting globally sustainable agriculture. Compliance with Codex standards and guidelines is often a requirement for accessing international markets and participating in global food trade. For all nations and all workers in the food chains, the adoption of Codex standards can improve access to global trade and consequently lead to higher and more secure incomes, as well as improve the quality and availability of food in domestic markets. Conversely, negative impacts on livelihoods may result when countries cannot or do not apply Codex measures to ensure the environmental and nutritional safety of food (Kakar et al., 2021).

Several Codex provisions relate to agriculture.

For example, there are guidelines to minimise the environmental impact of agricultural practices on food safety and promote environmental sustainability, including on pesticides and pesticide residues (FAO & WHO, n.d.a). and the use of veterinary drugs (FAO & WHO, n.d.b) in food or feeds that moves in international trade. This includes endorsement of integrated pest management (FAO & WHO, n.d.a). The Codex also encourages the adoption of Good Agricultural Practices to promote sustainable agriculture and ensure safe and high-quality agricultural products.⁵⁴ Generally, as shaped in its Strategic Plan 2020–2025, the Codex promotes sustainable agriculture through standards by facilitating “access to knowledge of good practices and new methods and technologies in agriculture” (FAO & WHO, 2019, p. 5). The possibility of incorporating broader sustainability criteria into Codex standards would represent a significant expansion of the role of the Codex and would need to be carefully considered within the context of its mandate, expertise, procedures, structure, and the consensus of its members.

Since 1999, the Codex has also included **guidelines for the production, processing, labelling, and marketing of organically produced foods**. These guidelines aim to harmonise requirements for organic products at the international level and guide governments in establishing national regulations in this matter.

A **Codex Trust Fund** created in 2003, and supported by member contributions, plays an important role in providing financial and technical support to eligible countries. The Fund especially supports developing and transition economy countries to build stronger and sustainable national Codex systems that will make it possible to participate fully and effectively in the Codex.

⁵¹ For more information about the Codex Alimentarius, see: <https://www.fao.org/fao-who-codexalimentarius/about-codex/en/>

⁵² For more information about the members of Codex Alimentarius, see: <https://www.fao.org/fao-who-codexalimentarius/about-codex/members/en/>

⁵³ See FAO & WTO (2017), which focuses on the close relationship between food standards and trade. It describes the system governing the development and implementation of food standards. It further highlights the importance of rules, the harmonisation of regulations on the basis of international standards, and the need for countries to be prepared in order to take advantage of the system.

⁵⁴ For a list of relevant documents, see: <https://www.fao.org/fao-who-codexalimentarius/search/en/?cx=018170620143701104933%3Aq82jsfba7w&q=Good+Agricultural+Practices+to+promote+sustainable+agriculture&cof=FORID%3A9>

In the area of international trade, the WTO recognises the importance of Codex standards. In particular, the WTO Agreement on Agriculture (see [chapter 3.2.1](#)) cites the joint FAO/WHO Codex Alimentarius as the relevant standard-setting organisation for food safety with specific reference to standards, guidelines, and recommendations established by the Commission. Moreover, the WTO Agreement on Technical Barriers to Trade, while not making explicit reference, encourages members at all levels of development to participate in relevant standard-setting bodies and relies on Codex standards as the benchmark for international harmonisation in the area of food such as quality and consumer information standards.

The Codex provides science-based standards to help countries comply with the UN SDGs.

The Codex directly advances five SDGs: SDG 1 (No poverty); SDG 2 (Zero hunger); SDG 3 (Good health and well-being); SDG 8 (Decent work and economic growth); and SDG 12 (Responsible consumption and production) (WHO et al., 2020). Given that the SDGs are interconnected and mutually reinforcing, success in one of the goals can also generate change in others less directly associated with Codex work.

2.2.4. Global Framework on Chemicals

The **Global Framework on Chemicals (GFC)**, adopted at the fifth International Conference on Chemicals Management (ICCM5) in Bonn in 2023, is a voluntary, multi-stakeholder, and multi-sectoral platform. The platform aims to promote cooperation and coordination among all actors involved in the production, use, trade, and disposal of chemicals and waste. The framework is not legally binding; instead, it relies on the commitment of participating countries and stakeholders to implement its guidelines and objectives.

The objective of the Framework is to **prevent or, where prevention is not feasible, minimise harm caused by chemicals and waste to protect the environment and human health**, including that of vulnerable groups

and workers. Additionally, it seeks to promote innovation to provide better products that are safe and sustainable by design and to advance sustainable consumption and production patterns, including resource efficiency and circular economy approaches. To achieve this, it calls for the participation of all relevant sectors, including environment, agriculture, health, and labour, and stakeholders throughout the chemical lifecycle at local, national, regional, and global levels. Participants include, but not limited to, governments, intergovernmental organisations, the industrial sector, the financial sector, academia, and more.

The GFC includes **28 concrete targets to improve the management of chemicals and waste**, covering various aspects of the chemical lifecycle. Key targets include preventing or minimising adverse impacts from chemicals and waste, promoting safer alternatives to hazardous chemicals, and increasing the use of green and sustainable chemistry. **Specifically related to the agricultural sector are targets A7 and D5.** Target A7 states that by 2035, stakeholders would have taken effective measures to phase out highly hazardous pesticides in agriculture, where the risks have not been managed and where safer and affordable alternatives are available, and to promote transition to and make available those alternatives. Meanwhile, Target D5 establishes that by 2030, governments would have implemented policies and programmes to increase support for safer and more sustainable agricultural practices, including agroecology, integrated pest management, and the use of non-chemical alternatives, as appropriate.

This Framework complements other international agreements and arrangements and supports their implementation. It is aligned with the **Sustainable Development Goals**, particularly Target 2.4 on sustainable food production systems and resilient agricultural practices that help maintain ecosystems, and Target 3.9 on substantially reducing the number of deaths and illnesses caused by hazardous chemicals and air, water, and soil pollution. The sound management of chemicals and waste

will also contribute to achieving the climate objectives of the **Paris Agreement** and the goals and targets of the **Kunming-Montreal Global Biodiversity Framework**, specifically Target 7, which calls for reducing pollution to levels that are not harmful to biodiversity.

It is also aligned with the **relevant decisions on chemicals and waste management** adopted by the governing bodies of the Basel Convention

on the Control of Transboundary Movements of Hazardous Waste and Their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury, and other relevant international agreements.

Key messages of Chapter 2

1. Among the international legally binding instruments, those related to the Rio Conventions – the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD) – **offer the greatest opportunities to promote sustainable agriculture**. Due to the urgency of climate change and environmental challenges, incorporating sustainable agriculture in policies and legal frameworks have been increasing over time, compelling global political attention and, through periodic review processes, have acquired the capacity to adapt to the evolving perspectives and better promote sustainable agriculture.
2. In particular, **the Kunming-Montreal Global Biodiversity Framework presents an ambitious pathway for 2050**, which decisively includes sustainable agricultural management through various practices, including agroecology and other innovative practices. The process considers National Biodiversity Strategies and Action Plans (NBSAPs) as the primary strategic planning documents, as well as a detailed monitoring framework. These are among the most important national commitments for influencing sustainable agriculture policies.
3. The **Paris Agreement also presents one of the greatest opportunities to promote sustainable agriculture** through countries' mitigation and adaptation commitments and plans. These are reflected in the Nationally Determined Contributions (NDCs) and the National Adaptation Plans (NAPs). Given that the periodic review processes, they are flexible enough to raise ambition in commitments and strategies, as well as to address current issues – as observed in adaptation responses that are fragmented and sector-specific. The growing attention to sustainable agriculture and its link with food systems and climate action, reflected in declarations and working groups, should result in more decisive actions from countries, as well as increased funding for the nations most in need.
4. **The commitments related to desertification through the UNCCD are more limited compared to the previous conventions**, as they specifically address desertification and the effects of drought, excluding other climatic regions that also experience land degradation processes. The realisation that we are not on track to achieve Land Degradation Neutrality (LDN) provides an opportunity to promote sustainable agriculture, given all the benefits it offers for maintaining healthy soils with diversified landscapes, and raising ambitions in voluntary LDN national targets.

- 5. The other two conventions that can provide complementary support by prioritising sustainable agriculture are more focused on specific ecosystems and species critical for biodiversity.**

Sustainable agriculture plays a crucial role in ensuring the conservation, restoration, and sustainable management of wetlands, which is the objective of the Convention on Wetlands, known as the Ramsar Convention. Similarly, sustainable agriculture is essential for supporting the conservation of migratory species threatened with extinction, as outlined in the Convention on Migratory Species.

- 6. Sustainable agriculture has a role to play across all 17 of the United Nations Sustainable Development Goals (SDGs).**

Although it is a non-binding guidance for countries, it has received significant global attention since its adoption in 2015. However, since it undergoes a slower renewal process, it is not as dynamic as other frameworks, such as NDCs or NBSAPs, and is less adaptable to the rapid evolution of perspectives on how to promote sustainable agriculture.

- 7. Other international guidelines and recommendations also offer opportunities to promote sustainable agriculture from different entry points.**

Sustainable and diverse agricultural systems can mitigate vulnerability in various crises, which is why they should be an important element of the Sendai Framework for Disaster Risk Reduction. Similarly, while the Codex Alimentarius is not a legally binding agreement, it can play a crucial role in promoting sustainable agriculture through its standards and guidelines. It contributes by facilitating access to knowledge of good agricultural practices, minimising the environmental impact of agricultural practices on food safety, such as the use of pesticides or veterinary drugs, and providing guidelines on heavy metals and genetically modified organisms. Finally, the Global Framework on Chemicals specifically promotes the reduction of hazardous pesticide use in agriculture, advocating for sustainable agricultural practices like agroecology.



3. Institutions

The international governance system includes several organisations that either directly promote sustainable agriculture, or indirectly through various entry points, such as food, environment, public health, and social inclusion. This includes the following agencies: Food and Agriculture Organization (FAO); International Fund for Agricultural Development (IFAD); and the World Food Programme (WFP). Among the United Nations programmes and specialised agencies included are: the United Nations Environment Programme (UNEP); the International Labour Organization (ILO); the World Health Organization (WHO); Co-operation and Development (OECD), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC), and the High-Level Panel of Experts on Food Security and Nutrition (HLPE-FSN) and the Committee on World Food Security (CFS), among others. In the context of this paper, there are other networks of diverse global stakeholders worth mentioning, such as the Agroecology Coalition, formed as a result of the 2021 Food Systems Summit, which promotes sustainable agriculture by scaling up agroecological practices based on local and scientific knowledge.

Some institutions are directly involved in developing standards and formulating policies and strategies, affecting or important to achieving national sustainable agriculture. Others support capacity building while others monitor progress and trends globally and regionally, including in relation to advancing sustainable agriculture objectives. Still others facilitate collaboration and coordination across governments and organisations for knowledge sharing and joint action. In performing these roles, those organisations contribute to harmonising national laws and policies, and fostering cooperation in addressing shared environmental, social, and economic challenges.

This section highlights **four key international institutions involved in supporting or guiding sustainable agriculture through various roles**. The discussion focuses on the crucial role the four institutions – FAO, WTO, ILO, and OECD – play in supporting and guiding national law and policy in sustainable agriculture through the mechanisms and capacity they have pursuant to their mandates.

3.1. Food and Agriculture Organization

The Food and Agriculture Organization (FAO) of the United Nations is an intergovernmental organisation, established in 1945 and as of October 2023 with 195 members – 194 countries and the European Union – working in over 130 countries worldwide.⁵⁵ The **driving goal behind FAO's activities related to sustainable agriculture is to achieve food security for**

all, as reflected in their mandate is to improve nutrition, increase agricultural productivity, raise the standard of living in rural populations and contribute to global economic growth. FAO's vision for sustainable food and agriculture is one in which food is nutritious and accessible for everyone, and where natural resources are managed in a way that maintains ecosystem

⁵⁵ For more information about FAO, see: <https://www.fao.org/about/about-fao/en/>

functions to support current as well as future human needs.⁵⁶

Pursuant to its name, **FAO is the primary UN agency working to promote, facilitate, and assist Member States toward sustainable agriculture and food production.** It plays a crucial role in providing guidance through various means with law and policy development and implementation for sustainable agriculture. These include: assembling, analysing, and improving access to data and information; facilitating and supporting the development of normative and standard-setting instruments; promoting agri-food systems policy dialogue at multiple levels; supporting capacity development and institutional strengthening; facilitating partnerships and coalitions; disseminating knowledge and technologies; and advocating at global, regional, and national levels (FAO, 2021c).⁵⁷

The key areas of its diverse and wide-ranging work programme, as well as their leading role in guiding national law and policy for sustainable agriculture, are discussed in the next sections.

Starting with vision and guidance documents directly related to sustainable agriculture, this is followed by a brief overview of FAO's technical assistance programme to developing countries in national law and policy. These areas for action provide important guidance for Member States building or strengthening their national enabling framework for sustainable agriculture.

3.1.1. Guidance and tools

FAO Vision for Sustainable Agriculture. In 2014, after intensive consultations and discussions with leading specialists in crops, livestock, forestry, fisheries, aquaculture, and natural resources, FAO issued a report setting out a long-term vision for the agriculture sector, global to local, and the inter-sectoral collaborations needed to make agriculture more productive and sustainable. Entitled *Building a common*

vision for sustainable food and agriculture – Principles and Approaches, the report's primary audience is policymakers and others who make or influence national and institutional decisions and actions. The vision, as stated in that report, is "that of a world in which food is nutritious and accessible for everyone and natural resources are managed in a way that maintain ecosystem functions to support current as well as future human needs" (FAO, 2014a, p. 12).

The report presents **five key principles** as a guide to policymakers for advancing this vision:

Principle 1 Improving efficiency in the use of resources

Principle 2 Conserving, protecting and enhancing natural ecosystems

Principle 3 Protecting and improving rural livelihoods and social well-being

Principle 4 Enhancing the resilience of people, communities and ecosystems

Principle 5 Promoting good governance of both natural and human systems

The report explains that the "five principles provide a basis for **developing national policies, strategies, programs, regulations and incentives** that will guide the transition to an agriculture that is highly productive, economically viable, environmentally sound, and which is based on the principles of equity and social justice" (FAO, 2014a, p. 7). For emphasis, the report reiterates:

A transition to sustainable agriculture that follows the five principles requires **enabling policy, legal and institutional environments** that strike the right balance between private and public sector initiatives, and ensure accountability,

⁵⁶ For more information about sustainable food and agriculture, see: <https://www.fao.org/sustainability/en>

⁵⁷ The work of FAO results in a great number of publications, including law and policy on agriculture themes. For more information on FAO's catalogue of publications, see for example: <https://www.fao.org/3/cc7285en/cc7285en.pdf>

equity, transparency and the rule of law (emphasis added). (FAO, 2014a, p. 30)

Focusing especially on Principle 2 (Conserving, protecting, and enhancing natural ecosystems), the report lists **examples of key policies and practices** for both crop and livestock management that countries need to support with policies, laws, incentives, and enforcement.

For **crops**:

- Use better practices for biodiversity, such as in situ and ex situ conservation of plant genetic resources, integrated pest management, and others;
- Use better practices for soil, such as land rehabilitation, appropriate cropping systems and others;
- Use better practices for water management, such as deficit irrigation and preventing water pollution;
- Set payments for using and for providing environmental services, such as pollinators, carbon sequestration, and others (FAO, 2014a, p. 25).

For **livestock**:

- Conserve animal genetics in-situ and ex-situ;
- Use grassland for biodiversity, carbon storage and water services;
- Protect water from pollution through waste management;
- Use better practices for reduced emission intensity;
- Set payments for using and for providing environmental services, for example grazing fees (FAO, 2014a, p. 25).

Guidelines for Sustainability Assessment of Food and Agriculture Systems. In 2014, FAO also issued Guidelines for Sustainability Assessment of Food and Agriculture Systems (SAFA) after five years of preparatory work and extensive dialogue with Member States (FAO, 2014b). This comprehensive set of guidelines includes indicators and tools for application aimed to provide a universal framework for SAFA systems where there was none before. It was motivated by the proliferation of national sustainable development strategies, each with different voluntary sustainability standards, making any integrated, coherent approach to compliance and comparison across jurisdictions a major challenge. The SAFA Guidelines was a major effort by FAO to provide a relatively even and fair playing field for setting, applying, and implementing sustainability standards for food and agriculture across different countries and organisations.

The **focus of the Guideline is food and agriculture value chains**, which can be used at multiple levels for multiple purposes and by different actors. Through these Guidelines, all stakeholders, regardless of size, geography or role, have a clear and common language for assessing sustainability. The stakeholders include:

- **Governments, investors, and policymakers** – inform on the establishment of SDGs, to determine policy, investment, and procurement priorities, or provide global guidance on sustainable requisites for global supply chains to governments.⁵⁸
- **NGOs and the sustainability standards and tools community** – help monitor outcomes and impacts of projects, share, and learn about best practices and thresholds, undertake gap analysis.
- **Food and agriculture enterprises (individual or associations)** – evaluate

58 For more information on SAFA and frequently asked questions, please see: https://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/SAFA_FAQ_final.pdf

sustainability at the operational level and identify areas for performance improvement, undertake gap analysis, and manage or guide suppliers to improve sustainable procurement.

Because it is especially directed to policymakers, the Guidelines give special attention to the rule of law as an essential requirement for any sustainability assessment of a country's food and agricultural systems and the fundamental principle of governance in modern legal systems and relevant international agreements (FAO, 2014b). As applied to agriculture, SAFA addresses the rule of law as follows:

In the context of agriculture [...], there are several important elements: **equitable access to, and legal certainty over natural resources** on which production depends; **stakeholder participation** in decisions affecting natural resource use and access; the presence of complaints and disputes mechanisms to monitor, enforce and ensure access to justice; and the **legal empowerment** of stakeholders. (FAO, 2014b, p. 96) (emphasis added)

The Guidelines continue further states that “[w]here states and judiciaries are weak, unclear or illegitimate situations can evolve, for example concerning ownership of and access to land, clean water and other resources” (FAO, 2014b, p. 96).

The Principles for Responsible Investment in Agriculture and Food Systems, also known as RAI, is a set of principles to guide investing that can contribute to food security (CFS, 2014). The RAI were endorsed in 2014 by the Committee on World Food Security (CFS), an intergovernmental body set up in 1974 as a UN forum on the topic. The secretariat is hosted by FAO, which serves as convener of its meetings and provides technical support.⁵⁹ The Principles

acknowledge that the starting point for defining how responsible investment in agriculture and food systems can contribute to food security and nutrition is the recognition and respect for human rights. The RAI's 10 principles apply to all types and sizes of agricultural investment, all stakeholders and all stages of the value chain. These principles have a comprehensive view of sustainable agriculture, incorporating the social, nutritional, environmental, and economic dimensions of food systems. For example, it promotes investment in increasing sustainable food production, expanding food diversity, and reducing both food loss and food waste, accompanied by the promotion of sustainable consumption patterns. In addition, the principles recommend encouraging the integration of diverse traditional and scientific knowledge and incorporating their best practices and technologies.

The **Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests** (FAO, 2022b), in the context of food security, was the first comprehensive global instrument on tenure. Its implementation is to be prepared through intergovernmental negotiations. The Guidelines set out principles and internationally accepted standards of responsible practices for the use and control of land, along with guidance for improving the policy, legal, and organisational frameworks that regulate tenure rights, as well as the strengthening of capacities and operations of public and private entities concerned with tenure and its governance. They place the governance of tenure within the context of national food security.⁶⁰ These guidelines are designed to strengthen the capacities and operations of key stakeholders for sustainable agriculture, such as local authorities, producer organisations, small-scale producers, and forest users, among others. Like the RAI principles, they seek to make governmental and non-governmental actors aware of the importance of responsible investments that do not affect the environment,

⁵⁹ For more information on Committee on World Food Security (CFS), please see: <https://www.fao.org/cfs/en/>

⁶⁰ For an overview of the Guidelines, see: <https://doi.org/10.4060/i2801e>

and that protect human rights and tenure rights. In addition, these guidelines provide for spatial planning regulations that promote diversified land use under agroecological approaches.

The **International Code of Conduct on Pesticide Management**,⁶¹ approved by the FAO Conference in 2013, is the framework on pesticide management for all public and private entities engaged in, or associated with, production, regulation, and management of pesticides (FAO & WHO, 2024). The Code's standards of conduct serve as a point of reference in relation to sound pesticide life cycle management practices, especially for government authorities and the pesticide industry. Since 2007, highly hazardous pesticides are a special focus area for FAO in implementing the Code of Conduct. FAO defines as highly hazardous those:

[...] pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous. (FAO & WHO, 2014, p. 4)

The **Code contributes to the strengthening of actions around sustainable agricultural production**. For example, the Code is based on the idea that effective and efficient use of pesticides contributes to the sustainable improvement of agriculture, including the protection of public, animal, and environmental health. It establishes a series of sub-articles for the management of pesticides, taking into consideration various relevant aspect, such as pesticide formulations, packaging, and labelling,

to minimise the risk to the environment and the population. It also stipulates that governments must set Good Agricultural Practices, according to Article 2 of the Code, for each pesticide for agricultural use.

Technical guidance documents for the implementation of the International Code of Conduct on Pesticide Management were developed by the FAO/WHO Joint Meeting on Pesticide Management, to provide further guidance on implementation of the Code. Such guidelines are aimed at governments, the pesticide industry, and other stakeholders. The **Guidance on Pesticide Legislation** and the **Guidance on Pest and Pesticide Management Policy Development**,⁶² as well as the **Guidance on Highly Hazardous Pesticides**,⁶³ are among the guidelines developed in policy and legislation.

Countries may want to consult these and related FAO pesticide guidelines as they review and, as appropriate, strengthen or update national laws and policies to control, reduce, and avoid pesticide use in agriculture. Depending on the legal system, such regulations may be suitably incorporated as part of a general agricultural framework that includes law, or environmental protection, food safety, or other pollution control framework.

The **10 Elements of Agroecology Framework**, approved by FAO in 2019, was developed to assist countries in fostering transformative change. It integrates the agroecology approach as an analytical tool that serves governments to operationalise its concepts so that decision-makers, stakeholders, and key actors can use them for planning, managing, and evaluating an agroecological transition.

FAO had previously developed different programmes and guidelines related to sustainable agriculture, such as the **Sustainable Crop Production Intensification** (SCPI)

61 For the text of the Code, see: <https://www.fao.org/3/i3604e/i3604e.pdf>

62 Available in French and Spanish.

63 Available in Chinese, French, Spanish, and Turkish.

programme, the **Global Soil Partnership** (GSP), established in December 2012,⁶⁴ and the programme on **Climate-Smart Agriculture** (CSA).

The Agroecology Framework, one of the most recent programmes to promote sustainable agriculture, is comprised of the following elements:

- 1. Diversity.** Increasing biodiversity broadly contributes socially, nutritionally, environmentally, and economically. Intercropping, crop rotations, crop-livestock systems, traditional fish polyculture farming, Integrated Multi-Trophic Aquaculture, or rotational crop-fish systems are examples of good techniques and practices that encourage biodiversity in agriculture.
- 2. Co-creation and sharing of knowledge.** Collaborating with other actors and sharing knowledge allows the creation of better solutions for local challenges. The key is promoting participatory processes where all knowledge can meet, allowing participants to create mutual trust.
- 3. Synergies.** Prioritising synergies between agroecological systems allows the strengthening of multiple functions throughout the food system. For example, integrated rice systems combining rice with other products like fish improve yields, dietary diversity, and pest control among others. Another practice is the synchronisation of productive activities in time and space.
- 4. Efficiency.** Aims to improve resource-use efficiency based on planning and good synergies among different food system components. Using natural and abundant resources like solar radiation or atmospheric carbon reduces dependency on external resources, empowering producers and supporting efficiency.
- 5. Recycling.** Encourages the enhancement of biological processes to reduce costs and negative environmental impacts. For example, crop-livestock systems recycle organic material by using manure for composting.
- 6. Resilience.** Enhancing a greater capacity to recover from disturbances is key to developing sustainable food systems. For example, having diversified landscapes or reducing dependence on external inputs reduces the food system's vulnerability.
- 7. Human and social values.** Safeguarding livelihoods, promoting equity, and ensuring social well-being foster community autonomy and help create inclusive and accessible spaces for all. Addressing gender inequalities creates opportunities for women and exposes their contributions to food security, dietary, and sustainable use of biological diversity.
- 8. Culture and food traditions.** Supporting healthy, diversified, and culturally appropriate diets allows us to address food systems problems with a systemic approach. Increasing production is not enough to address the current imbalances in our food systems.
- 9. Responsible governance.** Developing governance mechanisms is necessary to create an enabling environment for food systems transformation. Some examples are school feeding, market regulations, subsidies, or incentives for ecosystem services.
- 10. Circular and solidarity economy.** Reconnecting producers with consumers produces a circular and solidarity economy with multiple benefits in the local economy and environment. Enhancing and promoting short food circuits can improve income for producers and keep fair prices.

64 For a discussion about the GSP, see: <https://www.fao.org/global-soil-partnership/about/why-the-partnership/en/>

These elements ensure a comprehensive and systemic approach to sustainable agriculture, and guides countries to operationalise and scale-up agroecology.

3.1.2. Technical assistance in law and policy

For decades, **FAO has provided an extensive programme of technical assistance, especially to developing countries, to support the implementation of sustainable agricultural policies and programmes** at the national, regional, and local levels. This includes developing action plans, strategies, and guidelines for mainstreaming sustainability principles into agricultural practices, production systems, and value chains. Among its strongest programmes is legal technical assistance based on the principle that well-designed laws and governance frameworks play a crucial role in achieving sustainable food and agricultural development and production (FAO, 2019a).

Specifically, with regards to national legal frameworks, **FAO offers legislative support to member countries, publishes legal studies and papers, and maintains databases** of national legislation and international agreements concerning food and agriculture. Key services (FAO, 2019a, p. 2) include:

- legal advisory services to member countries, regional organisations and to FAO decentralised offices, including especially through legal drafting assistance;
- ensuring the latest legislative and policy information is widely accessible through databases;
- undertaking research and studies on important and relevant legal topics; and
- supporting in-country capacity building on legal and institutional concepts and techniques.

Specific topics covered by the technical and legal support include: animal health and production, climate change; food safety and quality; pesticide management; sustainable food and agriculture; trade, including conforming national laws with WTO agreements; water management; and wildlife conservation (FAO, 2019a, p. 4).

Countries may find it worthwhile to take advantage of this **wide range of legal and technical services** from FAO as they work to strengthen their national regimes for sustainable agriculture. These legal services are available at FAO headquarters and at certain FAO decentralised locations.

3.2. World Trade Organization

The World Trade Organization (WTO), an international organisation headquartered in Geneva, Switzerland, **operates the global system of trade rules and helps developing economies build their trade capacity, including in agriculture**.⁶⁵ WTO's mandate comes from the 1986–1994 Uruguay Round of trade negotiations and earlier negotiations

under the General Agreement on Tariffs and Trade (GATT) established immediately after WWII. This resulted in the Marrakesh Agreement creating the WTO in 1995.⁶⁶ As such, it is one of the youngest international organisations, presently with 164 Member governments, representing 98% of world trade. Some 25 other governments and several international intergovernmental

65 For an overview of WTO, see: https://www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr_e.htm#:~:text=In%20brief%2C%20the%20World%20Trade,predictably%20and%20freely%20as%20possible

66 For the text of the Agreement establishing the WTO, see: https://www.wto.org/english/docs_e/legal_e/04-wto.pdf

organisations have observer status.⁶⁷ WTO virtually touches all countries and international organisations in some trade-related matter.

At the heart of WTO operations are the agreements negotiated and signed by the bulk majority of the world's trading nations. In **agriculture, WTO faces major and growing challenges** guiding an open, predictable, and fair global trading system, which needs to provide food and nutrition security for a population projected to reach some nine billion by 2050, all the while increasingly aware of sustainability needs and climate change threats.

The **WTO role in agriculture has many dimensions**,⁶⁸ from providing a platform for Member countries to negotiate trade agreements, to overseeing the process of reducing agricultural trade barriers, and regulating domestic support measures that can distort agricultural trade (such as subsidies and other forms of farm financial assistance). For example, it sets trade-related rules on food safety and animal and plant health through the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).⁶⁹ This agreement, which entered into force in 1995, is important for sustainable agriculture because it guides development and implementation of domestic food safety and animal and plant health regulations to access multi-level trade of their agricultural products, as well as trade of technologies, services and genetic material that can be critical to transition to sustainable agriculture and food systems.

In the Declaration for the 12th Ministerial Conference on SPS, WTO Members acknowledged the significant evolution of the global agricultural landscape since the SPS Agreement's adoption in 1995, which has introduced new opportunities and challenges for international trade in food, animals, and plants. These challenges include rapid technological innovation,

climate change, increasing environmental stresses on food production, and the growing importance of sustainable agricultural practices. To address these issues, the SPS Committee was tasked with the implementation of a work programme to enhance the SPS Agreement's application and identify mechanisms to tackle both current and emerging challenges.

The SPS Committee presented its key findings and recommendations at the 13th Ministerial Conference in February 2024. The report underscores the importance of promoting global food security and sustainable food systems, highlighting the need for sustainable agricultural growth and innovation in international trade. It advocates for the use of international standards from organisations, such as the Codex Alimentarius Commission, the World Organisation for Animal Health (WOAH), and the International Plant Protection Convention (IPPC), to harmonise SPS measures and protect human, animal, and plant health. It is worth noting that this work programme does not involve negotiating new obligations or amending the SPS Agreement, rather it recommends ongoing discussions on implementing the SPS Agreement in light of emerging challenges, including the Sixth Review of its operation and specific thematic sessions currently in progress.

Biodiversity is a key element in the environment-agriculture-trade system (Ortiz et al., 2021). Although the mandate of the WTO does not explicitly address biodiversity, the General Agreement on Tariffs and Trade (GATT), whose provisions and principles continue to be in force under the structure of the WTO, contains '**General Exceptions to obligations under WTO Agreements in its Article XX**'. This Article allows Members to implement measures, provided they are not applied arbitrarily, when necessary to protect human, animal, or plant life or health (Article XX(b)), or to conserve an exhaustible natural resource (Article XX(g)) (GATT, 1994).

67 For the full list of WTO Members and Observers, see: https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm

68 For more information about the 1995 WTO Agreement on Agriculture, see: https://www.wto.org/english/docs_e/legal_e/14-ag_01_e.htm

69 For the full text of the SPS Agreement, see: https://www.wto.org/english/docs_e/legal_e/15-sps.pdf

However, Members have generally had little success in defending a biodiversity-related measure due to the difficulty of demonstrating that a measure has not been applied arbitrarily or has been applied in conjunction with restrictions on domestic production or consumption, as required under Article XX(g) (GATT, 1994).

Specifically concerning developing countries, **WTO recognises the differences in economic development and capacity** between developed and developing countries and provides special provisions and flexibility to developing countries to help them to participate. This includes special treatment with agreements, longer time frames for implementation, exemptions from certain obligations, technical assistance and capacity building, and support participating in WTO decision-making processes.

WTO is central to achieving the 2030 Agenda for Sustainable Development, especially in such areas as poverty reduction, food security, health, and the environment (WTO, 2018). The UN Sustainable Development Goals (SDGs) put significant emphasis on the role that trade plays in promoting sustainable development and the contribution WTO needs to make. Progress with trade-specific SDG targets is reflected in WTO's annual reports to the UN's High-level Political Forum, the UN's main means of reviewing the 2030 Agenda for Sustainable Development (WTO, 2023a). WTO's 2023 update highlighted trade-related agricultural issues for Members' attention, including matters such as the growing freshwater limitations to production and trade and the need for government policies to promote climate-smart agriculture practices (WTO, 2023a).

3.2.1. WTO Agreement on Agriculture

Operations. The principal agreement covering multi-level trade in agricultural products is

the **WTO Agreement on Agriculture (AoA)**, which came into force in 1995 along with the WTO itself.⁷⁰ The aim of the Agreement is to strengthen the rules governing agricultural trade to improve predictability and stability for both importing and exporting countries alike. For example, in 2015, WTO negotiations under the AoA led to the historic decision to abolish agricultural export subsidies that cause distortions in agriculture markets.⁷¹ This decision contributed to addressing SDG 2 (Zero Hunger) and its Target 2.B by promoting global markets in agricultural products that are fairer and more competitive, helping both farmers and consumers, while contributing to food security.

Implementation of the AoA is overseen by the WTO Committee on Agriculture, an important mechanism for checking that WTO members are complying with their obligations on subsidies, market access and other topics important for food security, environmental protection, and sustainable agriculture. The committee works together with the WTO Trade Policy Review Mechanism to help promote transparency in the global trading system and allow different countries to scrutinise the trade policies and rural programmes of their trading partners.⁷² The AoA also provides a platform for another WTO mechanism, its Committee on Trade and the Environment, also established in 1995, to promote dialogue on the impact of agricultural trade policies on the environment and vice versa. Additionally, as part of the organisation's support, the WTO 2022 Annual Report on Technical Assistance (WTO, 2022c) elaborates on activities offered to developing country members, particularly with agricultural notifications, data collection and analyses, and advanced level training, including through workshops.

Need for agricultural trade reform. The AoA is now almost 30 years old and for the most part has

⁷⁰ For the text of the WTO Agreement on Agriculture, see: https://www.wto.org/english/docs_e/legal_e/14-ag_01_e.htm (please scroll on the index of the Agreement on the left-hand side of the webpage). In addition to substantive provisions, the Agreement in **Annex 1** lists agricultural products to which it applies in **Part XIII, Article 21**.

⁷¹ For the text of the decision, see: https://www.wto.org/english/thewto_e/minist_e/mci0_e/1980_e.htm

⁷² For information about trade policy reviews, see: https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm11_e.htm

not undergone major updates or revisions since its inception. While it is one of the most important global instruments for achieving sustainable development, and accordingly sustainable agriculture, as well as the lead global trade mechanism to address critical issues of global food and nutrition security, the Agreement has become one of the most contentious work areas of WTO (Bellmann, 2022).⁷³ There is growing recognition of the need for negotiations of new trade rules favourable to sustainable agriculture production, especially in developing countries. However, persistent stumbling blocks include the many diverse interests of Members, complexity of issues, vastly different stakeholders, uneven compliance, longstanding disputes and distrust among members, as well as a trend toward more regional and bilateral negotiations outside the WTO framework (WTO, 2022b).

AoA negotiations to better address food security, climate change, biodiversity, and sustainability have been underway for many years. An FAO report issued in 1999, only a few years after the AOA was adopted, advised then that it was so full of inequities and imbalances for the developing countries that it has brought them more problems than benefits, as their imports have increased significantly while their exports have not (FAO, 1999). The reform process began with negotiations first held in Doha, Qatar, in 2001, which became known as the Doha Round. The fundamental objective of the Doha Development Programme was to improve the trading prospects of developing countries.⁷⁴ These countries fought to protect their interests and strengthen their ability to fairly compete on the global market against strong developed and exporting economies. Negotiations on agriculture reform are at a stalemate.

At the February 2024 Ministerial Conference in Abu Dhabi, the issue of **agricultural trade reform** was back on the agenda. Despite the

leading efforts of the EU and other member governments to find compromises, the WTO was still not able to advance the reform of agriculture. According to post-conference reports, agreement could not be reached on important agricultural reforms due to wide divergences of views and unrealistic demands by some members, particularly on such issues as public stocking of food and market access, to the detriment of the most vulnerable countries who count most on the multilateral trading system.⁷⁵

Climate change threats to sustainable agriculture and thus ever-increasing threats to global food security and stability are becoming the driving forces behind efforts to reform the current trade regime. Agriculture is the most exposed and vulnerable sector to changes in temperature and precipitation, according to the 2022 WTO World Trade Report on Climate Change and International Trade, which included several trade policy findings specific to agriculture (WTO, 2022a). There are three findings that are important to highlight here, as indication of the supportive policies needed to increase international trade cooperation and improve the effectiveness of climate actions to promote and aid transitions to sustainable agriculture:

- **Climate change adaptation.** More than half (54%) of adaptation-related Aid for Trade went to agriculture in 2020, reflecting the degree to which climate change is disproportionately affecting this sector (WTO, 2022a, p. 46). Adaptation requires “identifying, preventing and reducing actual or expected climate risks, exposure and vulnerabilities, and by being prepared to cope with the effects of climate change and [minimising] unavoidable losses [...] by making adjustments to existing systems” (WTO, 2022a, p. 34). Trade policies can also be integrated into climate change

⁷³ See, for example, 2020 US Congressional Research Service (CRS) report: <https://crsreports.congress.gov/product/details?prodcode=R46456>

⁷⁴ For further information on the Doha Round, see: https://www.wto.org/english/tratop_e/dda_e/dda_e.htm#development and [https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?Query=\(%20wt/comtd/w/143/rev.*\)&Language=ENGLISH&Context=FormerScriptedSearch&languageUIChanged=true#](https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?Query=(%20wt/comtd/w/143/rev.*)&Language=ENGLISH&Context=FormerScriptedSearch&languageUIChanged=true#) (Available in French and Spanish.)

⁷⁵ See, for example, EU's post-conference assessment at https://agriculture.ec.europa.eu/news/wto-mcl3-no-agreement-agriculture-2024-03-02_en

adaptation strategies for agricultural land use. Technologies that can offset negative agricultural yield shocks include local and adapted crop varieties with higher heat or salinity tolerance, early warning system for bio-pesticide use, fertilisers, and machinery, as well as irrigation, water conservation, and storage systems. “The removal of unnecessary barriers to trade could improve farmers’ access to new technologies and reduce their exposure to climate-induced shocks” (WTO, 2022a, p. 36).

- **International trade cooperation toward a low-carbon economy.** A low-carbon economy brings considerable environmental benefits that can contribute to a more sustainable development path for agriculture. De-carbonisation through sustainable land management and forest protection can promote biodiversity, improve food security and enhance climate resilience. “The transition to a low-carbon economy is expected to change the way agricultural goods are produced” (WTO, 2022a, p. 58). International trade can contribute to a low-carbon transition by promoting the diffusion of environmental technologies. Beyond carbon, this is an opportunity to jointly promote a low carbon and nature-positive transition.
- **Measures to facilitate trade in environmental goods and services and environmental technologies** (all aiding with climate change adaptation). Examples of environmental goods and services relevant to the agricultural sector include adapted cultivars (such as cultivated varieties of plants specifically selected and

bred for distinct traits), pesticides for weed control, early warning weather systems, equipment for renewable off-grid power generation, irrigation technology, and related engineering and technical services, as well as agricultural extension services (WTO, 2022a, p. 123). Removing barriers to trade in such products and facilitating the diffusion of environmental technology can contribute to climate change mitigation and adaptation and other environmental objectives, including organic agriculture (WTO, 2022a, p. 123).

Emirates Declaration at UNFCCC COP-28.

While agricultural reform remains a work in progress, a development at the COP-28 in December 2023 in Abu Dhabi represented an encouraging first step toward concrete action. As discussed previously in [chapter 2](#), at UNFCCC COP-28, 159 world leaders endorsed the *COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action* (UNFCCC, 2023). Together these nations represent 68% (530 million) of the world’s farmers, 75% of the global population, 77% of global food production, 81% of the world’s arable land, 83% of global emissions from the food system and 83% of the world’s agricultural GDP (Davey, 2023).

The Emirates Declaration explicitly connects climate change with sustainable agriculture and food security, mentioning a role for WTO role as well. This is an encouraging step for WTO members working to update and reform the Agreement on Agriculture (WTO, 2023b). The Declaration included commitments to revisit policies and government support in such areas as subsidies in relation to GHG emissions and other environmental impacts, and called for a review of progress at the COP-29 in 2024.

3.3. International Labour Organization

The International Labour Organization (ILO) was founded in 1919 under the League of Nations and incorporated into the UN as a specialised agency

in 1946. The ILO is the first and oldest specialised agency of the UN. It has 187 Member States and is headquartered in Geneva, Switzerland,

with approximately 40 field offices around the world.⁷⁶

The **mission of the ILO is to promote social justice and internationally recognised human and labour rights** through standards setting, such as codes of practice in different fields, developing policies and programmes that promote decent work for all women and men, and thereby helping advance the economic and working conditions that give all workers, employers, and governments a stake in lasting peace, prosperity and progress.⁷⁷ The standards upheld by the ILO are broadly intended to ensure accessible, productive, and sustainable work worldwide in conditions of freedom, equity, security, and dignity.⁷⁸

ILO policy has been concerned with the situation of agricultural workers since it was founded. While the ILO does not have specific obligations related to sustainable agriculture, its conventions and recommendations continue to encompass principles that can indirectly influence agricultural sustainability, particularly concerning labour rights and social protection. Because of its focus on labour, however, ILO defines agriculture as:

[...] activities carried out in agricultural undertakings including crop production, forestry activities, animal safety and health in agriculture husbandry and insect raising, the primary processing of agricultural and animal products by or on behalf of the operator of the undertaking as well as the use and maintenance of machinery, equipment, appliances, tools, and agricultural installations, including any process, storage, operation or transportation in an agricultural undertaking, which are directly related to agricultural production. (ILO, 2011, pp. 3–4).

3.3.1. ILO Conventions and Recommendations

The **mechanism of conventions and declarations is a major tool ILO uses to contribute to international labour law.** The complex processes set in motion through the globalisation of agriculture have impacted on agricultural workers and their conditions of work and life in all regions of the world. These impacts have varied between and within regions and the specific experiences of individual countries shaped by numerous factors, including macroeconomic and trade policies. In all cases, however, the impacts on waged agricultural workers, who constitute a major part of the overall rural labour force employed in agriculture, have been significant. The agricultural labour force includes waged agricultural workers, wage-dependent small farmers and self-employed farmers.

Several ILO Conventions and Declarations are relevant to the rights and working conditions of agricultural workers, contributing significantly to sustainable agriculture. These include the *Rights of Association (Agriculture) Convention* of 1921, which guarantees association rights for agricultural workers; the *Labour Inspection (Agriculture) Convention* of 1969, which provides guidelines for the inspection of labour conditions; and the *Safety and Health in Agriculture Convention* of 2001, which aims to improve occupational safety and health in agriculture. Additionally, the *Code of Practice in Safety and Health in Agriculture* of 2011 offers further guidance on the implementation of these standards. Other significant instruments include the *Forced Labour Convention* of 1930 and its 2014 Protocol, which mandate measures to prevent forced labour, and the *Minimum Age Convention* of 1973 and the *Worst Forms of Child Labour Convention* of 1999, which aim to eliminate child labour. The *Declaration on Fundamental Principles and Rights at Work*, adopted in 1998 and amended

⁷⁶ For an overview of the ILO, see <https://www.ilo.org/global/about-the-ilo/lang--en/index.htm>

⁷⁷ For more information about the mission of ILO, see: <https://www.ilo.org/global/about-the-ilo/mission-and-objectives/lang--en/index.htm>

⁷⁸ For more information about ILO, see: <https://www.ilo.org/about-ilo>

in 2022, commits Member States to uphold principles, such as freedom of association, elimination of forced labour, abolition of child labour, non-discrimination in employment, and safe working conditions. **These Conventions and recommendations have been adopted or adapted by many countries** as part of their labour-related standards and policies. Since fair and consistent labour conditions, along with health and safety standards, are crucial for ensuring decent working conditions and long-term worker productivity, these international standards help facilitate sustainable agriculture.

3.3.2. Action Programme on Decent Work in Agriculture

In 2003, an International Workers' Symposium on Decent Work in Agriculture called upon the ILO to support the development and promotion of an **Agenda for Decent Work in Agriculture** in all relevant forums, including its Conventions, international advocacy, collaboration with the FAO, and all relevant aspects of its programme.⁷⁹ Previously, decent work for all was already the principal goal of the ILO, having launched the Decent Work concept in 1999. This symposium, which focused on labour education, laid out the details of a Decent Work in Agriculture programme and its specific rationale:

This is not the first time that *Labour Education* has focused on workers in agriculture, nor will it be the last. The fate of these women and men should remain at the top of our agenda. Not only because of their numbers, but also because of the contribution they make to all of our daily lives. Because of their crucial role in sustainable development. Because of the terrible living and working conditions under which they produce our food, while themselves often surviving on the most meagre of rations. And because their right

to decent work has yet to materialize. (ILO BWA, 2003, p. V)

The ILO Decent Work concept needed to be applied to the world's agricultural sector, if the notion of sustainable development was to have any real and concrete expression. There are several critical relationships underlying the discussion of decent work in agriculture in which waged agricultural workers are directly and indirectly involved (ILO, 2003). Firstly, there is the connection between poverty reduction efforts and sustainable agriculture, since waged agricultural workers comprise a high proportion among poverty-affected groups. Secondly, and related to the first, concerns the relationship between rural incomes, livelihoods, and food security. Thirdly, there are **linkages that exist between all the key policy areas** – sustainable agriculture, incomes, poverty reduction, and food security – which impact the situation of waged agricultural workers. The conditions of waged agricultural workers are in turn considerably important in defining the overall policy context.

In 2004–2005, pursuant to these developments, ILO launched Action Programmes targeting a few sectors including agriculture. As part of this initiative, the **Action Programme on Decent Work in Agriculture** was launched to improve occupational safety and health (OSH) in agriculture (de Luca et al., 2012). Activities to promote the programme were carried out at the national, enterprise and/or local community levels, depending on the interest of the constituents. National level activities emphasised improvements in the legal, regulatory or policy framework governing safety and health in agricultural workplaces. Enterprise-level activities comprised the delivery of large-scale training programmes for safety managers and workers' safety representatives from a large number of agricultural enterprises. Community-level activities involved the adaptation of the WIND (Work Improvements in Neighbourhood

⁷⁹ For more information about decent work in agriculture, see: https://www.ilo.org/wcmsp5/groups/public/@ed_dialogue/@actrav/documents/publication/wcms_111457.pdf

Development) methodology to local conditions and spreading knowledge of basic safe work practices to rural communities.⁸⁰

International labour standards are critical to ensure a rights-based approach to the transformation in the rural economy to be inclusive, sustainable, and resilient. The implementation of such standards is at the heart of the capacity of rural economies to recover from the impact of crises. This includes ensuring the respect of fundamental principles and rights at work, as well as the promotion of the ratification and application of international labour standards relevant to the promotion of decent work in the rural economy.⁸¹

Overall, sustainable agriculture can prevent and mitigate harm to producers and farmworkers. This enhances their livelihoods and life conditions, which improves their capabilities for adopting, for example, diversification strategies, and getting more resilient in the process (Fairtrade International, 2022). In addition, it must be considered that agriculture is one of the most dangerous occupations. A sustainable agriculture approach recognises this condition and promotes better conditions for public and environmental health, consumer food safety, or better protection from pesticides and agrochemicals, while promoting working unions through organisations or committees (FAO et al., 2007).

3.4. Organisation for Economic Co-operation and Development

The **Organisation for Economic Co-operation and Development (OECD)** is an international association of 38 countries from Europe, the Americas, and Asia, helping Member countries formulate economic and social policies, including in agriculture.⁸² Its focus is on market-based economies where countries collaborate to develop policy standards to promote sustainable economic growth. As such, it provides a unique forum and knowledge hub for data and analysis, exchange of experiences, best-practice sharing, and advice on public policies and international standard-setting, including in matters pertaining to sustainable agriculture. OECD members, mostly from Europe, and its key partners together represent more than 100 countries worldwide comprising more than 80% of world trade.⁸³ Furthermore, the OECD and its partners include most of the major food and agriculture producers, which make them pivotal in addressing issues of agricultural sustainability (OECD/FAO, 2024). Initially, the Organisation for European Economic Co-operation was

founded in 1948 to run the Marshall Plan for the reconstruction of Europe after World War II. After its completion, Canada and the United States joined and the organisation was reconstituted in 1961 as Organisation for Economic Co-operation and Development (OECD), its current name.

OECD is included in this section because their multiple agriculture-related initiatives and outputs could offer insights for other countries on best practices and lessons learned. OECD guidance and technical assistance could also serve as valuable resources for developing countries seeking to advance their agricultural sector in a manner that is economically viable, socially inclusive, and environmentally sustainable. OECD-sponsored conferences and workshops for policymakers, industry, and the academia could also help keep these communities informed of innovative research, scientific developments and opportunities for achieving sustainable agriculture. Many OECD workshops and seminars aim to provide training

80 For more information about the WIND approach, see: https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@safework/documents/instructionalmaterial/wcms_241020.pdf

81 For more information about the WIND methodology, see the evaluation report at: <https://www.ilo.org/media/320941/download>

82 For more information about OECD and agriculture, see: <https://www.oecd.org/en/topics/agriculture-and-sustainability.html>

83 For information on OECD's Members and work, see: <https://www.oecd.org/en/about.html>

and technical advice to countries and regions on capacity building in law and policy, governance, and the rule of law on topics addressed by OECD.⁸⁴

Overall, **one of OECD's objectives is to help countries improve the sustainability of agriculture, and this includes monitoring environmental performance in agriculture** (see OECD, 2023). In that role, its focus spans sustainable agriculture indicators, green growth, climate change, biodiversity and ecosystems, water use, and innovation.⁸⁵ Its work includes identifying successful agricultural policies that mitigate the negative environmental impacts while enhancing the positive ones and providing recommendations on how to improve policy coherence for environmental performance of the agricultural sector.⁸⁶ OECD has developed specific policy recommendations on such issues as how to pursue cost-effective agro-environmental policies, manage water issues for agriculture, deal with climate change challenges, and preserve biodiversity and manage ecosystem services related to agriculture.

One of **OECD's major initiatives in sustainable agriculture is its Co-operative Research**

Program: Sustainable Agricultural and Food Systems. This programme aims to strengthen scientific knowledge, give scientific information and provide advice to inform future policy decisions related to the sustainable use of natural resources in the areas of agriculture, food, fisheries and forests. An emphasis on policy is integrated in all activities funded, relating to sustainable agriculture to support policymakers in advancing that goal.⁸⁷

In recent years, the OECD has observed encouraging signs that the **agriculture sector of OECD countries can meet its environmental challenges**. In particular, farmers in many OECD countries have made improvements in the use and management of nutrients, pesticides, energy and water, using less of these inputs per unit of land. Farmers have also made good progress in adopting more environmentally beneficial practices, such as conservation tillage, improved manure storage, or soil nutrient testing.⁸⁸ It has also developed insights on the potential environmental impact of agriculture policies by identifying various policy misalignments and how to jointly address sustainability and productivity growth goals.

Key messages of Chapter 3

1. In recent decades, environmental threats primarily related to climate change mitigation and adaptation, as well as increased awareness of the negative environmental and social impacts of conventional agriculture, **have led various international institutions to increasingly emphasise the need to transition toward more sustainable agriculture.**
2. **The international governance system includes several organisations that either directly promote sustainable agriculture or do so through various entry points,** such as food, environment, public health, and social inclusion. This includes the Rome-based agencies (FAO, IFAD, and WFP), other United Nations agencies (such as UNEP and ILO), specialised agencies (like WTO and WHO), as well as development banks (such as the World Bank and other regional

⁸⁴ See, for example, several examples from the Middle East and North Africa region at: <https://www.oecd.org/mena/governance/rule-of-law/>

⁸⁵ For an overview of OECD and agriculture, see: <https://www.oecd.org/en/topics/agriculture-and-sustainability.html>

⁸⁶ For more information about related policy issues, see: <https://www.oecd.org/en/topics/agriculture-and-sustainability.html#related-policy-issues>

⁸⁷ For more information about the programme, see: <https://www.oecd.org/agriculture/crp/>

⁸⁸ For more information, see *Measuring the Environmental Performance of Agriculture Across OECD Countries* and *OECD data statistics for Member countries*

banks). Additionally, there are organisations focused on developing policy guidance, disseminating successful practices, and/or developing metrics, such as OECD, HLPE-CFS, IPBES, and IPCC, among others.

3. Unlike certain international conventions,⁸⁹ which are binding, actions promoted by other organisations⁹⁰ are not necessarily binding.

They represent a broad range of actions and have different impacts on sustainable agriculture policies. These encompass: technical assistance, capacity building, and guidance for countries to develop national laws and policy frameworks, such as those provided by FAO; binding global trade agreements such as those promoted by the WTO; recommendations and metrics such as those from OECD; and standards and capacity building such as those from ILO.

4. FAO, the organisation with the clearest mandate on the issue, has promoted a wide range of approaches to advance sustainable agriculture in the last decades.

While in the past it focused on schemes, such as sustainable crop production intensification and climate-smart agriculture, it is now also active in promoting organic agriculture and agroecology. It has been incorporating more systemic views on sustainable agriculture, as well as providing technical and legal assistance to improve national frameworks.

5. The trade agreements and rules promoted by the WTO have a direct impact on

how countries develop their agricultural policies. Since they are binding, legal commitments are made regarding agricultural subsidies and incentives, thus defining trade-related rules on food safety and plant and animal health, potentially fostering a greater transition to sustainable agriculture. However, the WTO's Agreement on Agriculture (AoA), which came into force in 1995, has been criticised for its inequities and imbalances affecting developing countries. Although there is growing recognition of the need for new rules favourable to sustainable agriculture, reform has been challenging. Climate change threats to agriculture, and their related threats to global food security and stability, provides an opportunity for reform.

6. From the perspective of agricultural workers, the ILO has been advocating for over a century through conventions and declarations to improve their working conditions. Since the early 2000s, its agenda for decent agricultural work has had the potential to incorporate greater commitments and guidelines to promote sustainable agriculture.

7. OECD provides a unique forum and knowledge hub for countries to collaborate on developing policy standards and monitoring environmental performance in agriculture. Since its members and partners include most of the major food and agricultural producers, they are critical in promoting sustainable agriculture.

⁸⁹ See chapter 1.

⁹⁰ See chapter 2.



4. Regional instruments and sustainable agriculture

This chapter consists of two topics. The first covers key elements of the European Union (EU) and its policy and law frameworks regarding the promotion and support to sustainable agriculture in the European Community. Most of the discussion are reflected in the main EU agricultural policy, called the Common Agriculture Policy (CAP), a comprehensive, overarching policy framework supporting farmers to ensure quality and affordable food to the Community produced in a sustainable and environmentally safe way. Supplementing this major instrument are several associated EU policies and laws also noted in this section to illustrate how agricultural policy is part of a set of interconnected sector policies that need to support and reinforce each other, a feature particularly critical for a country transitioning to sustainable agriculture, as stressed in the Introduction.

The second topic turns to regional trade agreements (RTAs) in agriculture, a growing trend in international trade. Such agreements are a relatively recent law and policy approach supplementing the multilateral trade system overseen by the WTO (discussed in [chapter 3.2](#)). They may be at bilateral or regional levels, with varying degrees of attention to sustainability issues, but are now part of the trade portfolio of virtually every Member State of the WTO.

These two topics were included in this report because of their significant and growing roles in **supporting or otherwise impacting country**

efforts to advance sustainable agricultural programmes. The purpose of the EU coverage is to offer highlights of the evolving EU experience with agricultural policy that may provide insights, lessons or elements of best practice that are useful for non-EU countries as they work to develop domestic sustainable agricultural policies, laws, and programs. Additionally, the European Union plays a significant role as it is the largest importer and exporter of food worldwide (Allen et al., 2018). At the same time, the EU has the potential to use its free trade agreements, like the Economic Partnership Agreements (EPAs), to promote a sustainable agenda, especially with neighbouring countries.⁹¹ Another example is sustainable certifications like the Regulation on Deforestation Free Products (EUDR),⁹² which can introduce challenges for producers in developing countries to achieve sustainability objectives but could have a critical impact on the long term.

Similarly, the brief overview of RTAs in agriculture is intended to offer insights and lessons learned through existing RTAs on important elements to consider in the context of reinforced national sustainability goals, especially in agriculture, as countries pursue economic and social development through trade in agricultural products.

The subsequent sections highlight key considerations most relevant for this report and its potential audiences.

91 For more information about the EU's support for developing countries, see: https://policy.trade.ec.europa.eu/development-and-sustainability/support-developing-countries_en

92 For more information about the EU's EUDR, see: https://green-business.ec.europa.eu/deforestation-regulation-implementation_en

4.1. European Union

The **European Union (EU)** is a **political and economic union**, composed of 27 Member States located in Europe, representing an estimated population of over 448 million as of 2024.⁹³ The EU traces its origins to the aftermath of World War II when European leaders sought to build economic cooperation and prevent future conflicts, initially through formation of the European Economic Community created by the Treaty of Rome in 1957, which form the basis for what is now the Treaty on the Functioning of the European Union, or TFEU.⁹⁴ The European Union was officially created the successor of TFEU in 1992 by the Treaty on European Union (or Maastricht Treaty) to further the political unification of Europe. The TFEU along with the Treaty on European Union (TEU) are the two primary treaties of the EU.

The **EU has evolved into a unique supranational governance entity with its own institutions, laws, and policies**, respecting Member States' sovereignty and diversity while pursuing integration, cooperation, stability, peace, and prosperity among the members.⁹⁵ The EU's main economic engine is the single market, enabling goods, services, money and people to move freely.

Several institutions are involved in EU decision-making, amongst them:

- the European Parliament, which represents the citizens of EU Member States and is directly elected by them;
- the European Council, which consists of the Heads of State or Government of the EU Member States;
- the Council of the European Union (also called the Council), which represents the governments of the EU Member States;
- the European Commission, which represents the interests of the EU as a whole;
- the Court of Justice of the European Union (CJEU), which ensures the application and uniform interpretation of EU law;
- the European Central Bank (ECB), which manages the euro and monetary policy for the Eurozone;
- the European Court of Auditors (ECA), which checks the finances of the Union;
- the European Committee of the Regions (CoR), an advisory body composed of locally and regionally elected representatives from all Member States;
- the European Economic and Social Committee (EESC), an advisory body comprising representatives of workers' and employers' organisations and other interest groups.

Generally, the **European Commission proposes new laws, and the Parliament and the Council adopt them**. Consultations among these institutions are called the 'trialogue'. In the EU decision-making system, a 'directive' is a legislative act that sets out a goal that all EU countries must achieve. However, it is up to the individual countries to devise their own laws on how to reach these goals. An EU regulation, in contrast, is a binding legislative act that must be applied in its entirety across the EU.

⁹³ For an overview of the European Union, see [The European Union – What it is and what it does](#).

⁹⁴ For more information about TFEU, see: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:i2012E/TXT:en:PDF>

⁹⁵ According to World Bank income classifications, as of 2023, no EU Member States were low-income countries or low-middle income; all were in the upper-middle or high-income classification. For more information about the World Bank classification, see: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

From the beginning, agriculture was one of the leading areas of interest and activity in the EC and then EU. The EU's Common Agricultural Policy (CAP), launched in 1962, guides today's agriculture and the sustainability of this sector for all EU members.⁹⁶ It is the oldest EU policy still in operation.

4.1.1. Common Agricultural Policy

Goals and objectives. The EU CAP is a set of rules adopted to provide a unified policy on agriculture in EU countries that has undergone significant evolution over the last sixty years, with sustainability becoming an increasingly central focus. Created in 1962 by the six founding countries of the then European Communities, it is the oldest EU policy still in operation. As with all sectors, the CAP is governed by articles of the TFEU mentioned above. CAP's objectives are:⁹⁷

- to increase **agricultural productivity** by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of the factors of production, in particular labour;
- to ensure a **fair standard of living for the agricultural community**, in particular by increasing the individual earnings of persons engaged in agriculture;
- to stabilise **markets**;
- to assure the availability of **supplies**;
- to ensure that supplies reach **consumers at reasonable prices**.

These have both **economic and social dimensions**, and are envisioned to safeguard the interests of producers and consumers. They

have remained unchanged since the Treaty of Rome, attesting to the flexible wording that has enabled countless reforms since the 1980s.⁹⁸

Through the CAP, **European farmers can rely on public support** to ensure qualitative and affordable food to the Union. This support has continued due to the following considerations unique to agriculture, as compared to other businesses:⁹⁹

- despite the importance of food production, **farmers' income is around 40% lower** compared to non-agricultural income;
- agriculture depends more on the **weather and the climate** than other sectors;
- there is an **inevitable time gap** between consumer demand and farmers being able to supply – growing more wheat or producing more milk inevitably takes time;
- while being cost-effective, farmers should work in a **sustainable and environmentally friendly** manner, and maintain our soils and biodiversity.

Pursuant to EU CAP regulations, **agricultural activity has been defined** to mean:¹⁰⁰

- production, rearing or growing** of agricultural products, including harvesting, milking, breeding animals, and keeping animals for farming purposes;
- maintaining an agricultural area** in a state which makes it suitable for grazing or cultivation without preparatory action going beyond usual agricultural methods and machineries, based on criteria set by Member States based on a framework established by the Commission, or

⁹⁶ For more information on CAP, see https://agriculture.ec.europa.eu/common-agricultural-policy_en

⁹⁷ For more information about TFEU, Article 39, see https://eur-lex.europa.eu/eli/treaty/tfeu_2016/art_39/oj/eng. Recent EU regulations further elaborate the definition of agriculture for purposes of regulation in the agricultural sector. Specifically, Regulation (EU) 1307/2013. See text at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1307>

⁹⁸ For more information about the CAP, see: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en

⁹⁹ For a discussion on CAP in Practice, see: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en

¹⁰⁰ For the text of Regulation (EU) 1307/2013, Title 1 (scope and definitions), Article 4, see: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1307>

- iii. **carrying out a minimum activity**, defined by Member States, on agricultural areas naturally kept in a state suitable for grazing or cultivation.

4.1.2. How the CAP functions

CAP operations. The CAP is currently managed and funded at the European level from the resources of the EU's budget, structured into two funding pillars: the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD). These funds have two main functions: to provide: i) direct support to farmers; and ii) support for market measures that benefit farmers.

Direct support is provided through payments directly to farmers, offering a 'safety net' of funds to run their agricultural activities. Direct support is based on certain conditions:

- In return for **maintaining food safety, environmental standards, and animal welfare** standards, farmers receive income support;
- Farming activities are **maintained throughout the EU and adapted to local conditions**;
- In response to market signals, producers produce **goods that consumers demand**;
- **If farmers do not comply** with certain public health, animal welfare, and environmental requirements, their support may be reduced or eliminated thanks to the 'conditionalities' required to receive these direct payments.¹⁰¹

In response to price volatility in EU agricultural markets, rules have been introduced for the

sector's special challenges – global competition, economic and financial crises, climate change, and unstable costs of production from such imports as fuel and fertiliser. To ensure diversity, availability, affordability, and safety of agricultural products through the Common Market Organization, these rules involve:

- Making **specific policy tools** that help improve the functioning of agricultural markets based on the rules for the common market in goods and services;
- Setting out the **parameters for intervening** in agricultural markets and providing sector-specific support;
- Including **rules on the marketing** of agricultural products and functioning of producer and inter-branch organisations;
- observing international **trade and competition** rules.¹⁰²

The current CAP 2023–2027. As noted earlier, the policy and programmes of the CAP have undergone significant evolution for more than sixty years, to meet changing needs and new priorities. Table 1 presents the highlights of this evolution.

The mandate and core institutions of the CAP continue to provide the framework for its evolving priorities and operations. **The current CAP 2023–2027 aims to respond more directly to environmental sustainability, social responsibility, and economic viability.** The modernisation of the CAP process may offer insights and lessons that other countries may find instructive as they transition towards a sustainable agriculture.

¹⁰¹ For the text of Regulation (EU) 2021/2116 on the financing, management and monitoring of the CAP, see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0187.01.ENG

¹⁰² For more information about Regulation (EU) 2021/2117 establishing a common organisation of the markets in agricultural products, see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0262.01.ENG

Table 1 European Union agriculture through 60 years of the Common Agricultural Policy

1962 – Birth of the CAP	Post WWII Europe took steps toward a peaceful and unified future. European Communities (six founding countries) took steps toward a 'common approach to agriculture' to guarantee food supplies at affordable prices, to secure farmers an adequate income, and to stabilise markets. The CAP provided subsidies to European farmers based on how much they could produce, referred to as 'coupled' payments.
1960s/1970s – Modernisation	Initial policies increased food productivity and availability, but income to farmers remained stagnant despite support. This led to the first CAP reform with support policies to optimise the area of land under cultivation and merge farms to create larger units.
1984 – Market interventions, quotas	During the 1970s and early 1980s, agricultural production started to exceed demand, leading to over-production of surpluses (e.g. in butter and dairy), environmental degradation, and budgetary pressures. The second CAP reform in 1984 introduced a quota system for products, such as milk, to limit production and better manage supplies.
1992 – Environmental reforms	CAP reforms to promote more sustainable practices. The MacSharry Reform (1992) introduced policies to set aside land or limit agricultural production.
Agenda 2000 – Adding rural development	Formal recognition of the need for rural development support as part of agricultural development; 'quality' of agri-food products took priority over quantity and became an obligation to offer the consumer a product that was good from both nutritional and health/hygiene point of view. Expansion of the CAP added a new second 'pillar' dedicated to rural development (European Agricultural Fund for Rural Development); this was added to the first pillar (European Agricultural Guarantee Fund) which was already providing direct payments to farmers. Direct support to farmers was shifted to the size of their farm, and not to the quantity produced.
2003 – Focus on environmental protection	The main reform that changed the direction of CAP aimed for more competitiveness in agriculture, less protective rules, and prices closer to world market prices. A move to decoupled farmer support so that payments would be linked to eligible hectares regardless of intensity of agricultural activity. Introduced 'eco-conditionality'; to receive direct payments, farmers need cross-compliance – maintaining but adhering to agricultural and environmental standards.
2013–2014 – Greening agriculture	Further CAP reforms; 30% of direct subsidies are now granted for sustainable land use: 'greening' of direct payments to make land more sustainable; more equitable distribution of support; limiting the budget for big farms; additional support for smaller farms; incentives for young farmers. Response to new concerns, such as climate change, animal welfare, food safety, and sustainable resource use.
2018–2020 – Adoption of new reforms for 2023–2027; fairer, greener, more performance-based policy	Introduction of a decentralised approach to resource allocation. Member States to prepare CAP National Strategic Plans for using EU funds. Plans must reflect goals of the EU Green Plan, Field to Food (F2F) programme, and biodiversity strategies, and assessed on environmental and climate criteria.
2027 and beyond – A new vision post-2027	The European Commission has presented its Vision for Agriculture and Food, ¹⁰³ which builds on the results of the Strategic Dialogue for the Future of EU Agriculture ¹⁰⁴ beyond the current programming period, following the presentation of the new draft Multiannual Financial Framework (MFF) for 2028–2034 ¹⁰⁵

Source: Council of the EU & European Council (n.d.)

¹⁰³ For more information about the Vision, see: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0075>

¹⁰⁴ For more information, see: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0075>

¹⁰⁵ For more information, see: https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034_en

On 2 December 2021, after years of negotiation, a **new legal agreement was formally adopted reforming the EU's Common Agricultural Policy**. The legislation (in three parts¹⁰⁶), entered into force on 1 January 2023, is intended to achieve a fairer, greener, and more performance-based CAP.¹⁰⁷ The new policy recognises the central role of agriculture in advancing the 2019 European Green Deal, including its Farm to Fork (F2F) Strategy and the EU Biodiversity Strategy for 2030 (adopted in 2020), discussed in the next sections.

The following are the **10 key policy objectives of the 2023–2027 CAP (EU, n.d.) that are linked to common EU goals for social, environmental, and economic sustainability in agriculture and rural areas**:

- i. ensure a fair income for farmers;
- ii. increase competitiveness;
- iii. improve the position of farmers in the food chain;
- iv. climate change action;
- v. environmental care;
- vi. preserve landscapes and biodiversity;
- vii. support generational renewal;
- viii. maintain vibrant rural areas;
- ix. protect food and health quality;
- x. foster knowledge and innovation.

A major change with the current CAP policy was the shift to decentralised decision-making when deciding allocation of the EU's financial resources. The **new CAP requires Member States to prepare their own CAP National Strategic Plans** for resources from the two EU funds, the EAGF and EAFRD. Each EU member was to submit its CAP National Strategic Plan so that the process of Plan review and budget allocation could begin with entry into force of the new legislation in January 2023.

The **rationale for decentralisation was to better target resources to local State-defined priorities** without undermining the

overall 'common' nature of the policy. For the National Strategic Plans, Member States were to undertake internal assessments and identify national and regional needs based on CAP's objectives and the European Green Deal, with CAP and the Green Deal being the two new fundamental components to achieve sustainable development, address climate change, and promote environmental protection. Member States were required to clarify how their National Strategic Plans would achieve these European Green Deal goals, as well as advance the EU Farm-to-Food and biodiversity strategies. The European Commission has a co-management role with Member States on implementation.

CAP 2023–2027 legislation includes specific provisions to guide compliance with the European Green Deal's environmental goals.

For example, 51% of the first funding pillar, the European Agricultural Guarantee Fund, must be dedicated to 'Basic Income Support for Sustainability'. These are the main payments to EU farmers based on eligible farm hectares, a new requirement for 'cross-compliance', meaning they must meet the environmental requirements to be eligible to receive income support. CAP support also is now linked to social and labour rights of agricultural workers. Farmers must provide their workers with a written description of the agreed working conditions and will have to ensure a safe and healthy working environment.

The application of this approach began in 2023 on a voluntary basis and has become mandatory in 2025. CAP payments will be reduced in the event of non-compliance. Another key area of reform is the **introduction of an 'eco-scheme' regime** to support transition toward a sustainable food system, while strengthening farmers' contributions to the EU climate and environmental protection objectives. Member States are to set up eco-schemes in their CAP strategic plans, and the European Commission

¹⁰⁶ For the text of the three laws, see: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7639

¹⁰⁷ For an overview of the CAP 2023–2027, see: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27_en#:~:text=The%20new%20legislation%2C%20which%20entered,and%20more%20performance%2Dbased%20CAP

is to assess and approve their relevance to meeting the European Green Deal targets.

The **targets specified in the eco-scheme** are:

- Reduction by 50% the overall use and risk of **chemical pesticides** and reduce use by 50% of more hazardous pesticides by 2030;
- Achievement of at least 25% of the EU's agricultural land under **organic farming** and a significant increase in **organic aquaculture** by 2030;
- Reduction of sales of **antimicrobials** for farmed animals and in aquaculture by 50% by 2030;
- Reduction of nutrient losses by at least 50% while ensuring no deterioration in soil fertility; this will **reduce use of fertilisers** by at least 20% by 2030;
- Return of at least 10% of agricultural area under **high-diversity landscape** features by 2030.¹⁰⁸

This **regime is compulsory for Member States and voluntary for farmers**. States are required to implement their approved National Strategic Plans which can be changed and adapted. They are also required to allocate 25% of their budget for direct payments and identify the list of eco-schemes they intend to propose to their farmers. This means that the farmer's 'Basic Income Support for Sustainability' income (noted above) is from now on integrated in the budget for adoption of the eco-scheme. It is at the discretion of individual farmers whether to adopt one or more eco-schemes. The regime is considered to be a soft measure by some environmental observers, as contrasted with more strict measures, such as regulations or

carbon pricing, to reduce GHG and promote sustainable practices.

The **new CAP policy is in its initial phase of implementation and its effectiveness is already being monitored**. Issues for attention include transparency and accountability, as well as the appropriate methods to use for the evaluation of plans and eco-schemes. Other more difficult substantive questions include the adequacy of the eco-scheme approach for addressing the biodiversity crisis, particularly the impacts of intensive agriculture and loss of habitats and species, and whether the new requirements are sufficiently clear and strong to properly calculate budget needs for advancing the European Green Deal objectives.¹⁰⁹

The CAP reform timeline (from 2023 through 2027) already factors in periods of assessment and performance review on each CAP National Strategic Plans.¹¹⁰ As the CAP history shows, the governance structure of the CAP provides for adaptation, normally by requiring a series of future meetings to evaluate results and consider areas for improvement. National Strategic Plans can be changed and adapted. According to some analysts, this process provides an opportunity for the new CAP to be a 'game changer' that will put the European agri-food system on a more sustainable path (Willard, 2023).

4.1.3. Other key EU Policies

The **Common Agricultural Policy (CAP) of the European Union intersects with several other environmental policies and programmes which together advance the EU's comprehensive and integrated approach to sustainable agriculture**. The policies range from environmental protection and climate change to biodiversity and nature restoration. This assembly of intersecting policies reinforce and support the CAP policy in an integrated

¹⁰⁸ For information about the European Commission's list of potential agricultural practices that eco-schemes could support, see: https://www.agroecology-europe.org/wp-content/uploads/2021/05/factsheet-agri-practices-under-ecoscheme_en.pdf

¹⁰⁹ For the full text of the European Green Deal, see: https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF.

¹¹⁰ See *The European Green Deal*, p. 4, Article 2, Transforming the EU's Economy for a Sustainable Future.

platform so that the CAP is not working in isolation, rather is part of a comprehensive set of interconnected sector policies each doing its part to advance sustainable development and sustainable agriculture. As advised in the introduction, with so many sectors of national policy having an impact on or being impacted by agricultural policy, integration across sectors is critical for achieving sustainable agriculture and, more broadly, the UN Sustainable Development Goals.

Although some of the policies in the next paragraphs are now explicitly incorporated into the CAP guidance and requirements, such as the European Green Deal, the **discussion focuses on aspects especially pertinent to achieving sustainable agriculture through the CAP**. It begins with the European Green Deal, the core supporting pillar along with the CAP for supporting EU's efforts toward sustainable development. The section concludes by enumerating other EU environmental instruments that interface with and reinforce the CAP as it pursues its goal of advancing sustainable agriculture in the EU member countries.

The European Green Deal

In December 2019, the European Union **launched the European Green Deal strategy** in response to growing concerns about climate change, environmental degradation, the EU food system, and associated social and economic impacts.¹¹¹ The rationale is described as follows:

To **deliver the European Green Deal**, there is a need to rethink policies for clean energy supply across the economy, industry, production and consumption, large-scale infrastructure, transport, food and agriculture, construction, taxation and social benefits. To achieve these aims, it is essential to increase the value given to protecting and restoring natural ecosystems, to the sustainable use of resources and to improving human health. This is where transformational change is most needed and potentially most beneficial for the EU economy, society and natural environment.¹¹²

The **European Green Deal contains many elements** (see Figure 2) and was considered an integral part of the European Commission's strategy to implement the UN 2030 Agenda and SDGs.¹¹³

Among the **elements directly related to the CAP and sustainable agriculture** are two substantive initiatives explained in the corresponding sections of the European Green Deal:

- **Farm to Fork**, designing a fair, healthy and environmentally friendly food system (Article 2, section 2.1.6);
- **EU Biodiversity Strategy 2030**, pursuant to commitments under the Convention on Biological Diversity to halt biodiversity loss and ensure that the EU plays a key role (section 2.1.7).

¹¹¹ For the full text of the Green Deal, see: https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF.

¹¹² See *The European Green Deal*, p. 4, Article 2, Transforming the EU's Economy for a Sustainable Future, 2.1, Designing a set of deeply transformative policies.

¹¹³ See *The European Green Deal*, p. 2, Article 1, Introduction – Turning an urgent challenge into a unique opportunity.

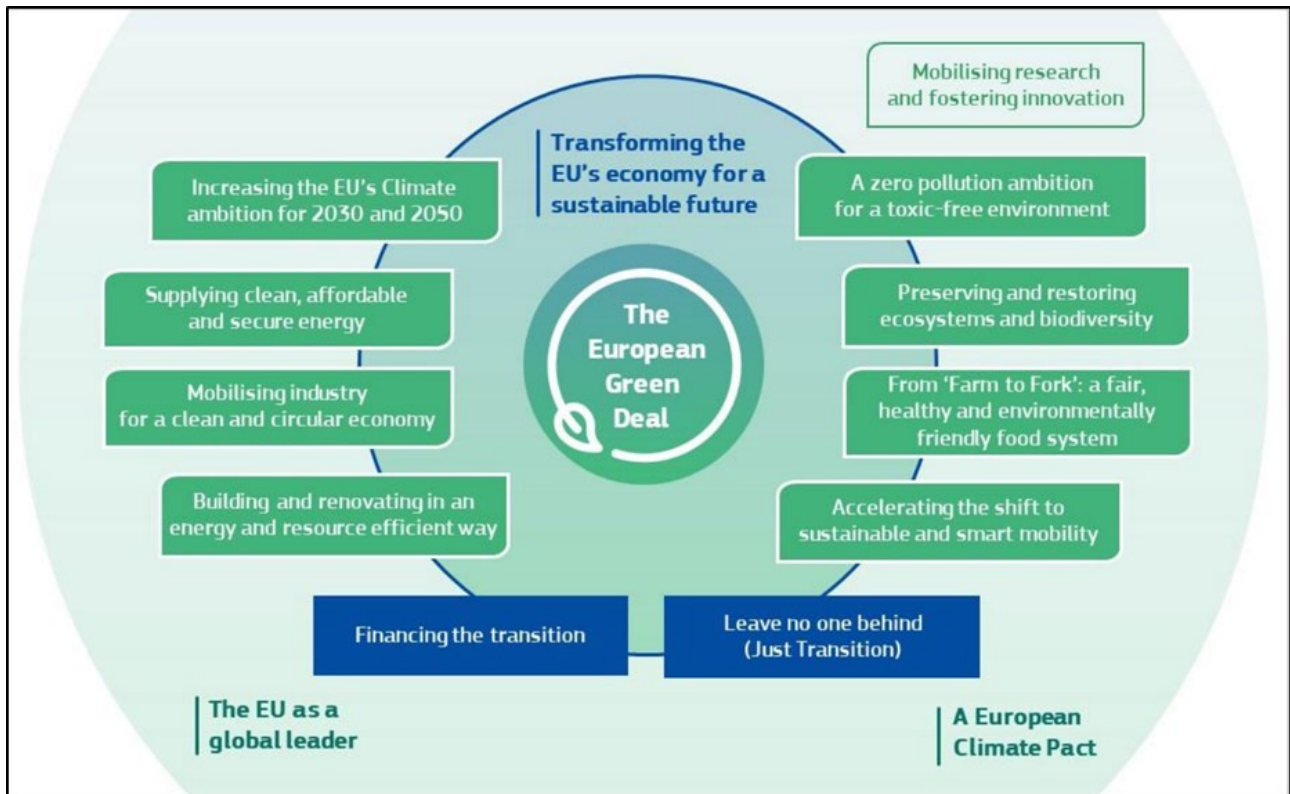


Figure 3: Elements of the European Green Deal

Source: EUR-Lex (n.d., p. 3)

The Farm to Fork (F2F) Strategy. The F2F strategy acknowledges interconnections between the health of people, societies, and the environment. An overarching goal is to facilitate a shift to healthier, sustainable diets and bring nature back into the lives of people. It is the first attempt in the history of the EU food law of the Union to address 'food sustainability' in a comprehensive way, from production to consumption (see Box 3).

As stated in the European Green Deal, the F2F strategy is intended to contribute, among other things, to **achieving a circular economy** (EUR-Lex, 2019). It aims to reduce the environmental impact of the food processing and retail sectors by acting on transport, storage, packaging, and food waste. This includes actions to combat food fraud, including strengthening enforcement and investigative capacity at EU level, and launching a process to identify new innovative food and feed products such as seafood based on algae.

Other key aspects of this strategy important for sustainable agriculture include:

- Requiring that **national strategic plans for agriculture** to fully reflect the ambition of the European Green Deal and the Farm to Fork Strategy;
- Significantly **reducing use and risk of chemical pesticides, as well as use of fertilisers and antibiotics**;
- Identifying new opportunities for operators and stakeholders at all stages of the food value chain to use **new technologies and scientific discoveries**, combined with increasing public awareness and demand for sustainable food, paving the way to a more sustainable food policy;
- Recognising the **CAP as the key tool** to advance the F2F strategy to tackle climate change, protect the environment and

preserve biodiversity, while ensuring farmers a decent living, and stipulating for 2021 to 2027, that at least 40% of the CAP's overall budget contributes to climate action;

Stimulating sustainable food consumption and promoting affordable healthy food for all, the EU is not to allow imports of food that does not

comply with relevant environmental standards. Additionally, actions will be proposed to help consumers choose healthy and sustainable diets and reduce food waste by providing better information about food origins, nutritional value, and environmental footprint. Finally, all aspects of the food chain will be subject to regulation.

Box 2

Institutional and legislative frameworks supporting the Farm to Fork Strategy

The Farm to Fork (F2F) Strategy is supported by a robust legislative framework and advisory bodies that play key roles in its implementation and sustainability, and an evolving legislative framework. As priorities shift under the new European Commission (2024–2029), the strategy's orientation and implementation are expected to be adapted to reflect the evolving political and economic context.

Institutional support mechanisms

The **Advisory Group on Sustainability of Food Systems (AGSFS)**, created in 2022 to replace the Advisory Group on the Food Chain and Animal and Plant Health, serves as the main consultation platform for all stakeholders on matters related to the F2F Strategy and the sustainability of food systems. As the primary advisory body, the AGSFS provides the European Commission with expert advice on a range of topics, including food safety, public health, animal welfare, and new technologies. The AGSFS meets twice a year and holds additional ad hoc meetings to address specific technical challenges, involving specialists as needed.¹¹⁴

Complementing this advisory function, Food 2030 is the EU's research and innovation policy framework supporting the transition to sustainable, healthy, and inclusive food systems that respect planetary boundaries. This initiative aligns with the European Green Deal, the F2F, and the Bioeconomy Strategy. Food 2030 adopts a multi-actor approach to research and innovation, addressing interconnected issues, such as climate change, resource scarcity, and biodiversity loss. It focuses on four key areas: promoting sustainable diets; enhancing environmental performance of food systems; advancing circularity and resource efficiency; and fostering innovation and community empowerment (Bizzo et al., 2023).

¹¹⁴ For further information about the AGSFS, see: https://food.ec.europa.eu/horizontal-topics/expert-groups/advisory-groups-action-platforms/advisory-group-agsfs_en

Launched in January 2024 as part of the Common Agricultural Policy, the Strategic Dialogue on the Future of EU Agriculture, launched in January 2024 as part of the Common Agricultural Policy, aims to develop a cohesive vision for European agriculture. This forum brings together key stakeholders from across the agri-food sector, including farmers, cooperatives, agri-food businesses, and rural communities, as well as non-governmental organisations, civil society representatives, financial institutions, and academia. It addresses emerging challenges and opportunities, fostering a collaborative approach to ensure a sustainable and competitive future for Europe's food system.¹¹⁵

By leveraging expert advice, research, and stakeholder engagement, these initiatives aim to create a resilient and sustainable food environment. The ongoing collaboration and innovation driven by these efforts are crucial for achieving the long-term goals of the F2F to Fork Strategy.

Legislative framework and implementation gaps

The F2F Strategy originally envisioned a comprehensive Framework for Sustainable Food Systems (FSFS) as its regulatory cornerstone. Conceived as horizontal legislation comparable to the General Food Law, the FSFS aimed to integrate sustainability across all food policies, establish common principles and requirements, and provide legal certainty. However, this flagship initiative, initially projected as a landmark proposal for 2023, was never presented. Thus, the strategy operates primarily as a framework for political direction; its intended measures will only have real impact once incorporated into specific laws at both EU and Member State levels.

Source: EC (n.d.a)

EU Biodiversity Strategy for 2030

The EU Biodiversity Strategy,¹¹⁶ adopted in 2020, is a comprehensive policy framework that sets the European Union's ambitious, non-binding commitments to address the main drivers of biodiversity loss, including changes in land and sea use, overexploitation, climate change, pollution, and invasive alien species.

The **main objectives** of the strategy are:

- **Protect nature and increase the coverage and effectiveness of protected areas,** building notably on the Natura 2000 network.¹¹⁷

- **Restore damaged ecosystems,** including carbon-rich ecosystems, to good ecological status and enhance the flow of essential services that they provide;
- Promote the **sustainable use of forest, agriculture, marine, freshwater, and urban ecosystems;** and
- **Fully integrate biodiversity considerations** into other EU policies and addressing EU impacts on global biodiversity.

The strategy envisions a **widened Nature Protection Network** of protected areas to transform at least 30% of Europe's lands and seas into effectively managed protected areas (one of

¹¹⁵ For more information, see: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/main-initiatives-strategic-dialogue-future-eu-agriculture_en

¹¹⁶ For more information about the EU Biodiversity Strategy for 2030, see: https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF

¹¹⁷ Stretching over 18% of the EU's land area and more than 8% of its marine territory, Natura 2000 is the largest coordinated network of protected areas in the world. It offers a haven to Europe's most valuable and threatened species and habitats. For further information, see: https://ec.europa.eu/environment/nature/natura2000/index_en.htm

the targets of the CBD 2020 Global Biodiversity Framework), with 10% of them strictly protected. This Trans-European Nature Network builds upon existing Natura 2000 areas. A related element is the call for a far-reaching EU Nature Restoration plan.¹¹⁸

Sustainable land use practices like organic farming have been proposed by the Biodiversity Strategy to safeguard biodiversity through ecosystem resilience enhancement. Advocating for greater adoption of organic farming techniques, this strategy intends to mitigate negative impacts on habitats and wildlife caused by intensive agricultural activities while promoting soil health improvement.

While the Strategy provided the essential political vision and roadmap, its broad, aspirational nature meant it relied on subsequent legislative actions for its concrete implementation and enforcement.

The EU Nature Restoration Law

Adopted in 2024, the EU Nature Restoration Regulation (NRR)¹¹⁹ stands as a landmark regulatory instrument that translates the vision of the EU Biodiversity Strategy into legally binding obligations. As an EU regulation, it ensures uniform implementation, enforceability, and legal certainty across all Member States, significantly reducing national discretion while requiring the submission, monitoring, and revision of National Restoration Plans according to strict timelines.

The regulation sets out a broad restoration goal aimed at the long-term recovery of nature across EU land and sea, while also establishing binding targets for particular habitats and species. These measures should cover at least 20% of the EU's terrestrial and marine areas by 2030, extending to all degraded ecosystems by 2050.

Key innovative features of the NRR include:

- **Ecosystem-based approach:** The regulation mandates tailored restoration measures for specific ecosystem types, including urban, forest, marine, agricultural, and freshwater environments, moving beyond static habitat lists to enable adaptive, landscape-level responses. Agricultural ecosystems are expressly covered, with dedicated indicators, such as pollinator populations, soil carbon, and landscape features, ensuring alignment with CAP Strategic Plans and existing agri-climate tools.
- **Territorial flexibility:** Through National Restoration Plans, Member States retain discretion to prioritise degraded areas and ecosystem-specific measures while remaining bound by Union-wide targets.
- **Explicit linkage between restoration, biodiversity, and climate goals:** The law explicitly links restoration to climate objectives, legally anchoring it to the EU Climate Law, LULUCF Regulation, and climate neutrality targets. Peatland rewetting and ecosystem carbon functions are accorded central importance.
- **Synergy with the CAP:** The NRR is aligned with the Common Agricultural Policy. Article 14(10), which requires Member States to identify and promote synergies between restoration measures and CAP Strategic Plans, while Article 14(11) clarifies that implementation does not require reprogramming of approved 2021–2027 CAP plans. Article 15(5) further mandates that National Restoration Plans detail their interaction with CAP instruments.
- **Indicators and progressive obligations:** The regulation introduces measurable indicators – such as pollinator abundance and soil health – tied to timelines and trend-based

¹¹⁸ For more information about the plan, see: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/652207/IPOL_BRI\(2020\)652207_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/652207/IPOL_BRI(2020)652207_EN.pdf)

¹¹⁹ For more information about the NRR, see: https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-regulation_en

improvement obligations, with provisions for future integration of thresholds via delegated acts.

and urban green infrastructure expansion, coupled with measures to ensure the long-term durability of restoration outcomes.

- **Robust monitoring framework:** A digitalised, harmonised monitoring system coordinated by the European Environment Agency aims to ensure transparency and accountability, supporting adaptive management through periodic assessments.
- **Recognition of ecological connectivity as a structural value:** The NRR enshrines legal duties to enhance ecological networks, including river continuity restoration (e.g., dam removal), marine habitat connectivity,

The NRR turns the Strategy's restoration goals into a legal obligation, providing a predictable legal foundation necessary to address and, potentially, reverse and halt biodiversity loss across the European Union.

Other relevant key instruments

Table 2 outlines **other EU legal instruments and frameworks that relate in some manner to the EU Common Agricultural Policy** and the reform targets in CAP 2023–2027.

Table 2 Examples of other EU instruments relevant to CAP

Name	Status	Goal/Objectives	Targets/comments
Soil Monitoring and Resilience Directive	Approved by the Parliament in June 2025. Second reading at the European Parliament is expected in October 2025 ¹²⁰	The Soil Monitoring and Resilience Directive aims to establish mandatory soil health monitoring, set out guiding principles for sustainable soil management, and tackle cases where soil contamination creates unacceptable risks to human health and the environment.	Originally envisioned as a 'Soil Health Law', the Directive proposes a more limited framework. It establishes measures for monitoring and assessing soil health, promoting sustainable soil management, and addressing contaminated sites.
EU Deforestation Regulation	Entered into force in June 2023 ¹²¹	The EU Deforestation Regulation establishes rules for listed agricultural products in terms of placing and making them available on the EU market. Overall objective includes reducing the Union's contribution to GHG emissions.	This regulation forbids the entry into the European market of products listed in Annex 1 that contribute to deforestation and forest degradation in the EU or globally. By doing so, it notably addresses deforestation driven by agricultural expansion and promotes deforestation-free products.

¹²⁰ Further information is available at: <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-healthy-soils>

¹²¹ Further information is available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02023R1115-20251226>

Zero Pollution Action Plan	Adopted by the European Commission in 2021	The goal of the Zero Pollution Action Plan is to reduce air, water and soil pollution to levels that are no longer considered harmful to health and natural ecosystems. The aim is to attain levels of pollution low enough that they respect the boundaries with which our planet can cope, thereby creating a toxic-free environment. The Action Plan provides a compass to mainstream pollution prevention in all relevant EU policies, to step up implementation of the relevant EU legislation and to identify possible gaps.¹²²	Key targets to accelerate pollution reduction at the source include: • Improving air quality to cut premature deaths from air pollution by 55%; • Enhancing water quality by reducing plastic litter in the sea by 50% and microplastics by 30%; and • Improving soil quality by halving the use of chemical pesticides. The plan also aims to reduce by 25% the extent of EU ecosystems where air pollution threatens biodiversity, decrease the share of people chronically disturbed by transport noise by 30%, and cut residual municipal waste by 50%.
EU Adaptation Strategy	Adopted by the European Commission in 2021	The Strategy has four principal objectives, to make adaptation: • smarter; • swifter; • more systemic; and • to step up international action on adaptation to climate change.¹²³	The EU Adaptation Strategy includes measures to advance knowledge and data collection on climate risks, focusing on developing and implementing solutions to reduce climate risks, protect the climate, and ensure the availability of fresh water. It supports adaptation strategies at all levels of governance with priorities on macro-fiscal integration, nature-based solutions, and local action. Additionally, it envisions increased EU support for international climate resilience by providing resources, prioritising actions, scaling up finance, and strengthening global engagement.¹²⁴

¹²² For further information, please see: https://environment.ec.europa.eu/strategy/zero-pollution-action-plan_en

¹²³ For further information, see : <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082> (p. 5)

¹²⁴ For further information, see : <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082> (p. 22)

EU Soil Strategy for 2030	Published by the European Commission in 2021	The EU Soil Strategy for 2030 is dedicated to soil protection. It proposes to adopt sustainable soil management practices and build knowledge for application. It also sets up a framework and several objectives for protection, restoration, and sustainable management of soils for agriculture and forestry, with the goal of a new EU law protecting European soils.¹²⁵	The vision of achieving good soil health by 2050 notably aims at the following objectives: • All EU soil ecosystems are healthy and more resilient; • Soil pollution is reduced to levels not harmful to people's health or ecosystems; • Soils are protected, managed sustainably, and degraded soils are restored.
EU Forest Strategy for 2030	Adopted by the European Commission in 2021	The EU Forest Strategy for 2030 is a component of the European Green Deal and builds on the EU Biodiversity Strategy for 2030. The EU Forest Strategy contributes to achieving the EU's biodiversity objectives as well as its greenhouse gas emission reduction target.¹²⁶	The EU Forest Strategy for 2030 is linked to the CAP, which provides financial support for forestry through rural development interventions, to help forests and forest-based industries mitigate against climate change by adopting agroforestry practices within the Eco-scheme regime.
Conservation & restoration of habitats	Bird & Habitats Directives, adopted in 1979 and 1992, respectively	The Birds Directive requires all Member States to protect all wild bird species, as well as protect and restore their habitats. For threatened bird species, Member States are required to designate Special Protection Areas (SPAs). The Habitats Directive extends protection to over a thousand species, including mammals, reptiles, amphibians, fish invertebrates, and plants, and 230 characteristic habitat types. Beyond preventing further decline or loss of these species and habitats, both Directives seek to enable their long-term recovery and flourishing.¹²⁷	Targets have fallen short. According to a 2019 European Environmental Agency assessment, 81% of protected habitats and 63% of protected species are in poor or bad conservation status.

¹²⁵ For further information, please see: https://environment.ec.europa.eu/topics/soil-health/soil-strategy-2030_en

¹²⁶ For further information, please see: https://environment.ec.europa.eu/strategy/forest-strategy_en

¹²⁷ For more information on Birds and Habitats Directives, see: https://commission.europa.eu/publications/fitness-check-eu-nature-legislation-birds-and-habitats-directives-directive-2009/47ec-conservation_en

4.2. Regional trade agreements

Regional trade agreements (RTAs) are a **growing trend in international trade**. RTAs began to increase in number and complexity after World War II as countries sought to increase market access to spur their economic development. RTAs became a mechanism to do this, allowing groups of countries to negotiate preferential trade terms among themselves. They provided an alternative to the multilateral trade negotiations under WTO which were not responding to agricultural trade liberalisations, as discussed in chapter 3.

The next section **gives an overview of RTAs, their growing use by WTO member governments, and WTO rules and conditions of use**. Selected examples of current RTAs are then provided, including the extent to which sustainable agriculture elements are incorporated. Such experiences may provide insights that help inform other countries negotiating new RTAs agreements that support sustainable agriculture.

4.2.1. WTO rules for regional trade agreements

WTO defines RTAs as any **reciprocal trade agreement between two or more partners**, not necessarily belonging to the same region. All member governments are currently parties to an RTA, with three¹²⁸ Agreements in force as of January 2024. Even with the proliferation of

these agreements, WTO members consistently reaffirm the pre-eminence of the WTO as the¹²⁹ RTAs are an **important deviation from the WTO's most-favoured nation rule**, the principle of not discriminating between trading partners. They are allowed so long as they promote the legitimate role of RTAs of facilitating trade between its parties while not raising trading barriers vis-à-vis third parties. RTAs must remain complementary to, not a substitute for, the multilateral trading system.¹³⁰

To facilitate monitoring of RTAs, the **WTO maintains a RTA database on all current RTAs**, with the agreement's name, countries involved, trade items covered, and date of entry into force.¹³¹ WTO members have focused mainly on the need for transparency. In December 2006, the WTO General Council adopted a decision creating a Transparency Mechanism for Regional Trade Agreements to improve the transparency of RTAs, which has been applied provisionally but is expected to be adopted as a permanent mechanism.¹³² RTAs are overseen by the WTO Committee on Regional Trade Agreements established in 1996. This Committee is also mandated to hold discussions on the systemic implications of RTAs for the multilateral trading system.

Table 3 is a summarised compilation **of selected current RTAs** covering agricultural products.

128 For an overview of RTAs, see: https://www.wto.org/english/tratop_e/region_e/scope_rta_e.htm

129 For more information on the Nairobi Ministerial Declaration, see: https://www.wto.org/english/thewto_e/minist_e/mc10_e/mindecision_e.htm

130 For more information, see: https://www.wto.org/english/tratop_e/region_e/region_e.htm#rules_ita

131 For more information, see: <https://rtais.wto.org/UI/charts.aspx>

132 For information on the procedures for implementation of the decision, see: https://www.wto.org/english/tratop_e/region_e/region_e.htm#transparency.

Table 3 Selected regional trade agreements related to agriculture

Title/date of entry into force	Members	Purpose/agriculture	Sustainability provisions/comments
Comprehensive Economic & Trade Agreement (CETA) ¹³³ Provisionally applied since 2017; full ratification pending	Canada and EU (some EU states still to approve) ¹³⁴	Eliminates 99% of all tariffs on trade in goods and services. Canada eliminates almost 92% of agricultural tariffs. Quotas on certain agricultural products.	Recognises sustainable development (Chapter 22) and environmental concerns (Chapter 24). No legal obligation; only voluntary compliance. No requirement that environmental standards be harmonised so Party with lower standards could have a competitive advantage. Calls for regulatory cooperation. Precautionary principle noted but not mandatory. While its final ratification remains pending, its provisions on trade and investment liberalisation (with the exception of investment protection and the Investment Court System) are already applicable under the provisional application regime.
European Union and Viet Nam Trade Agreement (EVFTA), ¹³⁵ (2020)	EU and Socialist Republic of Viet Nam	Aims to eliminate 99% of all tariffs on trade in goods and services, with significant and growing trade in agricultural products.	Key purpose is to promote greater investment in Viet Nam agriculture and increase market access to Viet Nam agricultural products. Chapter on environmental protection and sustainable development. Article 3.6(1) calls for cooperation on climate change (all UNFCCC agreements,) and enhancing capacity to reduce GHG emissions. Article 13.7 encourages information sharing and promotion of biodiversity conservation – no requirement. Text mentions cooperation and capacity building in environment, trade aspects of agriculture including animal welfare. No technical assistance mechanisms.
United States-Mexico-Canada Agreement (USMCA), 2020 ¹³⁶	United States, Mexico, Canada	Duty-free access for most agricultural products. It strengthens SPS measures and fosters cooperation in agricultural biotechnology.	It includes provisions on trade and biodiversity, requiring the protection of endangered species and the implementation of CITES, and addresses the prevention of invasive alien species to reduce impacts on agricultural ecosystems. In fisheries, promotes sustainable fisheries management by prohibiting subsidies that contribute to overfishing, and combats illegal, unreported and unregulated (IUU) fishing through cooperation in monitoring and control.

¹³³ For information on the text of CETA, see: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22017A0114\(01\)&from=PT](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22017A0114(01)&from=PT)

¹³⁴ This is a sometimes called a 'mixed agreement', and must still be ratified by the national parliaments of all EU Member States and some regional ones.

¹³⁵ For more information on the text of EVFTA see: https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/vietnam/eu-vietnam-agreement/texts-agreements_en

¹³⁶ Final text available at: <https://ustr.gov/trade-agreements/free-trade-agreements/united-states-mexico-canada-agreement/agreement-between>

ASEAN Free Trade Area (AFTA), 1992 ¹³⁷	Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand, Viet Nam ¹³⁸	Covers all agricultural products. However, 734 tariff lines excluded for national security, protection of human, animal or plant life and health, etc.	The Association of Southeast Asian Nations (ASEAN) Free Trade Area (AFTA) includes commitments to promote sustainable agriculture and rural development among its member countries. While specific provisions related to sustainable agriculture may vary among ASEAN member states, the AFTA framework provides a platform for cooperation and exchange of best practices in sustainable agriculture and environmental management.
Association of Southeast Asian Nations (ASEAN) Comprehensive Investment Agreement (ACIA) 2012 ¹³⁹	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam ¹⁴⁰	Provisions for investments in agricultural and agribusiness; agriculture sector is a major source of livelihoods in the region.	Emphasis on investment and free market flows; expansion of agro-industrial, monoculture plantations transforming landscapes, replacing rural families and communities; little or no safeguards to promote sustainable agriculture and associated economic and social sustainability. Does not explicitly incorporate sustainable agricultural provisions.
African Continental Free Trade Area (AfCFTA), 2019; started trading under preferential arrangement in 2021 ¹⁴¹	47 African countries ratified; 54 signatories (19/09/2023) largest FTA after WTO agreement	Classic provisions to phase out tariffs selectively, cooperate on investment and all trade-related matters, long-term goal: single market for goods and services.	Aims to integrate intra-African markets and reduce dependence on foreign agricultural imports; common market can strengthen trade/competitiveness; drive new investment from abroad, from within the continent and outside; contains general statements about sustainable development, nothing explicit on sustainable agriculture.
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) 2019 ¹⁴²	Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, Peru, New Zealand, Singapore, Viet Nam	Covers all sectors and aspects of trade to eliminate or reduce barriers; establishes clear rules that help create a consistent, transparent and fair environment to do business in CPTPP markets.	Provisions on environmental protection and, sustainable development. While not specifically focused on agriculture, the agreement includes chapters with commitments to promote sustainable management of natural resources and biodiversity conservation, relevant to agriculture and food production.
Central American-Dominican Republic Free Trade Agreement (CAFTA-DR), 2004 ¹⁴³	Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and USA	Promotes stronger trade and investment ties, prosperity, and stability throughout the region.	First free trade agreement between the USA and a group of smaller developing economies of Central America; includes commitments to enforce environmental laws and regulations (Chapter 17).

137 For more general information on AFTA, see: <https://asean.org/wp-content/uploads/images/archive/pdf/AFTA.pdf>

138 For more information about AFTA membership, see: <https://asean.org/afta-units/>

139 For more information about ACIA, see: <https://asean.org/wp-content/uploads/2020/12/ASEAN-Investment-Comprehensive-Agreement.pdf>

140 For more information about ASEAN Member States, see: <https://asean.org/about-asean>

141 For the text of AfCFTA, see: https://au.int/sites/default/files/treaties/36437-treaty-consolidated_text_on_cfta_-_en.pdf

142 For more information, see consolidated agreement at: <https://www.iilj.org/wp-content/uploads/2019/05/CPTPP-consolidated.pdf> and a summary [here](#).

143 For the final text, see: <https://ustr.gov/trade-agreements/free-trade-agreements/cafta-dr-dominican-republic-central-america-fta/final-text>

Recent shifts in U.S. trade policy, particularly the imposition of rapidly changing tariffs and countermeasures on key agricultural

commodities, are reconfiguring global agri-food markets in unpredictable ways. See Box 4 for a brief analysis on these recent changes.

Box 4

Agricultural trade, tariffs market volatility

The volatility related to the recent shifts in U.S. trade policy has generated significant uncertainty for producers and policymakers alike, affecting the competitiveness of soy, maize, dairy, and meat exports, and complicating investment in long-term sustainability transitions. For consumers, the most visible effect will be price inflation across a wide range of products, from staple produce to specialty imports like wine and cheese. Shoppers may turn increasingly to cheaper alternatives, boosting demand for private labels and domestic suppliers, but questions remain as to whether U.S. producers can meet both demand and quality standards. Beyond immediate price and supply chain disruptions, such trade tensions may also have a chilling effect on regulatory ambition. For this, governments may hesitate to introduce more stringent environmental and climate-related standards – such as pesticide restrictions, animal welfare rules or carbon pricing mechanisms – for fear of eroding the competitiveness of their domestic producers in already unstable export markets.¹⁴⁴

These dynamic risks entrenching a defensive, short-term approach to agricultural trade policy, privileging market access and price stability over long-term ecological resilience. It also exacerbates the structural misalignment between international trade law and climate/biodiversity objectives: while the multilateral framework of the WTO provides some space for environmental measures under Articles XX(b) and (g) of the GATT,¹⁴⁵ the threat of retaliatory tariffs and escalating trade disputes create additional political and legal disincentives to act. In the absence of clear coordination mechanisms, the result may be a fragmented global landscape where sustainability standards advance unevenly, reinforcing competitive distortions rather than facilitating convergence toward higher ecological baselines (Cervantes-Godoy, D. (2022); WTO & UNEP, 2018).

At the same time, the volatility underscores the strategic importance of plurilateral initiatives such as 'climate clubs' or bilateral agreements, that embed sustainability provisions more robustly (Leal-Arcas, 2020; Weischer et al., 2012). These frameworks could provide a buffer against unilateral trade shocks, while creating incentives for convergence on environmental standards across jurisdictions. However, their effectiveness will depend on whether they are designed in a manner that is consistent with international trade law, avoids discriminatory practices, and genuinely contributes to nature-positive agricultural transformation rather than serving as disguised protectionism.

Key messages of Chapter 4

- 1. The European Union exemplifies a critical evolution in its sustainable agriculture policies, which are relevant in much of the world due to their obligations and implications in global trade relations.** As the world's largest importer and exporter, its policies are vital not only for its members but also for establishing major sustainability

standards for its trading partners worldwide, both through its numerous trade agreements and with other trade requirements, for example those related to the Regulation on Deforestation-Free Products.

- 2. The main agricultural policy of the European Union, the Common**

¹⁴⁴ FAO and UNCTAD stressed the consequences of post-Covid supply chain shocks, the war in Ukraine, and US-China trade tensions. See FAO (2020 & 2024) and UN (2023, chapter 2, pp. 37–45, section on supply chain shocks).

¹⁴⁵ GATT Article XX on General Exceptions lays out a number of specific instances in which WTO members may be exempted from GATT rules. Two exceptions are of particular relevance to the protection of the environment: paragraphs (b) and (g) of Article XX. Pursuant to these two paragraphs, WTO members may adopt policy measures that are inconsistent with GATT disciplines, but necessary to protect human, animal or plant life or health (paragraph (b)), or relating to the conservation of exhaustible natural resources (paragraph (g)).

Agricultural Policy (CAP), has undergone significant evolution over the last 60 years. Initially focused on fostering productivity to guarantee food supplies and ensuring adequate incomes, it now places more emphasis on promoting sustainable agriculture. The current CAP is better equipped to address the challenges of climate change, environmental sustainability, and the need to preserve landscapes and biodiversity. It establishes greater income support for agricultural sustainability and sets clear mandatory 'eco-scheme' targets for its Member States.

3. The **CAP intersects with other instruments that are fundamental for sustainable agriculture, particularly with the European Green Deal and two programmes within that framework:** Farm to Fork (food systems) and the EU Biodiversity Strategy 2030. The alignment of these programmes requires that the national strategic plans for agriculture fully reflect the ambition of the European Green Deal and the Farm to Fork Strategy, significantly reducing the use and risk of chemical pesticides, as well as the use of fertilisers and antibiotics.
4. **Regional trade agreements (RTAs) related to agriculture vary widely in their scope and effectiveness,** with some containing strong commitments to sustainability and environmental protection, and others

having more limited or no significant environmental provisions. In many cases, the relationship with sustainable agriculture is more voluntary, through mechanisms of cooperation on climate change or the exchange of best practices. Implementation and enforcement are challenging and vary depending on the political will and capacity of the countries involved. In other cases, capacity building is promoted to reduce emissions, support adaptation, and conserve biodiversity.

5. **Given the great potential that RTAs have for generating commitments from countries in terms of sustainable agriculture,** they should be prioritised in global, regional, and national agendas. Conventions on biodiversity, climate change, and desertification should make recommendations for RTAs. International institutions, scientific bodies, and development banks should develop guidelines on how to include sustainable agriculture in trade agreements. Ministries of the Environment should have a more active participation in trade negotiations.
6. Recent trade volatility is reshaping global food markets, driving up prices and discouraging stronger environmental standards, while exposing the need for coordinated agreements that link trade and sustainability.



Woman farmer harvesting tea leaves, in Taraba, Nigeria © AHMED ABUBAKAR BATUPE

5. National laws and policy regimes for sustainable agriculture

Achieving sustainable agriculture, as repeatedly noted in earlier sections, requires a variety of **supportive national and subnational laws and policies that promote environmentally friendly, socially equitable, and economically viable farming practices**. This chapter highlights the main areas in national law and policy providing such support. The role of these national laws and policy regimes includes incorporating the country's obligations under international law and complying with standards and guidelines in international policy adopted by the country (as highlighted in [chapter 1](#)). It also includes complying with standards, protocols, and guidelines of other international institutions addressing activities crucial for sustainable agriculture, such as trade, food safety, and international cooperation (as surveyed in [chapters 2 and 3](#)).

Ultimately, national application of laws, codes, standards, regulations, and associated institutional mechanisms comprise the enabling framework for achieving sustainable agriculture.

These **frameworks should recognise that current support for agriculture, predominantly focused on conventional and intensive approaches, is often unsustainable** and does not equally benefit all sectors and actors, exacerbating inequalities. Governments have the responsibility and options to alter this trend. For example, providing incentives to farmers for adopting sustainable agricultural practices, and phasing out subsidies for commodities that promote unsustainable practices are actions that could shift the current approach toward

one that supports sustainable agriculture (FAO et al., 2021).

This chapter is organised into two sections:

i) new and emerging areas of national law and policy requiring attention to address global change impacts on agricultural sustainability; and ii) classic, long-standing areas of traditional agricultural legal frameworks that also need fresh review and, as needed, updating and harmonisation with new and emerging sectors. As countries work to achieve sustainable agriculture, it is important to review, update, and, as needed, harmonise these topics to ensure they are incorporating the latest environmental, social and economic knowledge important for shifting to and maintaining sustainable agriculture.

The **first section advances two overarching themes of global change – climate change and biodiversity loss**. These two issues are recognised as the most significant global crises, impacting societies, economics, and environmental sustainability with increasing severity, and threatening transitions to long-term sustainable agricultural productivity and global food security. These themes have been relatively newly recognised as needing direct and significant integration into national agricultural law and policy frameworks. Modern international law and policy instruments have been defining clear obligations and providing detailed guidance for addressing these issues, and national experience is growing on the kinds of basic enabling tools to consider. This is followed by three specific areas of law and policy that are changing in response to climate change

and biodiversity loss: environmental regulation, land use planning that incorporates nature-based solutions, and disaster risk reduction.

The **second section highlights two long-standing agricultural sectors – water management and soil conservation** – both facing new challenges responding to climate change impacts and biodiversity loss. The section concludes with a brief overview of three areas of law more broadly generic across society but important for long-

term sustainable agriculture, and increasingly dealing with considerations of climate change and biodiversity: worker safety and health, food waste, and food safety.

Additionally, as a preamble of the legal and policy frameworks to be presented, **a summary of case studies is introduced to evaluate the efforts to incorporate sustainable agriculture laws and policies into the legal systems of different countries** (Table 4).

Table 4: Main conclusions from each case study

Country	Main conclusions
Brazil	As one of the world's largest food producers, Brazil plays a crucial role in global food security. However, its food systems still face enormous sustainability challenges. Through innovation and technological advances, Brazil has overcome the major challenges of national food security. Its agricultural systems now need to focus on environmental issues as well as the economic and social dimensions of sustainability.
Germany	Germany has made significant progress in adopting sustainable agricultural practices, supported by the EU's Common Agricultural Policy (CAP), the EU Eco-Regulation, and its National Sustainable Development Strategy. However, environmental agricultural policy often results from political compromises rather than evidence-based research, limiting its effectiveness.
Kyrgyzstan	Agriculture is the backbone of Kyrgyzstan's rural economy. However, the sector has not been adequately modernised, making it insufficient to reduce high rates of poverty and food insecurity. A variety of programmes funded by foreign aid seek to promote food security and sustainable agricultural practices. However, national programmes and strategies still prioritise increasing productivity and production volumes, without paying sufficient attention to environmental issues and climate change aspects.
Uganda	Agriculture is the predominant land use and main economic activity in Uganda. While subsistence farming remains predominant, the government's vision is to transform it into commercial agriculture. Standards are needed to regulate land use, soil governance, livestock management, crop production and management, water regulation, pesticide control, fertiliser management, and investment and taxation in the agricultural sector. Although a sound policy and legal framework has been developed that provides opportunities to regulate major legal issues, challenges remain in implementing policies and laws due to a lack of knowledge and awareness, as well as gaps in policies and laws, especially regarding incentives for small farmers and protection of their health and safety.
Viet Nam	Viet Nam is a global agricultural powerhouse and a major exporter of key agricultural products. However, current agricultural practices are unsustainable, particularly in a country highly vulnerable to climate change. Viet Nam needs to restructure its agricultural sector by optimising the use of limited land, improving nutrient efficiency, and reducing environmental impacts. Nonetheless, political priorities are not focused on sustainable transitions, which are mainly driven by foreign actors with funding and technical support. This has led to an overlapping legal framework with ad hoc policies and a constant lack of coordination between jurisdictions in implementing sustainable agricultural policies.

The case studies in the annex include Brazil, Germany, Kyrgyzstan, Uganda, and Viet Nam. Each case study examines the specific context of each country, including its relevant policies and legal frameworks, and provides insights into how these countries are addressing sustainability in agriculture. Even so, the case studies do not represent a universal 'state of the art', as each country must build its legal frameworks according to its specific needs, capacities, national goals, and legal system. However, they offer early insights into the integration of sustainable agriculture law in national legal and policy frameworks.

Legislative approaches that combine agricultural objectives with **climate action and environmental protection** vary significantly among the countries studied. Germany leads with substantial progress, supported by the New Common Agricultural Policy (2023–2027) and the European Green Deal, aiming for net-zero GHG by 2050, which implies shifting towards sustainable agricultural and food systems. Brazil follows with its Low Carbon Agriculture Plan, promoting technologies and practices that reduce emissions and enhance climate resilience. Uganda benefits from international cooperation programmes that improve agricultural productivity and tackle climate change, aligning with UNFCCC commitments. In contrast, efforts in Kyrgyzstan and Viet Nam are primarily driven by external agents, with national priorities focusing on productivity and production volume.

Sustainable land management and planning vary significantly among countries. Germany, a major agricultural land user, has made significant strides with its Strategy for the Future of Organic Farming. Additionally, the European Soil Monitoring Law, formally adopted by the Parliament in June 2025, with a final vote expected in October 2025, will establish a comprehensive framework for all EU member states to monitor and assess soil health. Brazil supports sustainable land management through policies, such as the Brazilian Forest Code, the Low Carbon Agriculture Plan, and

the Sustainable Agriculture Finance Facility. In Kyrgyzstan, issues of soil degradation and overgrazing have led to laws focused on soil fertility and protection, including the Law on Soil Fertility for the Protection of Agricultural Lands and the 2019 Law on Organic Agricultural Production. Uganda's National Land Policy of 2013 seeks to manage land resources for socio-economic development but requires further development of national agriculture and soils policies for effective implementation. In Viet Nam, despite efforts for sustainable land management, a lack of coordination between environmental and agricultural agencies results in an overlapping legal framework that hinders effective policy implementation.

Each country has regulations on **water management** with varying emphases. In Germany, the Federal Water Act regulates agricultural water use. Brazil's 2018 Forest Code and PSA programmes support water conservation, although no federal law regulates PSA yet. Kyrgyzstan's Water Code (2004) is the main instrument, with agriculture highly sensitive to rainfall and irrigation water availability. Adaptation plans could focus on reducing water loss and modernising irrigation systems. Uganda benefits from good access to water resources and regular rainfall but faces intermittent droughts. Key legal instruments, including the Water Act Cap 152 and the National Water Policy 1995, regulate water use and management, with recent policies boosting irrigation to transition agriculture from subsistence to commercial. However, stronger standards are needed for agricultural water use. Viet Nam, rich in water resources, faces pollution from unsustainable farming practices involving intensive chemical use, managed by Law No. 17/2012/QH13 on Water Resources, which regulates the management, protection, and use of water resources.

Disaster risk management is not central to policy in the studied countries. While hazards, risks, vulnerabilities, disasters, and resilience are mentioned, there are few dedicated instruments or policies. Each country's NDC

addresses disaster risk management, alongside specific national mechanisms, for example: Viet Nam's resolution on sustainable, climate-resilient Mekong Delta development advocates for resilient agriculture; Uganda's National Policy for Disaster Preparedness and Management focuses on epidemic and disaster management; Kyrgyzstan's agriculture law targets high-risk mountain farming; Germany employs the Hazard Analysis Critical Control Points (HACCP), a risk management system introduced by FAO; and Brazil integrates climate change adaptation in its NDCs and collaborates with Indigenous populations enhancing local risk management.

Food security remains a critical concern for many nations, each adopting unique strategies to ensure their populations are well-nourished. Among the five cases studied, Brazil stands out as the most successful, having effectively tackled

the massive food insecurity it experienced 50 years ago. These efforts established Brazil as a regional leader and led to the Brazil-FAO International Cooperation Programme in 2008, aimed at sharing experiences and knowledge with other countries in the region. In Viet Nam, the National Strategy for Sustainable Agriculture and Rural Development for 2021–2030 includes food security objectives. Uganda struggles with persistent food insecurity and nutritional deficiencies, addressing these issues through irrigation measures aimed at increasing agricultural productivity and access to fresh food. Meanwhile, Kyrgyzstan has made progress in preventing childhood malnutrition over the past decade but still faces complex nutritional challenges exacerbated by the COVID-19 pandemic. The country is drafting a new Food Security and Nutrition Programme, but there is a need for evidence to support its development.

5.1. Priority substantive areas for updating

This section **reviews national laws and policy elements** that are important for advancing sustainable agriculture through responsive provisions in climate change adaptation and mitigation, biodiversity conservation, environmental regulation, land use planning, and disaster risk reduction. Interpreting and implementing the action items addressed in the next paragraphs will have to be guided by the national legal system, legal practice, existing national priorities and commitments, and related social and economic considerations.

It is important to set the stage to the ongoing discussion with some context on legislative approaches and basic legislative principles applicable to the national legal frameworks, particularly regarding sustainable agriculture regimes.

First, countries may **employ different legislative approaches** to advance sustainable agriculture, depending on their political, social, economic, and environmental contexts. Some countries

rely on a **broad combination of sector laws and policies** which collectively and interactively provide the national framework for sustainable agriculture. Others opt for a **single umbrella agricultural law** that provides comprehensive regulations and guidelines across all major sectors on which sustainable agriculture depends. A third approach is to adopt a **hybrid framework**, combining elements of both single umbrella agriculture laws and sector-specific laws and policies to promote sustainable agriculture. The topics highlighted in this section could be considered through any of these approaches, individually or integrated through different policy instruments.

Second, on basic legislative principles, **all national law and policy regimes should incorporate good governance principles**. Good governance principles should be in all legislative reforms or modernisation initiatives. While there is no universally accepted definition of good governance, some core principles are commonly recognised. For the purpose of this paper,

a good reference point is FAO's application of key governance principles advocated for any natural resources' legislation. These are: "participation, transparency, accountability, legitimacy, equality and fairness, efficiency and effectiveness and rule of law" (FAO & UNEP, 2020, p. 30).

Furthermore, **substantive law particularly directed to supporting sustainable agriculture should include principles of flexibility and adaptive management** to enable adjustments in response to changing environmental, social, and economic conditions. Regulatory frameworks should include clear standards, dedicated mechanisms, and guidance for monitoring and enforcement, aspects that may also need adjustment from time to time due to changing needs.

Likewise, legal frameworks should **promote and support research and innovation** so that relevant research institutions can develop, disseminate knowledge, and promote technologies that enhance sustainability. **Capacity building, education, extension services, and training** are important to authorise and support the farmers, especially small-scale farmers, and local and Indigenous farming communities. In this dynamic and multi-dimensional area of international law and policy, it is also essential to encourage collaboration across sectors and international cooperation.

Finally, **social equity and justice** issues regarding participation of all relevant stakeholders at all economic levels, non-discrimination by gender or social group, and measures to protect worker rights to fair wages and safe working conditions need to be addressed through appropriate policies.

5.1.1. Climate change mitigation and adaptation

Climate change is the defining crisis of our time, according to the United Nations, and it is happening even more quickly than projected (UN, n.d.c). It is now the major theme

in sustainable development, cutting across multiple sectors of law and policy, including those related to agricultural sustainability. As discussed in [chapter 2](#), the UNFCCC is the main international law instrument guiding policy and legal actions related to climate change adaptation and mitigation.

One of the **most challenging problems related to climate change is adaptation**, especially for developing countries. With fewer resources and technical capacities for climate change adaptation, developing countries could be more vulnerable. This is particularly dangerous because climate change has direct impacts on food production, affecting food availability and nutrition in countries that already have problems addressing these challenges. National Adaptation Plans (NAPs) should include sustainable agriculture objectives and the means for implementation.

Reducing emissions from food production is an urgent area for attention and needs a global long-term commitment of governments and societies. Under the Paris Agreement, countries pledged to develop and implement NDCs to reduce GHG emissions and enhance resilience to climate change. Integrating agriculture-related actions into NDCs is important to align national climate goals with sustainable agriculture objectives.

Emissions reductions in agriculture are particularly critical for advancing UNFCCC goals. It has long been recognised that food production is one of the biggest contributors to climate change. At the global level, food production contributes significantly to biodiversity loss by driving climate change. Recent research by leading scientists from the USA, Germany, France, Iceland, UNIDO, and IEA found that emissions estimates used for years in climate change planning and setting reduction targets, have been too low (Tubiello et al., 2021). The study found that the food system was responsible for as much as 40% of all GHG emissions from human activities. This new finding means that NDC country pledges under the 2015

Paris Agreement (discussed in [chapter 2](#)), which were based on old estimates, were likely skewed and underestimated. Estimates from agriculture may vary depending on the study, but all reflect percentages that continue to rise.

The following **law and policy issues, obligations and commitments are essential** to address if countries are to achieve sustainable agriculture in the context of climate change:

- Countries should **formulate and implement adaptation strategies to address the impacts of climate change on agriculture**, including changes in temperature, precipitation patterns, and the frequency of extreme weather events. This may involve promoting climate-resilient farming systems, enhancing water management systems, implementing agroecological practices that improve soil and water retention, and other sustainable practices as promoted by FAO (discussed in [chapter 3](#)). NAPs are key instruments through which governments can coordinate national climate change adaptation including sustainable agriculture objectives.
- In response to the UNFCCC emphasis on adaptation and the importance of enhancing resilience of agricultural systems to climate change impacts, countries need to develop **policies and incentives to support farmers in this effort**. Support should include measures to help farmers adopt sustainable agricultural practices and innovations that not only increase resilience to droughts, floods, heatwaves, and other climate-related hazards but also emit fewer GHGs and enhance the conservation and regeneration of soil, water, and agro-biodiversity. Legislation also needs to promote capacity building, training, and extension services along with incentives to encourage adoption of renewable energy technologies. Additionally, implementing landscape and ecosystems approaches – going beyond the farm scale, including water retention, social safety nets, meteorological early warning reaction systems - and activities to strengthen the local dimension and empower communities can be instrumental in advancing sustainable agricultural practices (Oberč & Arroyo, 2020).
- Countries need to develop and implement policies and measures to **mitigate GHG emissions** arising from agricultural activities, such as livestock production, deforestation, and fertiliser use. Sustainable agriculture practices, such as conservation tillage, agroforestry, and improved livestock management, can help reduce emissions while enhancing carbon sequestration in soils and vegetation.
- National policies and incentives can also support **low-carbon agricultural practices** – for adaptation and mitigation purposes – since they reduce emissions and restore soil organic content and above-ground biomass. To improve carbon management in agriculture, regulations should enable the development and implementation of land management practices and clear standards for ensuring land health. Such policies need to be framed so that they can be reasonably implemented while still maintaining or enhancing productivity and livelihoods. Additionally, a focus on long-term planning is essential. This includes incorporating long-term monitoring and evaluation to ensure effective soil organic carbon management. Policies (both regulatory and financial) must align with these long-term objectives to track progress and adjust strategies as needed.
- **Carbon rights legislation is a relatively new area of law also worth considering** as part of a sustainable agriculture legal framework. Such laws and regulations give farmers incentives in the form of carbon rights when they adopt certain recommended environmentally-friendly practices that either remove GHGs from the atmosphere (such as enriching soil organic matter for carbon sequestration) or reduce GHG emissions from their farming operations (such as through no-till farming or agroforestry);

once verified, the farmers may receive compensation for their efforts (Hannam, 2021). This area of law opens the way for including agriculture in markets for carbon tradable credits, although this remains quite a controversial topic. There are a number of existing laws and strategies that serve as useful examples and approaches to frame different types of instruments that provide the farmer incentives to land management of soil carbon in agricultural systems for climate mitigation (Hannam, 2021). For example, the Commonwealth of Australia Carbon Credits (Carbon Farming Initiative) allows farmers and land managers to earn carbon credits that can be bought for businesses that want to offset their carbon pollution. Another alternative is sustainable certifications that support the agricultural practices of farmers and landholders to improve their prices and the legitimacy of their products. These legal and financial instruments must be aligned with long-term goals to ensure the effectiveness of climate change mitigation strategies in agriculture.

5.1.2. Biodiversity conservation

Biodiversity conservation is a major global theme that cuts across many sectors and is **critical for sustainable development, including for sustainability of agriculture**. The loss of biodiversity is widely regarded as one of the key challenges for sustainable development and thus conservation of biodiversity needs to be a high priority together with sustainable use (FAO & UNEP, 2020). The ecosystem approach to natural resource management is recognised as an important tool for protecting biodiversity and, as adopted by FAO, should consider all essential components of sustainability (ecological, social, and economic) (FAO & UNEP, 2020). In addition, the contribution of Indigenous peoples and local communities' 'traditional knowledge also is increasingly recognised as an important input to ecosystem management and biodiversity conservation.

Biodiversity conservation legislation aims to **protect biodiversity and ecosystem services**. In support of sustainable agriculture, countries aiming to strengthen biodiversity conservation law and policy should bear in mind several obligations under the CBD and its Post-2020 Global Biodiversity Framework (discussed at length in [chapter 2](#)), which includes the implementation of NBSAPs for building national biodiversity finance plans among other strategies and actions, considering:

- At the national level, take **all measures necessary to conserve biological diversity**, including ecosystems (such as wetlands), species and genetic resources, and to promote sustainable use of biological resources. These obligations are advanced by developing and implementing sustainable management practices in agriculture. They also are consistent with obligations under Ramsar and the Convention on Migratory Species (also discussed in [chapter 2](#));
- Consider **regulations on the preservation of natural habitats, wildlife protection and the promotion of agroecological practices that enhance biodiversity on agricultural lands**. This may involve creating protected areas, establishing wildlife corridors, protecting wetlands, and incentivising farmers to adopt biodiversity-friendly farming techniques and implement measures to sustainably manage and restore ecosystem services critical for long-term agricultural productivity;
- **Integrate biodiversity into** national policies, strategies, and planning processes across sectors, such as agriculture, water and forestry. This integration helps mainstream biodiversity conservation, restoration, and sustainable use objectives into broader development agendas and decision-making processes.

5.1.3. Environmental protection

Most countries have well established legislation on general environmental protection focused on preserving their natural resources, such as water, air, land and species, and associated ecosystem functions, to advance the country's commitment to the UN Sustainable Development Goals (discussed generally in [chapter 2](#)). Such legislative frameworks normally include an Environmental Impact Assessment (EIA) requirement for major development projects whether through public funds or private investment to protect the country's natural resources.

A law and policy framework for environmental protection may be constituted through an umbrella law or a combination of sector laws, or both. These instruments commonly set out the goals and objectives of environmental protection for the country, a key agency(ies) responsible for implementation, and penalties for non-compliance. They authorise regulations in such areas as water and air quality, and pollution control, contamination of land depending on its use, EIA, and, especially in cases where there is no stand-alone law, biodiversity conservation. The regulations may include minimum standards regarding water, air, and land resources to safeguard human health and the natural environment on which livelihoods depend.

Such environmental protection laws play a critical role in **protecting the environment from negative impacts of agriculture**, such as soil erosion, water pollution, and habitat destruction. Some specific areas where strengthening and enforcing environmental protection laws to support sustainable agriculture include:

- **Implementing stricter regulations** on pesticide and fertiliser use, promoting organic farming practices and soil conservation, and enforcing measures to reduce agricultural runoff and contamination;

- **Implementing regulations to minimise** pesticide use, promote integrated pest management (IPM) practices, and establish buffer zones around critical habitats also help mitigate negative impacts from sustainable agricultural practices on biodiversity conservation and migratory species (pursuant to commitments under the Convention on Migratory Species (discussed in [chapter 2](#));
- Strengthening the permitting of processes based on environmental assessments to **evaluate impacts of water use and withdrawal on ecosystems**, such as fish habitats and wetlands; adding permit conditions to protect water quality, maintain streamflow for aquatic habitats, and minimise soil erosion.
- Strengthening **incentive programmes to local farmers** to encourage sustainable agriculture, including to promote agroecological practices, methods, such as crop rotation, organic farming, and integrated pest management, to minimise chemical inputs and promote ecosystem health;
- Authorising and developing processes that promote entering into agreements with a range of entities, including farmers and farming communities, to participate in **Payment for Environmental Services (PES)**, a practice well established in many countries (FAO & UNEP, 2022, pp. 622–631, section 9.7);
- Creating a programme of **sustainability certifications** to help consumers identify whether or not a product or producer is sustainable. Certifications also could be issued for conservation of resources through sustainable agriculture or certificates for organic farming produce sold in local or outside markets.¹⁴⁶

¹⁴⁶ See, for example, use of sustainable agricultural standards and certificates at <https://cglobal.us/certification-of-products-from-sustainable-agriculture/>

5.1.4. Modern land-use planning

As noted throughout earlier Parts, **supportive law and policy frameworks for sustainable agriculture span many sectors** involving economic development, social inclusion and environmental protection. This means that an essential feature of sustainable agricultural law and policy frameworks is the authority and associated mechanisms for comprehensive and integrated planning for land use and use of natural resources.

National public sector land use planning has long existed as a working concept in most countries. From the beginning, approaches to land use planning differed depending on local political, geographic, and socio-economic circumstances that created the need. Early land use plans were in response to specific urban problems or issues (housing, sanitation, infrastructure). Gradually, in the 1970s and 1980s, planning processes evolved as rural land use conflicts grew and special environmental concerns needed distinct planning attention for such issues as watershed conservation, wildlife management, or protected areas. In the 1990s, as international policies broadened to issues of sustainability, land use and spatial planning came to be seen as one of many tools to better integrate economic and ecological issues into the country's overall planning framework.¹⁴⁷ The conventional focus mostly remained on specific issues, however, rather than on comprehensive, integrated land use and spatial planning.

Modern elements of land use and spatial planning. Since the 1990s, advances in international law, science and technology, and governance triggered efforts by countries to revive and reframe (modernise) their planning systems to respond to opportunities as well as obligations, particularly under the CBD and UNFCCC. These efforts took on different labels beyond simply 'land use planning' to include such instruments as national adaptation plans, protected area system plans, national

biodiversity strategy and action plans, national environmental action plans, and national integrated development plans.

Today, **transition to modern land use and spatial planning systems** to address growing conflicts and global change issues has involved incorporation of new elements guiding land use planning which are now recognised as essential for achieving sustainable development goals. To ensure implementation in land use planning processes, these elements need attention in law and policy instruments authorising and guiding national land use planning. They include:¹⁴⁸

- A **longer-term planning horizon** broken down into near-term (roughly 10–25 years), medium-term (30–50 years), and long-term (75–100 years), mainly to adequately address climate change;
- **Integration of land use and spatial plans** across policies and plans at all levels of government and all sectors at each level;
- Use of the **ecosystem-based approach**, particularly to reflect biodiversity and climate change adaptation needs;
- Use of the **precautionary principle as a core element** in decision making, mainly to deal with uncertainties and risks especially from climate change;
- Requirement that **land use and spatial plans incorporate conservation plans** of all types and reconcile other formal or informal ('soft') plans that have spatial aspects, including climate change adaptation plans and national biodiversity strategies and action plans.

Zoning: Integrated land use and spatial planning include the more specialised tool of land use zoning that commonly is legally binding. As with most land use planning systems, zoning

¹⁴⁷ For an analysis of land use and spatial planning law and policy, its evolution and role today with climate change and biodiversity conservation, see Lausche (2019).

¹⁴⁸ For a more detailed discussion, see Lausche (2019, pp. 49–59).

authority is grounded in law. Authority and integration commonly should span the various tiers of government from local to national to facilitate consistency and compatibility across these levels. In light of new and emerging global issues, zoning tools are particularly important for addressing land use issues that can facilitate climate change mitigation and adaptation strategies as well as for biodiversity conservation, and to mitigate disaster risks. Zoning as a special land use planning tool for agricultural land can attach specific protections for soils, water, flora and fauna in relevant impact zones, provisions that are essential for sustainable land use (Oglethorpe, 1998).

For example, **through zoning regulations, it is possible for governments to promote sustainable land use practices, land use restrictions in environmentally sensitive areas, and incentives for agroecological farming practices.** Likewise, the different categories of land tenure will determine who uses the land and how the land is managed, which in turn can determine the type and degree of environmental and land restoration.

Land tenure: The **types of land tenure in place for a particular jurisdiction** is also an important input to decisions about zoning, and what can and cannot be done on the land.¹⁴⁹ As concluded by FAO in a 2002 study of land tenure and rural development, land rights issues, including secure land tenure, are fundamental to promoting worker productivity and commitment to practicing sustainable agriculture over the long-term (FAO, 2002). People who have extensive rights to agricultural land are generally more able to enjoy a sustainable livelihood than those who have only limited rights to land (FAO, 2002). Conversely, the lack of clear rights can reduce the incentive to implement long-term resource measures (FAO, 2002). Land tenure is categorised by FAO as private, communal, open access, or state.¹⁵⁰ Particularly for small-scale

and Indigenous farmers, **land tenure rights are essential to enable women and men farmers to undertake practices for sustainable agriculture**, be free from hunger and poverty, and live in dignity. At the international level, frameworks, such as FAO's Voluntary Guidelines on Responsible Governance of Tenure of Land, provide guidance to countries on agricultural land use so that it contributes to, rather than undermines, food security.¹⁵¹

Given the critical need for certainty about land tenure and land rights to support farmer's ability to practice sustainable agriculture, **national law frameworks should include clear and secure tenure arrangements and transparent administration of tenure rights.** Policies backed up by legislation need to balance the goal of ensuring land tenure security for the poorest and most marginalised farmers while supporting productive and sustainable use of land by those with more resources. Moreover, legislation should address situations where there may be overlapping rights over the same resource, for example, different uses in different seasons (FAO & UNEP, 2020). Land rights should likewise be respected and extended to support programmes in agriculture to ensure that such programmes do not reinforce discrimination against women, minorities and other vulnerable groups, but instead help to overcome it (FAO, 2002). This requires identifying what rights are recognised within an area, how these rights are organised, and whether adequate legal and institutional arrangements exist to determine who has rights to land, for how long, for what purposes, and under what conditions (FAO, 2002).

Legitimate tenure rights need to be also legally recognised, where communities use the land and related resources as commons, or where Indigenous communities have collective rights, including customary rights. In such cases, the planning and zoning legislation

¹⁴⁹ See, for example, FAO (2002, p. 23).

¹⁵⁰ In practice, according to FAO tenure studies, most forms of holdings may be found within a given society, for example, common grazing rights, private residential and agricultural holdings, and state ownership of forests (see FAO, 2002, p. 8).

¹⁵¹ For further discussion, please see [chapter 3.1](#).

may give authority to local community or Indigenous entities, as the case may be, to take over governance of the commons or oversee collective rights, so long as there is inclusivity and accountability along with the sustainable management goal.

Using Nature-based Solutions to land use planning.

In recent years, a relatively new concept emphasising natural resource management using Nature-based Solutions (NbS) has gained much attention for addressing the multiple challenges of sustainable development, especially with climate change and biodiversity conservation. The theory behind NbS is grounded in the understanding that ecosystems provide a wide range of benefits, including carbon sequestration, water purification, soil fertility enhancement, and habitat provision, which can be utilised to address various environmental and social issues.

IUCN defines Nature-based Solutions as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (Cohen-Schacham et al., 2016, p. 5). The concept

encompasses a range of interventions that in many cases have been used for decades, are based on Indigenous knowledge, or were known under different names like conservation agriculture. Often, the term ‘Nature-based Solutions’ is used as an umbrella concept to cover a range of ecosystem-related approaches including ecosystem-based adaptation, natural climate solutions, and green infrastructure. (Iseman & Miralles-Wilhelm, 2021, p. 9).

Many of these practices align with sustainable agriculture, particularly the principles of agroecology. NbS encompass a broad range of interventions that can be applied directly to food and fibre production. In addition to the benefit to nature, climate, and biodiversity, these interventions should provide economic benefit

to the producer, in terms of increased yields or reduced costs, in addition to broader societal benefit.

For NbS to be integrated into land use and spatial planning and plans supporting sustainable agriculture, the concept needs to be grounded in land use planning and zoning law and policy. Some examples of key provisions important to consider land use planning law, policy, and regulatory frameworks include:

- Designation of specific **zones for agricultural use and conservation**, ensuring that prime agricultural lands are protected from urban sprawl and development, and siting of farms to emphasise potential for nature-based management (FAO et al., 2022);
- Promote the **integration of green infrastructure on agricultural lands** into zoning laws to promote the use of natural elements, such as hedge rows, vegetated open channels (swales) to reduce runoff and trap pollution, or rainwater harvesting;
- Establish **buffer zones** around agricultural lands to protect them from incompatible land uses and serve as habitat corridors for wildlife and to promote biodiversity;
- Encourage **agroforestry practices** integrated into agricultural landscapes to improve soil fertility, increase biodiversity, reduce erosion, and increase carbon sequestration;
- Emphasise **conservation agriculture** to minimise soil disturbance, provide permanent soil cover, improve soil organic carbon, use crop rotation or diversification to improve soil health, water retention, climate mitigation, and biodiversity conservation;
- Promote **restoration and sustainable management of wetlands**, and prevent wetland conversion, within agricultural landscapes as part of land use zoning regulations;

- Develop **incentive programmes**, such as grants, tax credits, or subsidies to implement Nature-based Solutions;
- Develop **educational programmes and extension services** for farmers, landowners, policymakers, and the general public to promote support and action on the use of nature-based solutions for sustainable agriculture;
- Encourage or promote cooperation among agencies across affected sectors and stakeholders to ensure agricultural activities do not degrade the surrounding environment. For instance, enhancing coordination between environmental and agricultural sectors can address conflicts and inefficiencies, leading to integrated approaches that balance productivity and conservation;
- Facilitate international cooperation and collaboration related to sustainable agriculture agreements, guidelines, research, networking, and knowledge sharing. In this context, establishing partnerships between countries to share best practices on sustainable farming techniques, participating in international research initiatives to develop innovative solutions tailored to specific environmental conditions and agricultural needs, and en-

gaging in cross-border networking events and conferences are actions that could significantly enhance global agricultural sustainability. These efforts can lead to the dissemination of effective strategies, foster the adoption of cutting-edge technologies, and promote collaborative approaches to addressing common agricultural and environmental challenges.

5.1.5. Disaster risk management

As with the topics mentioned above, the **law and policy framework covering disaster risk management normally cuts across several sectors and risk-related activities** facing the country overall. For purposes of agriculture, the international instrument Sendai Framework for Disaster Risk Reduction (discussed in [chapter 2](#)), adopted by United Nations Member States, is particularly important.

Countries working to strengthen their national law and policy regimes for disaster risk reduction as part of achieving sustainable agriculture should **consider the guidance and advice provided by the Sendai Framework**, including: an integrated risk management approach; resilient infrastructure and livelihoods; ecosystem-based approaches; community participation and capacity building.

5.2. Related legal and policy frameworks on water and soil management

An enabling context for sustainable agriculture requires supporting legal and policy frameworks on water and soil management that are connected and aligned to frameworks previously described. An **integrated understanding of carbon, nitrogen, and water cycling in the soil-plant-atmosphere continuum is crucial** to adapt to current and future changes and challenges, including

sustainable production of food, feed, fuel, and fibre in a climate change scenario (FAO, 2020a).

Achieving Sustainable Land Management has never been more important as it relies on the establishment of practices that foster improved functions that enable ecosystem services and biodiversity (FAO, 2017). Soil organic friendly management practices, notably, are essential not only to improve land health and enhance

resilience and food security but also to mitigate climate change.¹⁵²

The Paris Agreement,¹⁵³ the Koronivia Joint Work in Agriculture,¹⁵⁴ and the recent Intergovernmental Panel on Climate Change (IPCC) Special Report on Climate and Land (IPCC, 2019) have also led to the development of an enabling political-institutional environment in that regard.

5.2.1. Water management

Water is a critical input for agricultural production. Agriculture's goal of achieving sustainability depends on ensuring productive and sustainable use of freshwater and rainwater. The discussion below gives an overview of law and policy issues related to water management and use, including water-related climate adaptation.

Water management. The importance of water management for sustainable development is recognised in SDG 6: Ensure availability and sustainable water management and sanitation for all. Today, agriculture is the world's largest water user, accounting for more than 70% of global withdrawals, which is expected to increase (FAO, 2020b). Irrigated agriculture is, on average, at least twice as productive per unit of land as rain-fed agriculture, thereby allowing for more production intensification and crop diversification. While irrigated agriculture is the primary agricultural user, according to a 2020 FAO report on water and agriculture, around 41% of current global irrigation occurs at the expense of environmental flow requirements (FAO, 2020a). A particularly critical issue in the foreseeable future is increased competition for water resources due to population growth, urbanisation, and climate change. To ensure sustainable water management, law and policy may include:

- Authority and responsibilities for setting objectives and mechanisms for water planning, ensuring policy coherence for the overall water domain, and integrating policies, laws, and institutional actors in agriculture, trade, energy, environment, and industry;
- Water protection, considering the geographic and ecological functions of the water bodies, and projected climate-related impacts on flows, timing, and quality;
- Authority to set and monitor water allocation based on national goals, and where sustainable agriculture is a major economic activity, irrigation for agriculture also needs to be an explicit priority for allocation, as informed by water accounting.

Tenure arrangements in legislation or in customary rules also affect access to water resources, water management, and the relationship among water users (Hodgson, 2016). Water tenure arrangements can originate from legislation, regulation, decrees, judicial decisions, and customary and religious practices and laws. To the extent applicable, customary, religious, or de facto practices should be recognised or reaffirmed in statutory law. This recognition is especially crucial for catchment-based water management, a community-led approach that can play a key role in sustainable agriculture and enhancing natural water retention. FAO (Jacob et al., 2023, pp. 16–17) has identified the following broad categories of different water tenure and rights regimes around the world:

- **Customary water tenure** where the right to take and use water resources is regulated by customary law, with rules originating from the community in which it is applied;

¹⁵² FAO (2020, p. 1) outlines the magnitude and rate of carbon sequestration in soils can vary greatly, depending on the different land uses and practices, soil characteristics, vegetation, topography and climate, among other soil forming factors and processes, which add to the many challenges for quantifying SOC stocks and changes.

¹⁵³ For the text of the Paris Agreement, see: https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

¹⁵⁴ The Koronivia Joint Work in Agriculture (KJWA), a landmark decision under the United Nations Framework Convention on Climate Change, recognises the potential of agriculture in tackling climate change. For more information, see: www.fao.org/koronivia

- **‘Traditional’ land-based formal water rights:** Links water rights to land ownership that arises from laws tied to land tenure;
- **‘Modern’ permit-based water rights based** on modern water laws or water codes that provide permits for most uses, an increasingly necessary regulatory tool to manage more demand than supply and fluctuating water quantity or quality (with climate change or shifting populations). Legislation should authorise flexibility so that permits or licenses can be adjusted for changes in quantity to quality, due to climate change and other factors.
- **Water rights created through direct investment contracts** between a host country government, ministry, or agency and an investor, usually foreign;
- **Informal water tenure** where users access water resources through informal or even illegal arrangements that are tolerated, for example, because the legal system is not adapted to deal with these situations.
- Water laws in some countries may contain provisions that address how conflicts between customary rules and statutory laws are resolved.

Environmental protection concerns may trigger social and Environmental Impact Assessments, a standard requirement, which also will also need to be authorised by law, either in water or general environmental legislation, to consider **projected climate change impacts on the water resource**. Issues assessed may include distinct sustainability criteria, whether for surface or groundwater, and the extent to which such uses are in furtherance of national priorities and goals, including sustainable agriculture (FAO & UNEP, 2020).

Climate adaptation. A key mechanism for climate adaptation to address water demand and changes in availability changes caused by climate change impacts is to require the latter to be considered in basin plans. The plan can include an identification of the risks to the condition, or continued availability, of the basin water resources for agriculture, including those that arise from climate change effects.

According to the 2010 UN General Assembly Resolution 64/292, the **right to water is a self-standing right**. This Resolution explicitly “recognises the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights” (UNGA, 2010, p. 2). Specific provisions in law and policy should consider the following water tenure and rights issues:

- Water-related legislation should provide mechanisms to ensure the security of water rights, including provisions about gender or social discrimination, as well as provisions on water allocation as a fundamental part of legal frameworks for sustainable agriculture, regulating how water resources are used for agricultural practices, and water accounting among the full range of users (FAO & UNEP, 2020).

Legislation can empower relevant authorities to **temporarily control, limit or prohibit the use of water during periods of water shortage**. Provisions may include very specific directions, such as limiting water use, requiring the release of stored water, and prohibiting water works. Other measures to support climate adaptation include legislative provisions that increase the capture and storage of surface runoff.

Water legislation may include **authorisation of drought risk assessments and associated adaptation mechanisms** for periodic or long-lasting droughts periodically updated as scientific data change. Similarly, flood risk assessments may be required, including provisions to assess potential adverse consequences of future floods on human health, the environment, and agricultural use. Further, water authority may need to include assessing the impact of water-related disasters on other sectors

and how sustainable agriculture practices may need additional adaptation measures to accommodate other water use priorities (FAO & UNEP, 2020).

5.2.2. Soil conservation and management

Soil also is a vital part of the natural environment from which most of the global food are produced. In addition, soil also provides essential ecosystem services important for water regulation and supply, climate regulation, biodiversity conservation, carbon sequestration and cultural services. In recent years, as **soils have come under pressure** to supply food for a growing population, competing uses for the land, and growing climate change uncertainties, attention have been renewed to strengthen policies and laws for soil conservation and management.

According to a 2022 UN report, the **global extent of land degradation** is estimated at between 20–40% of the total land area, directly affecting nearly half of the world's population and spanning the world's croplands, drylands, wetlands, forests, and grasslands (UNCCD, 2022). As of the first quarter of 2024, an updated estimate by The World Counts website states that over 75% of the Earth's land area is now already degraded, and over 90% could become degraded by 2050 if deforestation, overgrazing, intensive cultivation, urbanisation, and other harmful practices persist.¹⁵⁵

FAO's Global Soil Partnership¹⁵⁶ established in 2012, as discussed in [chapter 3](#), has the key objective to improve the governance and promote sustainable management of soils to all stakeholders, from land users to policymakers. Its focus includes capacity-building in developing countries on digital soil mapping and establishing national soil information systems. In 2016, FAO member countries endorsed Voluntary Guidelines for Sustainable Soil Management (FAO, 2017). The target audience

for the Guidelines includes government officials, policymakers, farmers, pastoralists, forest and land managers, extension services and agricultural advisors (FAO, 2017). These Guidelines are heavily focused on policy and legal measures that need increased attention in national systems to reverse ongoing soil degradation and to better protect and use soils sustainably. Among the main recommended actions are the following:

- the need for special legislation to protect soils for their significant ecosystem services (including high soil carbon stocks, high biological diversity or high agricultural suitability);
- provisions to prevent conversion of these areas for settlements and infrastructure (FAO, 2017).

The Guidelines highlight actions to provide an **enabling environment** for countries to advance sustainable soil management:

- Establishing or strengthening inclusive sustainable soil management-supportive agricultural/environmental policies;
- Where appropriate, inclusive policies to promote sustainable soil management should be linked to agricultural and environmental policies, so that their implementation provides multiple benefits. If existing, these policies can be reviewed, as appropriate, to mainstream sustainable soil management;
- Increasing responsible investment and positive incentives aimed at promoting sustainable soil management (FAO, 2017).

A 2020 FAO/UNEP report on legislative approaches to sustainable agriculture, emphasised the importance of **strengthening**

¹⁵⁵ The World Counts is a Denmark-based website that aggregates numbers from research institutions, news services and a variety of organisations around the world, tracking population, the consumer economy and earth resource degradation, including land degradation. For further information, see: <https://www.theworldcounts.com/challenges/planet-earth/forests-and-deserts/global-land-degradation>

¹⁵⁶ For an overview of FAO's Global Soil Partnership, see: <https://www.fao.org/global-soil-partnership/about/why-the-partnership/en/>

national law and policy regimes for soil (FAO & UNEP, 2020). These include the need for legislation to set up means to balance competing demands on the soil, ways to protect or rehabilitate the resource, requirements for soil monitoring and inspection, and setting soil standards and indicators of soil fertility, and measures to protect and restore soil organic carbon.

5.2.3. Agricultural occupational safety and health

Agricultural health is the study of environmental, occupational, dietary, and genetic factors on the health of farmers, farm families, pesticide applicators, and others who work with and are exposed to agricultural chemicals. Agricultural intensification has been essential to feed the world's growing population, but it has also brought its own **risks for people's health**, including diseases spread from animals to humans, water- and food-borne diseases, occupational hazards, and natural resource degradation and overuse.

As a national policy, **agricultural strategies should be designed to minimise risks and maximise the benefits of agricultural workers to nutrition and health across the entire value chain**, from production to consumption. However, improving health in agriculture to meet these goals faces a number of difficulties. First, many agricultural workers are only poorly protected by national labour law, and some countries specifically exclude the agricultural sector from their general labour legislation or from occupational safety and health (OSH) legislation. Second, in countries where some relevant legislation does exist it is usually poorly applied in practice and inadequately enforced by labour inspectors. Third, national systems for improving OSH in agriculture are also inadequate in many countries and competent OSH advice is often scarce (ILO, 2011). Many farmers and workers are unaware of their obligations, rights, and responsibilities and fail to comply with such OSH legislation that does exist.

In 2011, the ILO adopted a Code of Practice for Safety and Health in Agriculture (ILO, 2011). This Code of Practice includes an entire chapter devoted to specific elements governments need to consider for developing comprehensive OSH legislation that affords protection for all workers in the sector, irrespective of their gender and employment status, in accordance with the Safety and Health in Agriculture Convention, 2001 (No. 184). The Convention lays out key elements (ILO, 2011, p. 8) for a legislative framework for a national system for OSH in agriculture comprising a range of organisations and mechanisms for a national OSH framework, including:

- a. Authorities or bodies responsible for OSH and for ensuring compliance with national laws and regulations, including systems of inspection;
- b. Information about hazards and risks in agriculture and how these may be addressed, and related advisory services;
- c. Occupational safety and health training for employers and workers;
- d. Occupational health services, available in rural areas as well as urban ones;
- e. Mechanisms for the collection and analysis of data on occupational injuries and diseases;
- f. Provisions for collaboration with relevant insurance or social security schemes covering occupational injuries and diseases; and
- g. Support mechanisms for a progressive improvement of OSH in very small agricultural enterprises, such as subsistence farms, and in the informal economy.

5.2.4. Food waste

More than one-third of all the food produced globally, using over a quarter (28%) of the world's agricultural area, are wasted each year.

This represents a market failure, valued at over US\$ 1 trillion annually, and an environmental failure, generating an estimated 8–10% of global GHG emissions (UNEP, 2024) (Box 3). Food is lost in every step of the food ‘life cycle’ – from agricultural production in the field, postharvest handling and storage, to processing, distribution, consumption, and end of life. In agricultural fields, food is lost due to crop pests and diseases and because of inefficient harvesting methods. Food is wasted as well through transportation, storage, and deliberate discarding of food in shops, supermarkets, and households. **The largest source of food waste is in the production phase**, where over 500 million tonnes are lost due to, for example, crop pests and ineffective harvesting and irrigation. This is followed by ‘postharvest handling and storage’ and ‘consumption’, both with around 350 million tonnes. These three phases account for around 75% of all food waste (UNEP, 2024).

Tackling food loss and waste is critically important for food security, the climate, and sustainability of the planet’s food system. Recognising the gravity of food waste globally, the SDGs (discussed in [chapter 2](#)) includes target on reducing food waste. SDG 12 (Ensure sustainable consumption and production patterns) includes Target 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses (UN, n.d.d).

In 2022, **FAO and UNEP together called for concerted action to address this growing problem**, in view of the latest *State of Food Security and Nutrition in the World 2022* (FAO et al., 2022) (briefly discussed in [chapter 2](#), SDGs). That assessment reported significantly increased human impact from food waste – an estimated 828 million people facing hunger in 2021 – an increase of about 46 million over 2020 and 150

million since 2019 (FAO et al., 2022). Statistics were also showing that food loss and waste was accounting for 8–10% of global GHG emissions, further contributing to an unstable climate and extreme weather events, such as droughts and flooding, negatively impacting crop yields and causing supply chain disruptions.¹⁵⁷

Effective **national law and policy regimes are essential to address food waste**

comprehensively, involving multiple stakeholders and strategies to tackle this global challenge. FAO and UNEP have urged governments to get serious about seriously tackling food waste along the entire food chain, recommending new or strengthened law and policy to improve efficiency in production, provide support for improved marketing and distribution (including donations) to help reduce food waste, and set standards and guidelines throughout the entire food waste chain for management of surplus and to avoid sending food to landfills (FAO & UNEP, 2020). Options for law and policy action at the national level include:

- Developing regulations with standards for food production, distribution and retailing to minimise waste at various stages of the food change;
- Providing tax incentives to businesses that implement practices to reduce food waste;
- Supporting education and public awareness programmes to inform consumers of negative environmental, social, and economic impacts of food waste and ways to reduce waste;
- Facilitate collaboration and partnerships among government agencies and other stakeholders to coordinate approaches to tackling food waste.

¹⁵⁷ For further information, see FAO’s website on food loss and waste at: <https://www.fao.org/newsroom/detail/FAO-UNEP-agriculture-environment-food-loss-waste-day-2022/en>

Box 3

International Food Loss and Waste Indexes of FAO and UNEP

Both FAO and UNEP have established indexes for food loss and waste globally and by country. The actions are in response to the SDG 12, Target 12.3, Indicator 1a, a Food Loss Index, and Indicator 1b, a Food Waste Index.

As co-custodians for this target, the FAO and UNEP developed separate indicators for food losses and food waste measurement respectively. The FAO developed a Global Food Loss Index (GFLI) monitoring Food Losses on a global level for a basket of key commodities in the food systems, including crops, livestock, and fisheries products, focusing on the supply stages of food chains and measures changes in percentage losses over time. The goal is to aid policymakers with such data to improve the food supply system efficiency against food losses. FAO released its first Food Loss Index report in 2018 (FAO, 2018c). FAO's long-term approach is to support countries in collecting food loss data with recommendations to develop loss surveys along the value chain.

UNEP began its Food Waste Index in 2021 with its first report that year. Its most recent report was released in 2024.¹⁵⁸ Its index measures food and inedible parts wasted at the retail and consumer levels (household and food service) and allows countries to report on manufacturing food loss not captured by the Food Loss Index (for example where more than one commodity is combined to produce complex food products). It does so by presenting the most comprehensive food waste data collection, analysis and modelling to date, generating new estimates of global food waste; and publishing a methodology for countries to measure food waste, at household, food service and retail level, to track national progress towards 2030. It is intended that countries using this methodology will generate evidence to build a national strategy on food waste prevention that can track changes in food waste over two- or four-year intervals and make meaningful comparisons between countries.¹⁵⁹

5.2.5. Food safety

In many countries, there is a broad-based legal framework covering food safety and quality standards across sectors dealing in any way with food, to protect human health and the environment. Moreover, international law and policy instruments related to food safety and quality, including for agricultural produce, give guidance to countries especially in relation to agricultural trade.

Such international instruments as those noted in the next sections set standards and guidelines for food safety and quality, with many directly or indirectly influencing agricultural practices to ensure the safety and security of food production systems. Countries interested in pursuing multilateral or regional trade in their agricultural products would normally incorporate such agriculture-related standards and guidelines

as part of their broader food safety and quality legislative framework.

Foremost among these international instruments is the Codex Alimentarius (Food Code) established by FAO and WHO (discussed in [chapter 2.2.3](#)) and the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) (mentioned in [chapter 3](#)).

WTO trade and food safety rules. The WTO oversees agreements related to international trade, some of which have implications for food safety and agricultural products. For instance, the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) sets out the basic rules for food safety and animal and plant health standards aimed at protecting human, animal, and plant health.

¹⁵⁸ For more information about UNEP's index, see: <https://www.unep.org/resources/publication/food-waste-index-report-2024>

¹⁵⁹ The Food Waste Index has a three-level methodology, increasing in accuracy and usefulness of data, but also increasing in the resources required to undertake them (see UNEP's [Food Waste Index](#), p. 21).

Key messages of Chapter 5

1. Whether sustainable agriculture is legislated through a broad combination of national laws and policies, a single umbrella agricultural law, or a hybrid framework, **the prevailing legislative framework should reflect a systemic perspective**. This perspective should account for the sustainable use and protection of natural resources and ecosystems, the implementation of good governance principles, and ensure inclusive and participatory processes, particularly involving civil society organisations, academia, small-scale farmers, and other groups typically excluded from these processes.
2. The wide variety of national instruments to support sustainable agriculture, such as regulations, taxes, incentives, zoning restrictions, plans, and others, must be **responsive to changing environmental, social, and economic conditions that enable sustainable agriculture**. National policies need to be flexible to these conditions and shift in approaches for promoting sustainable agriculture, without resulting in setbacks, rather allowing for a more accelerated transition. These processes must be accompanied by increased research and development to understand how policies can be more effective and how they can better adapt to new knowledge. Public policies and programmes should prioritise support for small-scale farmers and Indigenous communities, with social equity and justice principles, including appropriate access to land and water, as well as incentives for sustainable farming.
3. **Threats from climate change and biodiversity loss have increased the importance of national and policy frameworks on sustainable agriculture**, primarily tied to related global commitments and conventions. This has led to varied transitions in terms of speed and scope, aimed at reducing support for conventional agriculture and increasing the promotion of sustainable agriculture. As mentioned before, the NDCs, NAPs, and NBSAPs, with their periodic updates, present a great opportunity to accelerate the transition toward sustainable agriculture. National legal and policy frameworks can commit to promoting agroecological and similar sustainable agriculture approaches as part of their commitments on climate change adaptation and mitigation, as well as biodiversity conservation.
4. **Strengthening and enforcing laws related to protecting the environment from the negative impacts of agriculture require interconnected frameworks across different sectors**, including regulations for pesticide and fertiliser use, water quality and management, soil conservation and restoration, biodiversity conservation, disaster risk management, agricultural occupational safety and health, food waste, and food health. This complex network of policies requires the involvement of various government sectors and society, such as agriculture, environment, public health, social inclusion, among others.
5. **Land use planning can promote climate action and biodiversity conservation in sustainable agriculture** through various mechanisms, such as zoning regulations, tenure rights, and financial incentives. Land use plans have evolved to incorporate more environmental issues and can be fundamental in prioritising the preservation of agricultural land, promoting mixed land use practices, and encouraging sustainable farming methods. Land tenure rights are also essential for enabling farmers to adopt practices for sustainable agriculture. Additionally, planning and zoning legislation can grant authority to local communities or Indigenous entities to manage common resources, oversee collective rights, and promote sustainable agriculture.

6. The **case studies expose**, Brazil, Germany, Kyrgyzstan, Uganda, and Viet Nam, **highlight the diverse approaches and challenges in integrating sustainable agriculture laws and policies**. Each country's unique context requires tailored solutions, but the shared experiences provide valuable

insights. Effective sustainable agriculture requires strong political commitment, stakeholder engagement, and evidence-based policies. These efforts are essential for achieving broader objectives of food security, environmental health, and long-term sustainability.



6. Concluding messages

1. There is an **urgent need to accelerate and spur the transition towards sustainable agriculture, and design or strengthen corresponding policy and legislative frameworks**. On one hand, this need is heightened by unprecedented environmental challenges – mainly the need to mitigate and adapt to climate change. On the other hand, the negative effects of intensive agriculture, which have led to an increase in the use of agrochemical inputs, mechanisation, irrigation, and new breeds, have exacerbated damage to critical habitats and ecosystems, biodiversity and soil, and water quality, among other issues.
2. **Sustainable agriculture has been defined in various ways**. Although there is no consensus on its definition, it is considered to include the three central pillars of sustainable development – environmental, social, and economic – to promote according to the FAO definition the “management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations” (FAO, 2022a, p. 1).
3. **This allows for a wide range of approaches to sustainable agriculture in policy and legislative frameworks**, such as agroecology, nature-inclusive agriculture, permaculture, biodynamic agriculture, organic farming, conservation agriculture, regenerative agriculture, among others.
4. The **urgency to accelerate the transition towards sustainable agriculture, as well as the diverse range of perspectives on how to achieve it, are reflected in the evolution** of global conventions, international organisations recommendations, regional agreements, and national policies. Over the past decades, they have incorporated different approaches, ranging from those that promote incremental transitions, such as sustainable intensification, to more transformative ones such as agroecology.
5. The **Rio Conventions, in particular the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD)**, present significant opportunities to advance sustainable agriculture within national legal and policy frameworks. As binding agreements with global political momentum and periodic review processes, they create obligations that evolve over time and can become priorities on national agendas.
6. **Trade rules and agreements**, agreements, in general, also rarely include strong commitments to transitioning to sustainable agriculture. However, the European Union shows some progress by establishing major sustainability standards for its trading partners worldwide, both through its numerous trade agreements and with other trade requirements, for example those related to the Regulation on Deforestation-Free Products.

7. The evolution in approaches to promote sustainable agriculture, such as sustainable intensification, organic agriculture, or agroecology, has been reflected in the dynamism and changes in recommendations and technical advice proposed by various organisations (e.g. FAO) and in the policies adopted by countries and regions, such as the European Union's Common Agricultural Policy.
8. This constant evolution in recommendations, combined with the changing environmental, social, and economic conditions that increasingly create uncertainties about current and future requirements for achieving sustainable agriculture, means that **legal and policy frameworks must allow for adaptive management and flexibility** to facilitate adjustments.
9. Policies supporting conventional agriculture began to be integrated in national frameworks in the late 19th and early 20th centuries, traditionally favouring conventional practices through measures such as subsidies for agricultural inputs and biofuels. **Shifting support and subsidies from conventional agriculture to sustainable agriculture is essential** and can be achieved through a broad range of instruments. These include the commitments and plans related to climate change and biodiversity, as well as policies for water and land quality management, land use and land tenure, and prioritised support for small-scale farmers and Indigenous communities. Equally important is fostering greater research related to diversified and sustainable systems, as the current focus has largely been on productivity increases and industrial agricultural products (HLPE-CFS, 2019).
10. One of the critical aspects that must be considered to promote sustainable agriculture in national policy frameworks is **leveraging government food procurement**. For example, school meals programmes can serve as a powerful mechanism to create stable markets for sustainable agricultural products, offering a consistent demand that can incentivise and finance the transition towards more sustainable practices. By integrating locally sourced, sustainably produced foods into school meals, these programmes can not only support small-scale farmers but also contribute to healthier diets for children. The long-term contracts often associated with school feeding programmes can provide financial security to farmers, encouraging them to adopt sustainable methods that might require initial investments. This approach aligns with the broader goals of food security and sustainable development, creating a synergistic effect that supports both education and agriculture sectors (HLPE-CFS, 2019; WFP, 2022c).
11. The **case studies from Brazil, Germany, Kyrgyzstan, Uganda, and Viet Nam reveal a range of strategies and challenges** in implementing laws and policies for sustainable agriculture. Success in sustainable agriculture hinges on robust political will, active stakeholder participation, and policies grounded in evidence and local conditions. Each country has very specific needs that demand tailored solutions, as many approaches, such as agroecology, heavily depend on specific ecosystem conditions and the knowledge and capacities of local communities. This presents a significant challenge for easily scaling up and expanding sustainable agriculture practices. Consequently, it requires more coordinated efforts across various national sectors and among multiple international organisations.

12. Facilitating the transition to sustainable agriculture demands a comprehensive multi-stakeholder approach

that actively involves the agriculture, conservation, and environmental sectors in both policy design and implementation. It is essential to systematically address intersectoral linkages, encourage cross-sector collaboration, and assess the synergies and trade-offs between economic, social, and environmental dimensions. Overcoming challenges, such as limited institutional capacity, and ensuring effective stakeholder coordination are

crucial for successful policy implementation. Strategic partnerships and multi-stakeholder platforms play a critical role in mobilising resources and fostering an inclusive approach that enhances agricultural sustainability and supports small-scale producers (FAO, 2018d).

- 13.** Unless trade and sustainability are brought into closer alignment, efforts to advance sustainable agriculture will remain fragmented, vulnerable to shocks, and unable to deliver the resilience that farmers, ecosystems, and consumers need.



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Annex – Case studies

Case study 1 Brazil by Ian Hannam

1. Introduction

Brazil is a large country spanning several climatic zones. With generous supply of fresh water, sunshine, and a rich biodiversity, it has become one of the world's largest producers of food. The Brazilian experience of combining public policies, institutional and human development, and a science-based strategy to promote agricultural innovation in a tropical environment took off in the 1970s. At that time, faced with massive food insecurity, the country prioritised alleviating hunger and malnutrition. Assisted by innovation, Brazil was able to meet food security challenges, by continuing to improve food production to become one of the largest exporters of agricultural products to over 150 markets around the world.

Despite contributing greatly to global food security, Brazil still faces enormous challenges. Today, its agriculture systems are required to focus on solutions to environmental problems as well as the economic and social dimensions of sustainability. The United Nations 2030 Agenda for Sustainable Development and its Goals (SDGs) indicate the need for policies, science and capacity building to conserve Brazil's natural resources, including soils, water, forests and biodiversity, and to deal with the negative effects of global climate change on agricultural production, food, and environmental security (Lopes, 2021).

a) Livelihoods depend on agriculture

Brazil is a major player in global agricultural trade, accounting for 7.3% of global agricultural exports. The sector represents 14% of the country's GDP and the whole agricultural chain amounts to 28%, employing almost **18 million people** (Mordor Intelligence, 2025). Employment in agriculture is the share of individuals working in agriculture, hunting, forestry, and fishing, to produce a good or a service for profit or pay from the total employed. The data covers people working in a certain period, or not working, as a result of being temporarily absent from a job, or in a working-time arrangement.

In Brazil, employment in the agricultural sector as a share of total employment declined by 8% in 2023. This marks the lowest share in the period 1991–2023. Notably, the share has been continuously decreasing over the last years (World Bank, n.d.a).

b) Percentage of rural families

In 2022, the rural population (% of total population) in Brazil was reported at **12%**, according to the World Bank collection of development indicators, compiled from officially recognised sources (World Bank Open Data, n.d.).

c) Inhabitants

Based on current projections, **Brazil's** population will peak at 229.6 million in 2045 but currently, the population growth rate has significantly decreased at 217,373,560. In 1951, the growth rate

was 3.02% and in 2019, it was 0.72%. After reaching its population peak in 2045, Brazil's population is expected to decrease slowly, starting at a growth rate of -0.01%. The country's fertility rate has significantly decreased since the 1950s when the total fertility rate was just above six births per woman. As of 2024, the birth rate was 1.77 births per woman which helps explain the decelerating population growth (UNFPA, n.d.).

Before the arrival of Europeans around 1500, between 3 and 4 million Indigenous Peoples lived in the Brazilian territory. With them came enslaved Africans and later emigrants from countries as diverse as Spain, Germany, Italy, Syria, Lebanon, China, and Japan. Marriage between different ethnicities was common in Brazil, thus giving rise to greater racial diversity. Because of this, the Brazilian natives were classified according to the different languages: Tupi, Macro-jê, Aruak, and Karib.

Most white Brazilian people are of European origin, or mostly of Dutch, French, Italian, Portuguese, Slavic, and Spanish descent who emigrated to Brazil during the colonial period. The southern region is home to a large part of the white Brazilian population, as the immigrants occupied this area. As a result, Brazil's concept of 'white' differs from that of other countries. A large part of Brazilians has Portuguese ancestry, but that does not mean that they are Portuguese. The Portuguese living in Brazil have a privileged status that allows access to the same laws, rights, and privileges as the rest of Brazilians, except in some cases prescribed in the Brazilian Constitution that guarantee individual rights for those born in Brazil. In turn, Brazilians who descend from Portuguese can easily acquire Portuguese nationality, thus having access to all the benefits of Portuguese citizens.

d) Indigenous/local communities and sustainable agriculture

Indigenous communities in Brazil are fundamental for the preservation of the environment, which also involves teaching non-Indigenous communities about sustainable development and their agricultural production. A series of initiatives promoted by Indigenous populations have helped reforest devastated regions, mixing traditional knowledge with new technologies so Indigenous populations can be as self-sufficient as possible (Schuster, 2019).

Brazilian Indigenous communities are not only in the frontline of environmental protection, but they also teach others about agricultural production, sustainable development, reforestation, and how to live in peace and harmony with nature. Partnerships with Indigenous communities that seek to maintain or enhance Indigenous land tenure practices on Indigenous-managed lands may therefore have some potential to improve national and global inadequacies in land protection for biodiversity conservation, using a mix of conventional protected areas and Indigenous-managed lands (Schuster et al., 2019).

For example, the Brazilian Ashaninka Indigenous people carry out several actions, such as recovering transformed areas due to exploitation, realising projects that manage hunting and fishing resources by creating reproduction areas and helping nature to bring back the conditions to offer resources. (Tsavkko Garcia, 2020).

The Ashaninka continue to practice their culture and knowledge of medicine, arts, and rituals. These include agroforestry projects to supply families and local schools, generating a surplus that has helped create a local market for visitors. They have fostered partnerships with local organisations around the village and the surrounding population so that they are aware of each other's role and recognise the importance of a maintaining the partnership to ensure the region's protection and development (Tsavkko Garcia, 2020).

e) Environmental impacts from agriculture

The large-scale commercial agricultural system in Brazil has been associated with widespread destruction of Brazilian ecosystems, especially the *Cerrado* and the Brazilian Amazon rainforest, as well as environmental degradation. Brazil's agricultural development has also led to land consolidation, aggravating a historical land distribution inequality. This pattern of agricultural growth has reinforced Brazil's status as one of the world's most inequitable countries in terms of income distribution, making it difficult to assert that the country is pursuing a sustainable development path (Martinelli et al., 2010).

Environmental issues are part of the agriculture support policies developed in Brazil. One of the most relevant examples is the exemption of the Legal Reserve and Permanent Preservation Areas (APP) from rural land tax (ITR). The ITR is a tax regulated by Federal Law No. 9,393/1996, which sets out the exemption of the amounts related to Legal Reserve Areas and APP, subject to the fulfilment of some requirements, such as the property, must be registered with the Rural Environmental Registry. As a national public registry compulsory for all rural properties, it aims to incorporate all information related to APP and Legal Reserve, vegetation, consolidated areas, and others, to create a database for controlling, monitoring, environmental and economic planning, and tackling deforestation. The Environmental Statement Act is a document related to the registration of the protected areas of a rural property before the Federal Environmental Agency (Brazilian NR, n. d.).

Another type of support is the payment for environmental services (*Pago por Serviços Ambientales*, or PSA), which is, essentially, a payment to farmers or landowners that manage their land, abiding by sustainable practices, and ensuring the continuance of environmental services such as the conservation of biodiversity

and water resources. There is currently no Brazilian federal law that regulates the PSA, but there are many programmes established by the public authorities conducted by the environmental agencies (Brazilian NR, n. d.).

In order to achieve sustainable agriculture, Brazil must reconcile its increasingly productive, modern tropical agricultural system with environmental preservation, social equity, and poverty alleviation in rural areas.

f) Incidence of agriculture on GDP

In 2025, the agricultural sector represents more than 8.4% of Brazil's GDP, and accounts for a 16.2% share of the total employment in the country (World Bank, 2025). In 2019, domestic crop production alone injected over BRL 360 billion into the Brazilian economy (Agência de notícias IBGE, 2020).

The share of value added by the agriculture, forestry, and fishing sectors to the gross domestic product in Brazil increased by one percentage point in 2021. With 6.6%, the share thereby reached its highest value in 1995–2021 (World Bank, 2024).

g) FAO, UNEP, IUCN metrics on sustainable agriculture

In the last two decades, Brazil has reached a level of development by numerous public policies on Food and Nutrition Security (FNS), eradication of hunger, the human right to adequate food, rural development, and strengthening of family farming, which has made the country a reference in the region, arousing great interest of the international community, particularly Latin American and Caribbean countries. This was the cornerstone of the Brazil-FAO International Cooperation Programme, established since 2008, with the aim of sharing experiences and knowledge with other countries of the region. This successful South-South Cooperation initiative, encompassing the FAO, the Brazilian Cooperation Agency of the Ministry of Foreign

Affairs (ABC/MRE), and countries from Latin America and the Caribbean, achieved 10 years of operation by 2018.

On the Brazilian government part, ABC/MRE is the institution responsible for the coordination, negotiation, approval, and monitoring of the activities planned within the framework of the programme, in which different partner ministries participate. The agency, which has more than 30 years of experience in international cooperation, coordinates the exchange of knowledge, skills, and experiences developed by Brazilian institutions and organisations, with a focus on capacity development and mutual learning among the various institutions involved. Moreover, this kind of cooperation uses comparative advances and synergies among the parties to scale up the South-South Technical Cooperation initiatives and improve their impact (FAO, n.d.a).

UNEP partners with national governments, research institutions, producer groups, retailers, and civil society in formulating sustainability goals and indicators and in developing supply chain strategies and organisation (UNEP, n.d.a).

2. Governance framework

a) Legislation

The legal framework for agriculture in Brazil is governed exclusively by federal laws under the Complementary Federal Law authorising states to regulate specific areas of law. In this context, [Law No. 8,171/1991](#) regarding national agricultural policy is relevant as it stipulates that public services relating to the agriculture sector are decentralised, so that Brazilian states, Federal District, territories and municipalities, alongside the Federal Government, all have responsibilities. Specifically, the Brazilian states, Federal District, and territories are responsible for planning, executing, and monitoring activities in agriculture. Specific entities can create incentive programmes to encourage investments in agricultural business and infrastructure. For example, the Agriculture and Food Supply

Secretariat of the State of São Paulo launched the Citizenship in the Rural Area Project in Agro Municipality. Under this initiative, mayors can submit to the Secretariat documents demonstrating actions implemented benefit the agricultural business and the rural population. In exchange, top-ranked municipalities receive various certifications and benefits such as additional budget.

Agrarian Law and sustainable agriculture.

Arable land accounts for only 23% of Brazilian agricultural land. However, Brazil is among the world's leaders in the production of soybeans, poultry, beef, cotton, corn, and orange juice, being the third biggest exporter of agro-food products after the European Union and the United States. The success of the agriculture sector has been associated with widespread destruction of Brazilian ecosystems, especially the *Cerrado* and the Brazilian Amazon rainforest, as well as environmental degradation. Brazil's agricultural development has also led to land consolidation, aggravating a historical land distribution inequality. In Brazil, the main agrarian law is the 1964 Land Statute, whose main objective is to regulate rights and duties related to rural properties and to promote agrarian reform, establishing an agricultural policy for the country (Damasceno Costa, 2016, p. 6). The law is meant to deter land grabbing, which consists of the occupation of public lands by private individuals through presentation of false documents to prove legitimacy of the property.

The best-known form of land grabbing occurs through falsification of property titles already registered in registry offices, but it could also take the form of illegal deforestation of public lands to simulate an old occupation to the point of obtaining a land title from the government itself. This second type of land grabbing takes place through the process of land regularisation, which is provided by Brazilian legislation to regulate cases in which the government itself encouraged occupation of the Amazon, where this practice was most common.

These cases are from two or three decades ago and not from contemporary situations, since this occupation policy no longer exists today. The first step towards an effective fight against land grabbing is to prevent public lands from being invaded, deforested, which ends with the government itself giving amnesty for illegal occupation of these areas by means of unreasonable land titling. A second step is the criminal punishment of gangs that illegally occupy public lands, reinstating government possession of these areas. One way to resolve this issue involves amending state laws that now make it possible for invaded and deforested land to be legally transferred to criminals (Agribrasilis, 2022).

Acquisition of agricultural land. Ownership acquisition of agricultural land in Brazil is governed by a set of statutory laws. The main laws are the:

- Federal Law No. 10,406/2002 (Civil Code);
- Federal Law No. 6,015/1973 (Public Registry Law);
- Federal Law No. 4,504/1964 (Rural Land Statute);
- Federal Law No. 5,709/1971 (governing ownership acquisition of rural land by foreign individuals, foreign entities, and Brazilian entities owned or controlled by foreigners).

Acquisition of agricultural property can also occur by means of adverse possession, which is the acquisition of ownership by occupying (possessing) real estate for an uninterrupted period without being challenged by the current owner. The period of time that is necessary for acquiring land by means of adverse possession varies from five to 15 years, depending on the type of land usage and other statutory conditions. Use rights in Brazil are divided into two main groups:

- *In rem* rights that remain linked to the real estate regardless of further ownership transfers; and

- Obligation rights, set between contractual parties.

Rural lease. A rural lease is the most common structure used by large corporations for the purposes of agricultural production in Brazil. The rural lease refers to an agreement by which the rural landowner grants the rural lessee the right to use rural real estate during a given period of time in exchange for annual rent. The rent amount must be adjusted based on monetary criteria (indexes or others), but the rent payment can be made in kind (that is, in agricultural products). Rural lessees have the right of first refusal in acquiring the leased land.

Rural partnership. A rural partnership involves different sets of contributions by each party (land, equipment, crops, structures, and labour), with one party responsible for providing the agricultural land. At the end of the determined harvest or partnership period, the partners share the produce, goods, and benefits from the performed agricultural activity in the property. This is within the maximum thresholds provided in statutory law and varies from 20% to 75%, depending on the shared structures. There is no maximum term, except in relation to the usufruct granted to legal entities. The usufruct cannot be set for more than 30 years.

Expropriation of agricultural land. Government authorities in Brazil can expropriate agricultural land on the grounds of public interest or social interest. In both types of expropriation, the owner must receive monetary compensation in advance. This usually takes place during the expropriation lawsuit filed by the government.

Public interest. Public interest expropriation cases cover matters, including:

- National security;
- National defence;
- Public health;
- Improvement in public structures;
- Provision of public services; and
- Public transportation.

Despite the extensive case list, the most usual expropriation for public interest concerns the construction of roads, electrical power lines, sewers, and gas and water pipelines.

Social interest. For the expropriation of land for social interest, the Brazilian Constitution provides that all real estate must meet its social purpose. Rural properties meet their social purpose when they comply with:

- Rational and adequate use;
- Adequate use of natural resources and the preservation of the environment;
- The provisions that regulate employment relations;
- Any use that favours the well-being of the owners and employees.

The government can also expropriate any rural property due to social interest for the purposes of agrarian reform, if the property is not meeting its social function. Rural lands meeting an 80% land occupation rate and a 100% production efficiency rate are considered productive. They are therefore ineligible for expropriation due to inadequate use, although other circumstances (for example, slave labour) may lead to expropriation due to social interest.

Management of disadvantaged areas. In Brazil, areas such as uplands and margins of waterbodies are legally protected under the Brazilian Federal Constitution and [Federal Law No. 12,651/2012](#) (Forestry Code). There are two main types of protected areas and respective restrictions on use for the purposes of agriculture: i) Permanent Preservation Areas (APP); and ii) legal reserve areas. An APP is defined as a protected area, covered or not by native vegetation, with the environmental purpose of preserving water resources, landscape, geological stability and biodiversity, facilitating the gene flow of fauna and flora, protecting the soil, and ensuring the well-being of the human population. The Forestry Code also provides a list

of what is considered an APP, where the most relevant ones are:

- The marginal bands of any perennial and natural watercourse, excluding the ephemeral ones;
- Areas surrounding natural lakes and ponds;
- The areas surrounding artificial water reservoirs, resulting from the construction of dams or impoundment of natural water courses, within the range defined in the project's environmental licence;
- The areas around the headwaters and the perennial water sources and water mines;
- Slopes or parts of these with a declivity greater than 45 degrees;
- The edges of tablelands or plateaus;
- Top of hills, mounts, mountains, and mountain ranges, with a minimum height of 100 metres and an average slope greater than 25 degrees.

It is not possible to suppress the existing vegetation or conduct agricultural activities in APPs, due to their major importance in the conservation of natural resources and ecosystems. Non-compliance attracts penalties and the obligation to repair the damage. It is also considered an environmental crime under the Environmental Crimes Law (Federal Law No. 9,605/1998).

b) Policies

Brazil has launched public policies to protect biodiversity, preserve water sources, and drive down carbon emissions. Sustainable agriculture intensification practices, promoted through low-impact innovations and sustainable land use, are reducing deforestation and degradation of other natural resources. The [2018 Brazilian Forest Code](#) is an audacious public policy that ensures protection of natural forests and water resources

within private land, whereas the **Low Carbon Agriculture Plan** (Climate Action, 2012) promotes technologies and agronomic practices that can reduce greenhouse gas emissions (GHG), raise productivity, enhance climate resilience, and preserve the environment.

Furthermore, in 2020, the **Sustainable Agriculture Finance Facility** (SAFF) was launched to promote the adoption of crop–livestock–forestry integration strategies on Brazilian farms. Farmers are given access to credit lines according to the sustainability level of their rural properties. In its first year, SAFF provided funding of approximately US\$ 68 million: US\$ 62 million was in credit for producers, and US\$ 6 million to finance certification programmes, research, technology transfer, and technical assistance. The value of the fund will increase each year and could reach US\$ 1.4 billion by 2026 (Global Innovation Lab for Climate Finance, n.d.).

c) Institutions

The **main institution responsible for agriculture in Brazil is the Department of Agriculture, Livestock and Food Supply (MAPA)**. Its mission is to promote sustainable development and competitiveness of agri-business for the benefit of the Brazilian society. MAPA stimulates the increase of agricultural production and agri-business development to meet domestic demand and form an exportable surplus. Its role includes policy formation and implementation for the development of agri-business, integrating marketing, technological, scientific, organisational, and environmental aspects, to meet the needs of Brazilian consumers and the international market. These policies are implemented in a decentralised way by the Federal Superintendencies of Agriculture (SFA) of Brazilian states, working in the areas of agricultural production and promotion and technology transfer in agricultural systems, in partnership with different institutions. MAPA is supported by the Brazilian Agricultural Research Corporation (EMBRAPA) and other institutions like the Institute of Food Technology (ITAL) in the training of people from agricultural

chains to improve the quality of agricultural products produced in Brazil and exported (ABC, n.d.).

The EMBRAPA was established by MAPA in 1973 to develop the technological foundation for a tropical model of agriculture and animal farming. One of its main responsibilities is to provide Brazil with food security and to have a leading position in the international market for food, fibre, and energy. EMBRAPA's eco-regional research unit is faced with the challenge of solving problems that are inherent to food crops in the extreme west of Brazil. It conducts research in the areas of forestry and sustainable livestock production, integrated systems and degraded areas, fruit crops, and agro-industrial native plants.

d) Mechanisms and processes

In the *Sustainable Development Goals: Brazil 2030 report*,

[...] which focused on a subset of 44 indicators, of those 44 with hard targets that align with forecast variables in International Futures, Brazil already has or is forecast to meet 19 indicators (43%) along the current path. For instance, the undernourished population is forecast to fall to 1.3%, under the target of 1.5% by 2030 (SDG 2). The under five mortality rate is forecasted to reach 9.6 per 1,000 by 2030, well below a target of 25 per 1,000 (SDG 3). Net primary enrolment and completion rates have already exceeded targets set by SDG 4. Primary education enrolment and completion rates, as well as targets related to gender parity in education, are forecasted to be met. Access rates for clean water (SDG 6) and electricity (SDG 7) are also forecast to be met. (Scott et al., 2017, p. 3).

For the next seven years, the report shows that

Brazil has made significant improvements in education, health, and infrastructure

over the past two decades and achieved many of the targets set out under the MDGs. Brazil's ability to meet SDG targets will happen in an increasingly complicated operating environment." Apart from financial and political factors, Brazil is facing "flagging productivity, an aging population, and dilapidated infrastructure [...] These factors will complicate Brazil's progress towards the SDGs and achievement of its SDGs targets will be shaped by policy choices. (Scott et al., 2017, p. 55).

e) Reforms – Current and future

Brazil signed the International Plant Protection Convention (IPPC) in 1951 and ratified it in 1961 (*Decree No. 51,342/1961*). Biosecurity Law No. 11,105/2005 governs the safety, monitoring, and cultivation of genetically modified crops, among other activities. It also created the National Technical Commission for Biosecurity (CTNBio) and the National Council of Biosecurity (CNBS), the authorities behind the National Policy on Biosecurity. In the past year, CTNBio granted 25 trade permits for different crops, according to its 2020 annual report. Although in recent years more permits have been granted for other products, such as gene therapies for the treatment of certain genetic diseases, and other items, crops (mostly soybean, cotton, and corn) still represent a great part of approved trade permits, that is, around 45% to 50% of all permits granted during that period.

In 2019, Brazil was ranked the second largest producer of biotech crops in the world, and the top developing country that planted biotech crops, planting 52.8 million hectares of biotech crops that year, covering 27.7% of the global biotech crop area and comprising 35.1 million hectares of biotech soybeans. This surpassed the US biotech soybean sector for the first time, according to the *International Service for the Acquisition of Agri-biotech Applications (ISAAA)*.

In 2018, CTNBio published Normative Resolution No. 16/2018, providing for the technical

requirements for application of an inquiry before CTNBio on Precision Breeding Innovation (PBI). The regulation aims to ensure that certain crops arising from PBI processes are not genetically modified crops (GMCs), so that manufacturers of PBI crops do not carry out any unnecessary administrative procedure applicable to GMCs only, and no GMC are allowed to adversely affect the environment. Brazilian current Biotechnology Development Policy (PBD) was enacted through Decree No. 6,041 of 8 February 2007. The PBD is focused on the promotion and performance of actions to establish an appropriate scenario for the development of innovative biotech products and procedures. The PBD prioritises four main sectors: human health, agriculture and cattle breeding, industry and environment. The main goal established in the PBD for the health sector is to stimulate the development and control of new technologies and the consequent production by the national industry of strategic products in the human health sector.

Decree No. 6,041 also created the National Committee of Biotechnology (CNB). The CNB has the responsibility of proposing and implementing mechanisms for monitoring and evaluating the programmes and activities established in the goals defined in the policy. Composed of members of several ministries, the CNB also includes representatives of the Brazilian Patent and Trademark Office (INPI), the Brazilian National Surveillance Agency (ANVISA), and research and financing institutions.

Law No. 11,326/2006 earmarks credit and funds to small-scale farmers, sustainability, enhanced technical and rural assistance, and research. It also outlines foresters, fishermen, certain Indigenous peoples and members of *quilombola* communities (former slave colonies) that are subject to the provisions of the statute. In relation to green finance, Brazil has enacted regulations that allow the expansion of financial mechanisms in the agri-business chain, for example Decree No. 10,828 of 1 October, 2021.

In addition, the National Monetary Council (CMN) Resolution No. 4,947/2021, which entered into force on 1 November 2021, provides for the issue of Agribusiness Receivables Certificates (CRA) with an exchange variation adjustment clause for investors residing in Brazil, subject to certain conditions regarding the class of CRA and the category of investor, as regulated by the Brazilian Securities Commission (CVM): any class of CRA can be issued in favour of professional investors, and only senior and subordinated mezzanine¹⁶⁰ classes can be issued in favour of qualified investors.

f) International commitments relevant to sustainable agriculture: UNFCCC (Paris Agreement)

Brazil confirmed its Nationally Determined Contribution (NDC) to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) on 27 October 2023 (Government of the Federative Republic of Brazil, 2023). In its document, Brazil acknowledges that the agriculture sector plays a key role in the Brazilian economy and its pursuit of sustainable development, especially that “[a]n increase in the global temperature interferes with the water levels and rainfall patterns in the different biomes, which, in turn, has the potential to harm the current levels of productivity and employment. Therefore, the Brazilian government considers

it to be of the utmost importance to implement adaptation actions in this sector to tackle the perverse effects of climate change” (Government of the Federative Republic of Brazil, 2023, p. 5). The NDC goes on to recognise that “[t]he need to plan for adaptation to the effects of climate change motivated Brazil to elaborate its National Adaptation Plan (NAP) in 2016, with the aim of promoting “the reduction and management of climate risks considering the effects of climate change, by taking full advantage of emerging opportunities, avoiding losses and damages, and building instruments to prepare natural, human, productive and infrastructure systems to adapt to climate change” (Government of the Federative Republic of Brazil, 2023, p. 6).

3. Conclusion

Despite contributing substantially to global food security, Brazil still faces enormous challenges to guarantee the sustainability of its agriculture systems, now required to focus on solutions to the environmental as well as the economic and social dimensions of sustainability. The UN Agenda 2030 and the SDGs point to the need for policies, science, and capacity building to conserve natural resources, including Brazil’s soils, water, forests, and biodiversity, and deal with the negative effects of global climate change on agricultural production, food, and environmental security.

¹⁶⁰ In Brazilian securitization structures, such as Agribusiness Receivables Certificates (CRA), ‘*subordinada*’ refers to a subordinated class of securities that ranks below the senior class in payment priority and therefore bears higher risk. Within this category, CVM Resolution No. 60/2021, Annex II (CRA), Art. 19, § 1 allows the creation of subclasses with different subordination levels: *subordinada júnior* (junior subordinated) and *subordinada mezanino* (mezzanine subordinated). The mezzanine tranche thus occupies an **intermediate** position—subordinate to senior investors but senior to junior holders. In market language, as explained by financial analysts (Boldrini, Broadcast/Investalk, Banco do Brasil, October 2024), the **senior**, **mezzanine**, and **subordinated levels** define investors’ order of payment and relative risk–return exposure.

Case study 2 Germany

by Ian Hannam

1. Introduction

More than half of Germany's surface area are used for agriculture, which is the largest land user in the country and a significant contributor to environmental stress. But in recent years agricultural areas have declined. One reason for this is the increase in land use for settlements and transport infrastructure, a development with negative consequences for nature and the environment (UBA, 2018). Practices using organic and natural inputs have been found to be beneficial for Germany. Adaptation of these practices is viewed as an opportunity for increasing sustainable agriculture in Germany.

Promoting and increasing the uptake of sustainable agriculture practices is an ongoing challenge for European agricultural policy in general. Since the turn of the millennium, the EU Common Agricultural Policy (CAP) has striven not only to support agricultural production but also to incorporate nature and environmental protection, by setting up multiannual incentive schemes designed to increase the adoption of agri-environmental practices. These measures compensate farmers for undertaking voluntary environmental measures. In addition to being incorporated within the CAP, numerous agri-environmental practices are also included in other guidelines, strategies, directives, and regulations such as the EU Eco-Regulation and [Germany's National Sustainable Development Strategy](#). In promoting the adoption of sustainable agri-environmental practices, Germany is highlighting an important task for agricultural policy, which is to ascertain those practices farmers can adopt to improve the environmental quality of agro-ecosystems. Currently, agri-environmental policy is often a result of political compromises rather than evidence-based investigations. Identifying sustainable agricultural practices involves considering numerous social, ecological, and environmental criteria, and there is currently a

lack of knowledge regarding the overall impact of specific practices (Baaken, 2022).

a) Livelihoods dependent on agriculture

The [number of agricultural businesses](#) in Germany has declined since the 1970s. If there were around 904,700 businesses in 1975, in 2020 this figure has fallen to 256,900. On the one hand, farmers have to contend with agricultural legislation and various issues to keep their businesses alive. On the other hand, industrial and technological advancements have allowed for work which required high amounts of labour in previous decades to be completed with less human interaction. [Employee numbers](#) have been decreasing in recent years, with 582,000 recorded in 2020, compared to 661,000 10 years ago. The leading [expectations](#) of the population from agricultural businesses were animal husbandry appropriate to the species and fair pay for employees.

In 2023, 1.2% of employees in Germany were working in agriculture, forestry, and fishery (primary sector). This confirmed a significant structural change in the national economy. In 1950, for example, almost 25% worked in the agriculture sector (World Bank, n.d.b).

In the field of organic farming, German agriculture is making progress which becomes ever more relevant in the context of global climate change and ongoing environmental concerns. Organic farming aims to use sustainable methods, relying on non-chemical, natural fertilisers and pesticides. These come from animal and plant waste. The challenges include higher product prices for consumers and therefore lower yields for producers. In 2023, there were 36,680 [organic businesses](#) in the country. That same year, 11.4% of agricultural land in Germany was used for organic farming (BMLEH, 2025).

b) Percentage of rural families

The rural population in Germany was reported at 22.35% in 2022 (World Bank, n.d.c).

c) Inhabitants

'Germans' (or Deutsche) are the natives or inhabitants of Germany and sometimes more broadly, any people who are of German descent or native speakers of the German language. The Constitution of Germany defines a German as a German citizen.

d) Environmental impacts from agriculture

Agricultural intensification in Germany has led to a widespread decline in arthropod biomass and the abundance and number of species, as well as the degradation of soils and the pollution of water bodies (Baaken, 2022). Mechanised tilling and harvesting, as well as fertilisers and pesticides, have an impact on soil, water, air, and on the plants and animals that inhabit farm areas. Intensive farming aimed at increased yields leaves behind denuded farmland, while the use of heavy machinery and intensive tilling can compact the soil and increase the likelihood of soil fertility loss and water and wind erosion. Groundwater contamination by nitrates and the eutrophication of Germany's rivers, lakes, and oceans are mainly attributable to extensive use of nitrogen-rich fertilisers.

Pesticides and fertilisers containing heavy metals, as well as pharmaceutical contaminants and residues from animal breeding, pose an additional threat to terrestrial and aquatic ecosystems. Further environmental repercussions include biodiversity loss, as well as the greenhouse gases (GHG) released by changes in land use, particularly converting grassland to arable land, fen/mire use and forest clearing, fertiliser use, tilling, and livestock farming. In 2016, Germany's farm sector accounted for 7.3% of its GHG emissions, not counting changes in land use or emissions from the production of mineral fertilisers. This sector, in conjunction

with the industrial sector, is Germany's second largest polluter, behind the energy sector (83.5%) (UBA, 2019).

e) Agriculture incidence on GDP

Data for Germany from 1991 to 2021 show the average GDP value added by agriculture in Germany was 0.88%, with a minimum of 0.7% in 2015 and a maximum of 1.1% in 1991. The latest value from 2024 is 0.8% (World Bank, n.d.b). GDP from agriculture in Germany decreased to EUR 6.66 billion in the second quarter of 2025, from EUR 7.73 billion in the third quarter of 2022 (Trading Economics, n.d.).

f) FAO, UNEP, IUCN metrics on sustainable agriculture

Germany collaborates with FAO to support a wide range of programmes, spanning normative work, development cooperation, emergency response, and resilience building, making it vital in FAO's drive to achieve its sustainable agriculture objective. Germany remains an important partner for FAO, advocating for the right to food and responsible investment in agriculture in major international fora like the G7 and G20 summits. The year 2017 marked 15 years of successful collaboration between FAO and Germany through the Bilateral Trust Fund (BTF), where more than US\$ 134 million have been channelled since 2002, enabling FAO to deliver tangible results at the global, regional, and country levels. Providing farmers with the capacity to process and add value to the food they produce enables the partnership between Germany and FAO to cut food waste, connect small-scale rural producers to city markets, and build the capacity of governments to shift nutrition behaviour at home. Germany has been a crucial partner in FAO's efforts to assist crisis-hit and vulnerable communities to become food and nutrition secure (FAO, 2019b).

On 24 September 2019, UNEP and German Ministry for the Environment launched the *Global Opportunities for SDGs (GO for SDGs)* initiative at the SDG Summit aiming to accelerate green

economy solutions globally. *GO for SDGs* will share success stories and disseminate tools and instruments with a positive track record to support a total turn-around of our lifestyles, production patterns, and approaches towards policymaking for an inclusive green economy. To ensure that an accelerated green transition is just and inclusive, *GO for SDGs* will collaborate closely with international labour unions towards the creation of better paid jobs and safe and healthy work environments (UNEP, 2019b).

IUCN and Germany have a long history of tight close collaboration. The German government has been an IUCN State Member since 1958 and has provided significant support for IUCN's work on issues including protected areas. In 2017, the German government officially recognised IUCN as an intergovernmental organisation, reaffirming the Union's important role on the global environmental and development stage. This decision recognises the official functions IUCN carries out on behalf of its Member States and affords the Union a range of rights and benefits (IUCN, 2017a).

2. Governance framework enabling sustainable agriculture (land management)

a) Legislation

The German federal government promotes the importance of transparency in the market, the evaluation and improvement of standards in the global market, and on food and feed safety. The federal government of 16 states apply the EU Common Agricultural Policy (CAP) as set out in EU *Regulations Nos. 1303, 1305, 1306, 1307, and 1308/2013* to German agriculture. Federal legislation and policy also promote foreign investments in agriculture. In Germany, the use of the environment by agriculture and the influence agriculture has on the environment are regulated by a number of central environmental laws, such as the Federal Nature Conservation Act, Federal Soil Protection Act, Federal Water Act, and Federal Emission Control Act. German policy is to apply the precautionary principle

which allows policymakers to justify certain decisions even when scientific evidence is not available. It operates alongside the need to combat global hunger, which is one of Germany's international developmental aims.

The CAP practices aimed at German farmers are based on regionally adapted catalogues, which farmers feel are not flexible enough in terms of local conditions and are sometimes perceived as incompatible with good professional practice (Wittstock et al., 2022). Most CAP measures are 'action-based' payments, meaning that farmers receive a uniform payment for adopting a specific agri-environmental practice, rather than result-based schemes, implying that the effects of measures are not monitored. Identifying sustainable agricultural practices involves considering numerous social, ecological, and environmental criteria, and there is currently a lack of knowledge regarding the overall impacts of specific practices. Moreover, the evidence pointing to environmentally beneficial practices is scattered among numerous sources (Baaken, 2022).

The German Civil Code (*Bürgerliches Gesetzbuch*) (BMJV & BfJ, 2021) enables a farmer to choose between three general forms of acquiring and using agricultural land:

- Plough-change (*Pflugtausch*), which gives the possibility of ploughing the land of another farmer. No other right, such as the European or national subsidy, is transferred with it, unlike with a lease;
- A normal contract of leasing the land; and
- Ownership is transferred with all rights by a sales contract.

Government authorities can expropriate the land when sustainable development is needed, but when there is also a need to generate money from the land. This means the government must stay in tune with market conditions to keep the land operating commercially and also ensure its proper sustainable use. The factors

the government must take into account when considering the commerciality and sustainability of land include (Winter, 2016).

- Rural ground development;
- Environmental protection;
- The financial and economic development of farmers;
- The maintenance and protection of natural, cultural, and historical monuments.

The national food safety law is based on EU law. All national legal proposals and EU proposals are notified to the WTO and are normally in line with Codex Alimentarius standards. The European Commission has the mandate to negotiate for all EU member states in Codex Alimentarius meetings (EC, n.d.a). The following laws regulate food safety in Germany, which has a 'total quality management system' (TQM system):

- Regulation (EC) 178/2002 sets the general principles and requirements of food law, establishing the European Food Safety Authority and determines the procedures in matters of food safety; last amended by *Regulation (EU) 652/2014* defining the provisions for the management of expenditure relating to the food chain, animal health, and animal welfare, as well as relating to plant health and plant reproductive material.
- The national German Food and Feed Law (*Lebensmittel und Futtermittelgesetzbuch*) (LFGB) of 3 June 2013, BGBl. I p. 1426.

The duties of the quality management system remain the responsibility of the food manufacturers and traders. The TQM system includes:

- Administrative systems and structures;
- Technical standards of hygiene;

- Accountability;
- Research standards;
- Standards in decisive product labelling;
- Structures for responsibility in a factory or trade firm. The directors' and officers' liability is based on the precisely managed delegation of responsibility;
- International Featured Standards (IFS), or the German DIN ISO 9001 and 9004, which deal with international contents of food quality requirements.

A risk management system called Hazard Analysis Critical Control Points (HACCP) was introduced worldwide by FAO for the production, distribution, and consumption of food (FAO & WHO, 2001). This risk management system is a minimum standard for all German firms who handle food in any manner (Regulation (EC) 852/2004 on the hygiene of foodstuffs (OJ L 139, 30.4.2004, p. 1), last amended by Regulation (EC) 219/2009 (OJ L 87 109 31.3.2009)).

b) Policies

Sustainability policy in Germany is closely intertwined with European and international policy and is now oriented towards the SDGs. In Germany, the topic of sustainability is assigned to the responsibilities of the Chancellery. The State Secretaries' Committee for Sustainable Development meets at regular intervals under the aegis of the Head of the Federal Chancellery. Since 2004 the Bundestag has also convened the Parliamentary Advisory Council on Sustainable Development. This cross-party body sees itself as a 'watchdog' for sustainability policy in the parliament and assesses planned legislation for compatibility with goals of [Germany's National Sustainable Development Strategy](#) (GSDS).

The GSDS emphasises that a broad societal consensus on the SDGs is a precondition for achieving them. The Commission on Growth, Structural Change and Employment recognises

that stakeholders play an important role in Germany's efforts to find sustainable answers to structural change questions. The country experienced several barriers to action on the SDGs with an environmental dimension, including the challenge of ensuring policy coherence which requires the coordinated deployment of all policy instruments to advance the SDGs. Furthermore, cooperation between the federal government and the Länder (states) is challenging. The German Länder play a crucial role in SDG action as they have legislative and administrative powers in vital areas of sustainable development (EEA, 2020).

The 2021 Sustainable Development Report indicates that while significant challenges still remain in relation to addressing poverty (SDG 1), achieving zero hunger (SDG 2), life on land (SDG 15), and climate action (SDG 13), the situation for all four indicators is moderately improving. Several other SDGs (7– 9 and 16– 17) are likewise on track (Sachs et al., 2021).

c) Institutions

The supports and advises organs, state institutions, and society in the implementation of sustainable and balance-oriented action on legislative, planning, and decision-making processes, by providing expertise, identifying potential for optimisation and by submissions, publications, and organising its own events. It has a number of roles, including to integrate the concept of sustainability into legislative and planning processes, support, and advise the public, policymakers, economists, and management, increase awareness of the connections between human activity and its impact on natural processes in the sense of balance-oriented human-nature interaction, and ensure sustainable action in social, environmental, economic, and participatory ways in all areas of society. [German Federal Association for Sustainability](#) supports and advises organs, state institutions, and society in the implementation of sustainable and balance-oriented action on legislative, planning, and decision-making processes, by providing

expertise, identifying potential for optimisation and by submissions, publications, and organising its own events. It has a number of roles, including to integrate the concept of sustainability into legislative and planning processes, support, and advise the public, policymakers, economists, and management, increase awareness of the connections between human activity and its impact on natural processes in the sense of balance-oriented human-nature interaction, and ensure sustainable action in social, environmental, economic, and participatory ways in all areas of society.

The [German Council for Sustainable Development](#) advises the Federal Government on issues of sustainability policy. It acts in this capacity as an independent entity. The main tasks of the Council include generating contributions to the German Sustainable Development Strategy, specifying concrete areas of action and projects, and making sustainability a public issue of vital importance.

The [U.S.-German Forum Future Agriculture](#), initiated by the [Aspen Institute Germany](#) in cooperation with the University of Illinois Urbana-Champaign, aims to promote transatlantic dialogue on common challenges for the field of agriculture and rural regions and pave the way for a more sustainable agricultural future. Through an exchange of experience, the opportunity to visit best on-site practices and the formation of new transatlantic networks, this project promotes innovative solutions for a sustainable rural and agricultural future and strengthen transatlantic relations.

d) Mechanisms and processes

Promoting and increasing the uptake of sustainable agri-environmental practices is an urgent challenge for Germany and European agricultural policy in general. Since the turn of the millennium, the CAP has striven not only to support agricultural production but also to incorporate nature and environmental protection by setting up multi-annual incentive schemes designed to increase the adoption of

agri-environmental practices. These measures compensate farmers for voluntary environmental commitments. In addition to being incorporated within the CAP, numerous agri-environmental practices are also included in other guidelines, strategies, directives, and regulations, including the EU Eco-Regulation and Germany's National Sustainable Development Strategy (Baaken, 2022).

Moreover, organic farming has established itself as a key pillar of traditional and German agriculture and food industries. It is a system of food production that contributes to the conservation of natural resources and applies high production standards. In Germany, “organic farming aims to: achieve as closed a nutrient cycle on the farm as possible (the aim is for the farm to produce its own feed and nutrients); preserve and enhance soil fertility; and place emphasis on animal welfare in animal husbandry” (BMEL, 2022, p. 4). The target of 20% of agricultural land in Germany to be organically farmed by 2030 is part of the Federal Sustainability Strategy. The coalition agreement also envisages advances in the digitalisation of agriculture, for example, to reduce the use of pesticides and fertilisers on fields and drugs in livestock farming. According to BÖLW (Organic Food Production Alliance), there are some 30,000 organic farms, roughly one tenth of all agricultural enterprises. To achieve the government target, a further 30,000 to 40,000 farmers would have to change over to organic farming.

The Federal Ministry of Food and Agriculture (BMEL) initiated the development of a Strategy for the Future of Organic Farming in 2015. The strategy is intended to help address resource policy challenges in agriculture and identify additional development prospects for farm operators in Germany. These areas of action are based on the key question of what policymakers can do at the national level to expand the amount of land used for organic farming. “The principal focus is on creating an appropriate policy framework for the relevant economic operators. In addition, it provides insight into the ease of movement between organic and conventional

methods of production, progressing from coexistence to interaction” (BMEL, 2022, p. 9).

The EU legal framework lays down the precise production and manufacturing requirements for agricultural produce and foods labelled as organic products. Stringent production standards prescribed by organic farming must be complied with. The control system accompanying the entire production process and trade is based on risk. The legislation ties in with the basic guidelines of the [International Federation of Organic Agriculture Movements](#) (IFOAM). Since 1 January 2022, *Regulation (EU) 2018/848* of the European Parliament and of the Council of 30 May 2018 is the application of the legislative act (known as the Basic Act). They lay down the rules on organic production and labelling of organic products, thus repealing and replacing Council *Regulation (EC) No 834/2007* of 28 June 2007. The new regulation provides for transitional periods for the implementation of certain new provisions, in particular on trade. It is based on *Regulation (EU) 2018/848* that the Commission adopted further detailed secondary legal acts. Secondary acts concerning organic farming covers three main areas: production and labelling, controls, and trade (EC, n.d.b & n.d.c).

The EU rules contain the following key points:

- “Plant production - Conversion regulations for farms with plant production, Preserving and increasing soil fertility through special soil tillage and multiannual crop rotations, Supplementary fertilisers and pesticides only if they are stated in specific positive lists, General use of organically propagated seed and planting stock, Requirements for organic wine have been included in the new EU Basic Regulation.
- “Animal husbandry - Conversion provisions for farms and for animals of non-organic origin, Stock farming is a land-related activity, A general ban on keeping livestock tethered, Livestock must be fed with organically produced feed, Animals are kept healthy mainly by encouraging their natural

immunological defence, Regular controls and certification of origin for organically-produced meat” (BMEL, 2022, p. 9).

e) Reforms – current and future

New **Common Agricultural Policy: 2023–27.**

The new common agricultural policy is critical to securing the future of agriculture and forestry, as well as achieving the objectives of the European Green Deal (EC, n.d.d). On 2 December 2021, the agreement on reform of the common agricultural policy (CAP) was formally adopted. The new legislation, which began in 2023, paves the way for a fairer, greener, and more performance-based CAP. It seeks to ensure a sustainable future for European farmers, provide more targeted support to smaller farms, and allow greater flexibility for EU countries to adapt measures to local conditions. Agriculture and rural areas are central to the European Green Deal, and the new CAP will be a key tool in reaching the ambitions of the **Farm to Fork** (F2F) and biodiversity strategies. For the period 2023–2027, the CAP will be built around 10 key objectives. Focused on social, environmental, and economic goals, these objectives will be the basis upon which EU countries design their CAP strategic plans. The objectives are (EC, n.d.e):

- to ensure a fair income for farmers;
- to increase competitiveness;
- to improve the position of farmers in the food chain;
- climate change action;
- environmental care;
- to preserve landscapes and biodiversity;
- to support generational renewal;
- vibrant rural areas;
- to protect food and health quality;
- fostering knowledge and innovation.

The European Green Deal prioritises green technologies and nature conservation. The objective is to sever the link between economic growth and the use of resources, while at the same time creating new jobs. The numerous initiatives in the framework of the project also give companies the requisite security in their

planning and lay the foundations for a more crisis-resilient EU. Among the European Green Deal targets is no net emissions of GHG by 2050. As part of its US\$ 145 billion recovery budget, the German government has allocated some US\$ 46 billion to sustainable investments in areas like renewable power and electric vehicles. This is a target that Germany has also set for itself by the same date. To pave the way, the EU plans to implement a legally binding European climate protection law to send out a strong signal to the EU's partners and to its own Member States (Facts about Germany, n.d.).

Since 95% of EU food is directly or indirectly produced from the soil, the concretisation of the European Green Deal with regard to agriculture through the F2F strategy is relevant for achieving the goals of the whole concept. This strategy promotes a transition towards fair, healthy, and environmentally-friendly European food systems and is at the heart of the European Green Deal as regards soil protection, by targeting, more specifically, food insecurity, climate resilience, biodiversity, and environmental protection in general (Heuser & Itey, 2022). The EU soil strategy for 2030 sets out the framework and measures to protect and restore soil, and ensure that it is used sustainably. It sets a vision and objectives to achieve healthy soils by 2050, with concrete actions by 2030 (EC, n.d.f).

Soil Health Law. In 2023, a European Soil Health Law was proposed by the European Commission. The aim is to ensure consistency in approach and a high level of soil environmental and health protection. A new binding European legislative framework on soils is needed, to address soil threats and degradation in a comprehensive way. With this approach, the EU will be able to tackle the causes of soil degradation, like poor land management, climate change, unsustainable farming, land sealing, and pollution (Pieper et al., 2023, p. 4).

The recommendations that have been made in relation to an EU Soil Health Law are notably expansive (Pieper et al., 2023, p. 5). To reach the goals of healthy soil by 2050, it is proposed that

the Soil Health Law request Member States to take immediate action against the most urgent soil degradation issues, such as soil carbon losses, pollution, soil sealing, and land take. The law will provide common definitions of soil health and define environmental quality standards for the physical, chemical, and biological status of soils and establish workable indicators for soil health, in particular for soil carbon, soil biodiversity, and soil pollution. It will link soil monitoring to the prospective environmental risk assessment and management.

It is further proposed that the Soil Health Law should define sustainable soil management practices for different land uses, soil types, and pedo-climatic conditions, and apply the non-deterioration and precautionary principles as key concepts, as well as establish a monitoring programme for soil health and land take at EU level. Most especially, it is proposed that the law should address equally diffused soil pollution in all land use types in addition to contaminated sites management. The new Soil Health Law should provide a clear definition of the term land take, distinguish between land take and soil sealing, and standardise land take monitoring across the EU.

f) International commitments relevant to sustainable agriculture

UNFCCC (Paris Agreement). The submission by Germany and the European Commission on behalf of the European Union and its Member States of 17 December 2020, for the timeframe 2021–2030, provides for agriculture under the Land Use, Land Use Change and Forestry (LULUCF) sector (Germany & EC, 2020, p. 9). The submission specifies that the EU's LULUCF policy framework builds on IPCC guidance, the principles of transparency, accuracy, completeness, comparability and consistency (TACCC), and existing accounting rules, updating, and improving them for the period from 2021 to 2030. "The policy framework identifies net accounted emissions and removals, contributing to the aim of enhancing the EU's net land sinks in the long-term" (Germany & EC, 2020, p. 15).

It goes on to outline that "Managed Grassland, Managed Cropland and Managed Wetland use as baseline the average emissions between 2005 and 2009 (net-net accounting). Managed Forest Land uses as baseline a Forest Reference Level based on continuation of Forest Management Practices between 2000 and 2009 and taking into account the age-class structure of forests, projected through the compliance period. "The mere presence of carbon stocks is excluded from accounting" (Germany & EC, 2020, p. 19).

UNCCD (LDN Targets). To initiate discussions on options for implementing SDG 5.3 on Land Degradation Neutrality (LDN) in Germany and at EU level, the German Environment Agency commissioned the research project called Implementing SDG Target 15.3 on Land Degradation Neutrality: Development of an Indicator Based on Land Use Changes and Soil Values (2015–2017). The project assessed land and soil degradation and its drivers within Germany and the EU, and derived suggestions of necessary steps and guiding questions towards the implementation of LDN at the national level. The project provided an inventory of existing monitoring schemes and policy processes for Germany and Europe and derived starting conditions and policy recommendations for initiating the LDN implementation at EU level. A variety of German development cooperation projects support partners in developing, implementing and improving policies, as well as enabling environments to combat desertification, land degradation, and drought. This includes diverse measures related to strengthen land tenure rights as well as promoting integrated land use planning (UNCCD, 2023a, pp. 37–40).

3. Conclusion

An important task for agricultural policy in Germany and beyond is to understand which practices farmers can adopt to improve the environmental quality of agroecosystems. However, it has been assessed that current agri-environmental policy is often a result of political compromises rather than evidence-

based investigations. In Germany, identifying sustainable agricultural practices involves considering the numerous social, ecological, and environmental criteria. However, there is

currently a lack of knowledge of the “overall impacts of specific practices” (Baaken, 2022, p.38).

Case study 3 Kyrgyzstan

by Ian Hannam

1. Introduction

The Kyrgyz Republic is a landlocked, mountainous country with a territory of 199,000 km². Two-thirds of its multi-ethnic population live in the rural area. With much of their communities being rural, Kyrgyzstan is reliant on their agricultural products for sustenance and income with around 40% of labourers employed in agriculture. Poverty increased from 20% in 2019 to 33% in 2021, with an additional 10% at risk. This highlights the need for nutrition-based agriculture and social protection to the rising needs of the country. The global food crisis has exacerbated existing stresses following the recovery from the COVID-19 pandemic, which had already eroded the resilience of the most vulnerable households. In October 2022, inflation remained high in Kyrgyzstan at 15.4%, compared with October 2021, one of the highest in Central Asia. According to the World Food Programme (WFP) food security assessment in November 2022, 17% of households, or more than 1.1 million people, are food insecure and around a fifth of do not have an adequate diet (WFP, 2022b).

a) Livelihoods dependent on agriculture

Agriculture is the backbone of the Kyrgyz Republic's rural economy. It employs about 40% of the country's labour force and accounts for 7% of the GDP. Unfortunately, the sector has been slow to modernise since the end of communism and growth has been insufficient to reduce poverty and food insecurity in rural areas (ITA, 2024).

b) Percentage of rural families

In 2024, the permanent population of the republic reached 6.8 million people with a rural population of 65%, which is mainly engaged in agriculture. Price growth creates an additional difficulty to the socio-economic situation for vulnerable segments of the population.

Nowadays, about 25% of the population live below the national poverty line, of which 74% is rural population (National Statistical Committee of the Kyrgyz Republic, 2022).

The WFP estimates that 16% of the poorest quintile of Kyrgyz households have poor food consumption. Some regions even exhibit poor or worse food consumption scores for as much as a quarter of all households. Nutrition indicators are likewise a cause for concern. The rate of stunting among children, especially in the south of the country, which is predominantly rural, is over 20% (UNICEF, n. d.).

c) Inhabitants

Both the agricultural practices and the amount of agricultural production needed for the population make sustainable agriculture in Kyrgyzstan a growing and serious issue. Due to the rural extent of the country, farmers tend to have access only to the most basic tools, and often lack the knowledge of proper farming methods, meaning that the limited land available for farming is being seriously degraded. The herding of livestock has had a similar effect on the land in the form of desertification in already overgrazed pastures. However, the lack of farmable land and resilient pastures is not the only issue affecting the ability for sustainable agriculture in Kyrgyzstan.

In the mountain areas, the harsh climatic conditions and limited range of crop production mean that the local population can only grow hearty, starchy crops to survive, and as a result, many are suffering from nutritional deficiencies. Income of the mountain occupants is on average two times lower than that of the inhabitants of the lowland areas. Food products are mostly imported and are 30% more expensive than locally produced food (Aidaraliev, 2020, p. 26). Nutritional deficiencies can also be attributed to rural inhabitants for



simply not being able to afford food, as many have low incomes, compared to the cost of food produced in Kyrgyzstan to that of imported food. Agriculture in the country is very sensitive to rainfall and availability of irrigation water, and warmer temperatures are linked to higher crop production. Accordingly, climate change poses an additional and significant risk to long term food security (WFP, 2014, p. 7).

d) Indigenous/local communities

Kyrgyzstan is a multinational country and according to the National Statistical Committee, by 2022, over a quarter (25.9%) of the country's inhabitants were members of minority ethnic groups. Ethnic Uzbeks make up the most sizeable minority and primarily live in the southern regions of Osh and Jalalabad. The second largest ethnic minority is Russians, primarily in the capital Bishkek, and the surrounding area in the northern region.

Ethnic Kyrgyz now make up almost three quarters (74.1%) of the population. Slavs, mainly Russians but also some Ukrainians, were until recently the largest minority in Kyrgyzstan. Unlike in other Central Asian states, a significant proportion of Slavs are rural dwellers. Their numbers have, however, decreased rather dramatically since independence. According to 2021 statistical data, minority groups include: 14.8% Uzbeks (999,300); 5% Russians (335,200); 1.1% Dungans (76,600); 0.9% Uyghurs (61,000); as well as groups of Tatars, Kazakhs, Ukrainians, Germans, Tajiks, Koreans, and Jews, which altogether make up 4.1% of the population (National Statistical Committee of the Kyrgyz Republic, 2022a).

e) Environmental impacts from agriculture

In the last few decades, the ecological aspects of land management, such as soil degradation and overgrazing of pastures that lead to their desertification, have become a central issue in Kyrgyzstan. State authorities, and many other studies and reports from foreign organisations, state that land degradation is high. The problem

is associated with diverse factors, such as loss of vegetative cover and depletion of soil from overgrazing and non-rotation of crops, soil salinisation, wind and water erosion, as well as the necessity to improve the legal framework. In this regard, the State policy on the agrarian sector, particularly legislation for sustainable land management, has been a priority of the government (Anarbaev, 2018).

f) Agriculture incidence on GDP

Traditionally, agriculture is the primary source of livelihood in rural Kyrgyzstan. Moreover, agriculture provides the largest share of employment and contributed around 15% of the republic's GDP in 2021 (National Statistical Committee of the Kyrgyz Republic, 2022b). The available arable land is around 1.23 million hectares, which means that only 6% of the total territory of the republic is used for crop production. Nevertheless, despite the limited amount of arable land, crop cultivation contributes to national food security, although it is mostly oriented towards cereals. For instance, in 2021, a significant part of the arable land, around 581,000 hectares (47.4%), was sown with grain crops, such as wheat, barley, and corn grains, 384,000 hectares (31.3%) with fodder crops, 75,000 hectares (6.1%) with potatoes, and 54,000 hectares (4.4%) with vegetable crops. The remaining area was used for grain legumes, rice, and buckwheat (National Statistical Committee of the Kyrgyz Republic, 2022).

Labour migration is important for the economy, but it affects agriculture and poverty. Nowadays, the remittance from migrants plays an essential role and income source for many rural households. The Kyrgyz economy depends on a high rate of remittances from abroad, which comprised 31% of the GDP in 2021. Remittances are an important contributor to improving nutrition and reducing the national poverty rate. Without remittances, poverty would have reached 43% and extreme poverty would have reached 17% in 2021 (WFP, 2022a). The country's high dependency on imported basic foods continues to negatively affect the

most vulnerable households for which food makes up 65% of their expenses.

g) FAO, UNEP, IUCN metrics on Sustainable Agriculture

Over the years, through FAO, Kyrgyzstan has made advances in the implementation of national strategies and programmes for sustainable development and food security. Assistance has mainly focused on enhancing capacities to assess, plan, and implement action for achieving sustainable food and improving nutrition. Specific attention is given to strengthening institutional capacities and legal frameworks for sustainable agriculture and inclusive value chains. Other priority areas include improving resilience to climate change and reducing rural poverty through capacity building and small and medium-enterprise development, targeting rural women in particular (FAO, n.d.).

FAO's support to Kyrgyzstan occurs through synergies with partner agencies and stakeholders. In close partnership with the government, UNICEF, WFP, and non-government partners, FAO has developed the National Food Security and Nutrition Program, which now serves as a basis for fulfilling people's rights to food, nutrition, and development (WFP, 2022d, p. 1). In the last quarter of 2022, WFP completed 125 community development projects. These entail restoration and construction of 96 km of drinking water pipelines, as well as enabling access to clean drinking water for 29 rural communities. Around 45 km of irrigational canals improved irrigation and agricultural productivity, and reduced water loss in 22 villages. Furthermore, rural communities have constructed 163 community facilities (dams, animal treatment basin, bridges, etc.), reinforced 1,947 km of riverbank with cement and gabion-nets, restored 550 km of drainage canals, and planted over 3,600 trees to mitigate the risks of natural disasters. Additionally, WFP has provided cash assistance to 18,040 people (3,608 families) as part of WFP's support to COVID-19 affected populations across 23 urban locations (WFP, 2022a).

FAO is also actively engaged in the Working Group on Social Protection Assessment Based National Dialogue chaired by the government and the ILO, and provides expertise on linking social protection with agriculture (ILO, 2015).

2. Governance framework enabling sustainable agriculture (land management)

a) Legislation

Since its independence, the Kyrgyz government has undertaken a number of legislative initiatives aimed at improving the agricultural sector. Of significance are the amendments to the Kyrgyz Constitution by referendum on 17 October 1998, which guaranteed the introduction of private land ownership. This resulted in the adoption of the Land Code (1999), which abolished the State monopoly on land and introduced private ownership rights to agricultural land, except pastures which remained in State ownership. In the same year, the government adopted several other pieces of legislation, such as the Law of the Kyrgyz Republic *About Preservation of the Environment* (1999), the Forest Code (1999), and the *About Peasant Farms Law* (1999). Later, the *About Management of Agricultural Lands Law* (2000), the *About Management of Agricultural Lands Law* (2001), the *About Mountain Regions Law* (2002), the Water Code (2004), the *About Cooperatives Law* (2004), and the *About Development of Agriculture Law* (2009) (Anarbaev, 2022).

This framework of legislation is aimed at creating conditions for private ownership rights to land and creating stability of agricultural markets and land management and sustainable agriculture. During the period 1991–1998, the government implemented a wide-ranging privatisation programme of State-owned properties, in three phases. A dominant proportion of State-owned plants, factories, buildings, and other domestic service-providing enterprises were privatised. Privatisation in the agricultural sector was launched as well, where the agricultural land and assets of State and collective farms,

including agricultural equipment, machinery, and livestock, were distributed among former farmworkers and other villagers, including teachers, civil servants, doctors, and others working within the territory of the *kolkhozes* or *sovkhozes* (Anarbaev, 2018, p. 67).

The adoption of the Land Code (1999) facilitated and accelerated the allocation of property rights and registration and by the end of 1999, the government had issued around 511,000 land certificates. The privatisation of arable land has caused a number of other issues. The 470 *sovkhozes* and *kolkhozes* established in Soviet times were finally dissolved by 1996, and nowadays there are 401,350 individual farming entities in agriculture. The arable land was parcelled out to small units, which has resulted in a small-scale farming system functioning under a market-based economy. This has resulted in an average arable landholding of 2.98 hectares, but in the southern part of the Republic, due to the higher density of population, the average arable landholding is less than one hectare. This situation has made it difficult for landowners to implement ameliorative activities, including land rotation and preservation of soil fertility. As these lands are privately owned and managed, State authorities have limited direct influence over land use activity. Consequently, legal and financial mechanisms were considered as the best approach to regulate this situation (Anarbaev, 2018, p. 68).

b) Policies

The difficult socio-economic situation faced after the dissolution of the Soviet Union forced Kyrgyzstan to implement a number of radical reforms. During 1991–1998, the Kyrgyz government implemented a wide-ranging privatisation programme of State-owned properties (Anarbaev, 2018, p. 67). The land reform programme created a class of landowners in Kyrgyzstan. However, the average size of arable land landholdings has decreased and is only 2.7 hectares in comparison to the beginning of 2000s, and this includes 1.9 hectares of irrigated arable land. Accordingly, the small-plot farming

leads to the small-scale of production and is a significant limitation to achieving efficient agricultural production, sustainable land management and to increasing the productivity of labour. The area of degraded agricultural land has increased, and intensive salinisation and waterlogging of irrigated lands have occurred (National Council for Sustainable Development of the Kyrgyz Republic, 2013).

With the aim of better land management, the authorities have promoted and facilitated the organisation of small-plot farming practicing farmers into agricultural cooperatives to create larger landholdings for joint agricultural farming. In 2002, the government adopted the State Program for Supporting of Agricultural Cooperative Movements in the Kyrgyz Republic. However, in practice, this programme does not work very well as an economic incentive and regulatory framework for the improvement of land relations. In this regard, the ecological condition of many agricultural lands is poor (Anarbaev, 2018, p. 69).

The adoption of the Law ‘About Development of Agriculture’ (2009) established the legal framework to implement the State socio-economic policy for the development of agriculture and the production of agricultural products, to provide the population with food, industry with raw materials, and contribute to the sustainable development of the country.

In 2013, the government adopted the National Strategy for Sustainable Development for 2013–2017, with a special part of the strategy devoted to agricultural issues. The document highlights that the country must achieve food security, but also regain the status of a major supplier of ecologically clean agricultural foods and processing industry products for the foreign market, in accordance with international standards and requirements (National Council for Sustainable Development of the Kyrgyz Republic, 2013).

Taking into account that Kyrgyzstan has limited arable land in comparison to neighbouring

Central Asian countries, to be competitive in the market of food products in the region, it aims to focus on quality, instead of quantity. As a result, the Kyrgyz government has made it a priority to promote organic farming and in 2019, the *About Organic Agricultural Production in the Kyrgyz Republic* Law was introduced. This law establishes the legal framework to produce organic agricultural products and their certification, as well as regulate relations between certification bodies and producers of organic agricultural products. The law also provides a better explanation and definition of 'organic farming', in lieu of 'ecologically clean agricultural foods' which was previously used.

c) Institutions

The Ministry of Agriculture is responsible for state policy in the agro-industrial field, including animal husbandry, veterinary services, fish farming, crop production, plant quarantine, land reclamation, land resources, water resources for irrigation and production, irrigation and reclamation infrastructure, the food processing industry, and the food industry and pasture regulation.

After its independence in 1991, Kyrgyzstan quickly made changes in its governance system. Before, it was subjected to the Soviet system where nature conservation, forestry, use of pastures, and land management were under the Ministry of Agriculture of the Kyrgyz SSR. Since independence, driven by the development and popularity of ecological science, a special state body was established, which nowadays exists in the form of the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic. Since 2021, the Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic was reorganised as the Ministry of Agriculture. The Forestry Service became once again under the Ministry of Agriculture.

d) Mechanisms and processes

The UNEP/GEF funded Sustainable Land Management in the High Pamir and Pamir-

Alai Mountains (PALM) project produced scientifically-based approaches to developing the region's potential, while preserving the fragile environment and land resources through balanced and sustainable land management approaches. To raise awareness, mobilise action, and focus efforts on addressing the underlying causes of land degradation and mitigating its negative impacts on the ecosystems, and securing the livelihoods of local population, the PALM project facilitated the development of a Strategy and Action Plan for Sustainable Land Management in the High Pamir and Pamir-Alai Mountains. In this regard, the development of a Law "On protection of soil fertility on agricultural lands" (2012) under the framework of the PALM project was a major achievement for Kyrgyzstan (Pachova et al., 2012).

With the aim to adopt an integrated approach to rural development, the Developing Capacity for Strengthening Food Security and Nutrition in Selected Countries of the Caucasus and Central Asia project operationalises the linkages between social protection, nutrition, and agricultural interventions across food systems. Under its first output, the project piloted two policy options. The first pilot, School Food and Nutrition Program linked to the Agricultural Sector, aimed to strengthen linkages between local farmers and schools, to enhance the quality and diversity of the diet of school children and provide a stimulus to the local economy. The second pilot involved the development of Productive Social Contract/CASH+ models. By linking the beneficiaries of Kyrgyzstan's social protection programme to nutrition services and nutrition-sensitive agricultural practices, these models aimed to maximise nutrition and rural development outcomes.

By providing an evidence-based integrated approach to social protection, nutrition and agriculture, the two pilots will then feed into key policy processes at the country, regional, and global levels. This relates to the core of the project's second output: improved policies, legislation, and programmes to promote food security and nutrition. This output aims to

identify gaps and opportunities for cross-sectoral action and synergies, improve current policy frameworks, and develop a Comprehensive Program on Food Security, Nutrition and Social Protection (FAO, n.d.b).

The Ministry of Agriculture together with the UN System in the Kyrgyz Republic, has worked on the strategic national programme for the development of sustainable food systems by 2030. This programme is the result of the national dialogues on ‘Sustainable systems of the Kyrgyz Republic: through the introduction of innovative solutions, green economy and adaptation to climate change’, which was presented in Bishkek on 8 July 2021 (UN Kyrgyz Republic, 2021).

Despite having made significant gains in the prevention of childhood malnutrition in the past decade, Kyrgyzstan is facing a complex challenge in improving nutrition. Impoverished households continue to struggle for basic food security. As a result of poor nutrition, they also face the triple burden of malnutrition, with people from all socio-economic groups suffering from micronutrient deficiencies, overweight, and non-communicable diseases. In 2019, the government of the Kyrgyz Republic and the WFP conducted a Fill the Nutrient Gap (FNG) analysis to identify opportunities within the food system to improve access to, and affordability of, nutritious diets. However, the COVID-19 pandemic and macroeconomic fluctuations have impacted household livelihoods and food prices. Because of these changes and updates to national policies, in 2021, using new data collected, the second FNG was conducted. The main objective was to assess the changes in the cost of nutritious diets and re-assess the extent of non-affordability of nutritious diets. The analysis highlighted the need to “provide evidence to support the Ministry of Agriculture in the drafting of the new Food Security and Nutrition Programme, and advocate for a stronger monitoring mechanism of the programme” (WFP, 2022a, p. 6).

e) Reforms – current and future

Recent improvements to sustainable agriculture law. In general, the Kyrgyz government has undertaken many important legislative initiatives that affect the agricultural economy. Some of them are crucial and aimed at achieving sustainable agricultural and food security for the country.

Law on pastures. The most important system of agriculture in Kyrgyzstan is livestock farming, which has a long tradition in the country where many people used to live as nomads. The Kyrgyz keep mainly cattle, sheep, and goats, but they also breed yaks, equestrian horses, and camels. Nearly two-thirds of the population live in the countryside and many financially exist on raising livestock, sometimes in combination with cultivation. Wool, meat, and skins are important agricultural products. Livestock is regarded as financial capital and usually determines the level of well-being of households (Anarbaev, 2022).

To improve the condition of pastureland and solve various conflicts and administrative issues in pasture use, the Law on Pastures was introduced in 2009. With the aim of decentralisation, the administration of pastureland was transferred to a Pasture Committee (*Jaiyt Komiteti*) at the municipality level. The rental system of pastures was replaced by the ‘fee per animal head’ system called ‘pasture tickets’ by taking into account the carrying capacity of the pasture. Each Pasture Committee develops a management plan, which covers monitoring, soil and vegetation improvement, activities that address soil erosion, restoration of degraded lands, and improvement of infrastructure in pastureland. However, a legal framework to regulate soil protection, soil fertility, preservation of quality, and protection from degradation and other negative phenomena associated with the ownership, use, disposal of agricultural land was still necessary.

Law on soil fertility. The Law on Soil Fertility for Protection of Agricultural Lands (2012) was introduced to protect the soil and its fertility, preserve soil quality, and protect soil from

degradation where it is used for agriculture. Specifically, it aims at regulating activities and competence in the field of soil protection and ensuring that fertility of agricultural land is maintained or improved. With an emphasis on fertility, this law serves as the basis of agriculture and food security of the country. In this regard, it emphasises that soil, if managed correctly, not only retains its quality but also improves its fertility. The value of soil is determined not only by its economic significance for rural, forest, and other sectors of the economy; it is also determined by the irreplaceable environmental role of soil as the most important component of the biosphere. In the framework of the PALM project, local farmers were encouraged to use sustainable land management practices, such as legume crop farming, which is known for nitrogen fixation from the air and flourishing nitrogen-deficient soils. In addition, the project stimulated cultivation of vegetables and contributed to better nutrition and food security (Pachova et al., 2012).

To implement the State policy on soil protection in the agricultural sector, particularly the conservation of soil fertility, in 2016, the Ministry of Agriculture introduced the Concept for Soil Fertility Conservation and Improvement of the Kyrgyz Republic for 2017–2020, together with a detailed action plan. There is a state body to implement the policy on soil fertility protection and monitor soil protection and the other important activities set out in this law.

Law on Organic Agricultural Production.

Discussions about the necessity for the legal framework on organic agriculture took place over many years. In the beginning, the movement was facilitated by local enthusiasts and found support among international development agencies. Later in 2012, the Federation of Organic Development Bio-KG was founded to support the organic movement in Kyrgyzstan. The farmers and land-users who support the concept of organic agriculture and application of organic techniques strongly advocate for large-scale organic farming development on a national level. The Law on Organic Agricultural Production

was introduced in 2019 and established the fundamental legal framework. Moreover, this law contributes towards the recognition of Kyrgyzstan as a land of ecologically clean and healthy food production.

f) International commitments relevant to sustainable agriculture

UNFCCC (Paris Agreement). The Kyrgyz Republic's National Determined Contribution (NDC) represents its plan to fight climate change and its contribution to the global effort to reduce greenhouse gas (GHG) emissions. It indicates directions for a low-carbon transformation until 2030, with consideration given to national priorities and the Sustainable Development Goals. The NDC is underlined by mitigation actions and policies covering five sectors. However, the primary mitigation capacity is concentrated in the energy, agriculture, forestry, and other land uses sectors. In the agriculture sector, a GHG reduction will be achieved through the reduction of the livestock headcount, increasing productivity and improving the pedigree stock, as well as by expanding the area of cultivated organic crop farming lands, increasing the efficiency of the application of manure as a fertiliser and generation of biogas (Kyrgyz Republic, 2021, pp. 5–6).

UNCCD (LDN Targets). Land degradation neutrality (LDN) is a priority target for the Kyrgyzstan government and is reflected in the National Sustainable Development Strategy. In line with SDG 15.3, Kyrgyzstan set a number of LDN voluntary targets to improve environmental conditions of pastures, improve infrastructure for access to 10,000 ha of pastures, and adopt sustainable land management practices on 100,000 ha of pastures and forests (Kyrgyz Republic, Ministry of Agriculture, Food Industry and Amelioration of the Kyrgyz Republic, 2017).

3. Conclusion

Sustainable agriculture in Kyrgyzstan is a struggle both economically and environmentally, and lack of proper nutrition has a negative impact on the

population. Nevertheless, there is hope on the horizon, from a variety of programmes funded by foreign aid in an attempt to not only provide Kyrgyzstan with proper nutrition but also make their agricultural practices sustainable.

More than half of the total population of the country live in rural areas and therefore, development of agriculture is both an economic and a social task. As a result of agricultural support projects, the use of leguminous fodder crops, such as sainfoin, alfalfa, and other legume crops, which can fix nitrogen in the soil, have been introduced into crop rotation. This practice should be encouraged and distributed nationwide. Conceptually, agriculture undertaken in the mountainous areas of Kyrgyzstan is considered as high-risk farming as it is very sensitive to climate conditions. The *About Development of Agriculture Law* (2009) focuses on growth of production volumes of the agro-industrial complex, improvement of product quality, ensuring food security of the country, as well as the creation of sufficient state reserves.

However, there is no mention of climate change or adaptation plans. Therefore, the national programmes and strategic documents should also consider the environmental issues and climate change aspects, if the government wants to ensure food security through increasing the volume of domestic production and productivity in agriculture. Adaptation plans should consider decreasing water loss and increasing and modernising the capacity of the irrigation systems available in the country.

Generally, Kyrgyzstan has made improvements towards achieving the SDGs. There is a good

trend in the reduction in poverty and stunting. However, due to limited arable land resources, the country remains highly dependent on food imports, mainly cereals. The economy lacks large investments, is dependent on remittances, and faces increasing risks from geopolitical instability and climate-related challenges.

Since the majority of the population of Kyrgyzstan live in rural areas, they suffer more from absolute and relative poverty compared with the urban population. Additionally, lack of employment opportunities causes migration to urban areas and abroad, particularly affecting the youth population. This migration process contributes to the ageing of the rural population and is leading to the feminisation of agriculture.

In 2021, the Ministry of Agriculture, together with the facilitation of donor organisations prepared the draft Concept of Agrarian Development of the Kyrgyz Republic until 2025, the Food Security and Nutrition Program until 2023, the sectoral strategies of key government bodies, and policy documents relating to sustainable development. To achieve the goals and objectives of the strategy, it is necessary to harmonise the legislation, taking into account current realities, significantly increasing state support of the agriculture and industrial sectors, improving the conditions for attracting investments, and increasing the responsibility and role of implementing authorities over industrial development in the regions. To support these tasks, it will be important for the government to have an effective coordination mechanism among government bodies responsible for implementing state policy on agriculture development and food security.

Case study 4 Uganda

by Ian Hannam

1. Introduction

The agriculture sector is the most important sector in Uganda's economy for food and nutritional security, employment, income, raw materials for industry, and exports to regional and international markets. Uganda can rely on agriculture due to the country's excellent access to water resources, fertile soils, and its regular rainfall, although it still suffers from intermittent droughts such as in 1993–1994. Most areas receive sufficient rain to support subsistence agriculture. Although population growth has created pressure for land in a few areas, land shortages have been rare, and only about one-third of the estimated area of arable land is under cultivation.

The government's vision is to transform the agriculture sector from subsistence farming to commercial agriculture. Regulation of agricultural activities is critical to create standards to regulate land for agricultural purposes, soil governance, livestock management, crop production and management, regulation of water for agriculture, pesticides control, fertiliser management, and regulation of investment in the agricultural sector and taxation. The policy and legal frameworks provide opportunities in regulating the critical land use legal issues, but there are still implementation challenges due to lack of knowledge and awareness, gaps in the policies and laws, especially incentives for small-scale farmers and protection of their health and safety (Kasimbazi, 2020).

a) Livelihoods dependent on agriculture

There are 2.5 million farmers in Uganda with smallholdings which, together with some scattered large commercial farms, provide the country's staple food requirements. The agriculture sector accounts for the largest share of employment pegged at 36% (UBOS, 2018, p. iv).

For over 20 years, The Hunger Project Uganda has prioritised mobilising and training farmers to adopt eco-friendly farming methods as a step towards improving agricultural productivity and leading sustainable livelihoods (Okeya, 2021). The 2018 National Household Survey by the Uganda Bureau of Statistics recorded an increase in poverty from 19.7% in 2012 to 21.4% in 2016 (UBOS, 2018). Other reports show that the country continues to grapple with consistent food insecurity and nutritional deficiency, as a significant percentage of the population suffers from acute food shortage. In 2011, the FAO reported that Uganda had a Global Hunger Index (GHI) score of 16.7%, emerging 42nd out of 81 countries ranked, with its hunger situation considered 'serious'.

b) Percentage of rural families

Agriculture in Uganda accounts for 90% of export earnings and provides 44% of GDP. The World Bank data of 2022 indicates that of the total population of 49.6 million, 74% live in rural areas and 73% of the workforce are employed in agriculture (World Bank, n.d.d).

Uganda has a low degree of urbanisation, the vast majority of the population being concentrated in rural areas, with only 26.5 % living in urban areas in 2021.

The share of the urban population in Uganda increased from 12.3% in 2002 to 18.6% in 2014, which represents an annual urban growth rate of 5.2%. Then, from 2014 to 2021, the annual growth rate represented 8.8%, one of the highest in the world (MoLH&HD, 2022).

c) Inhabitants

Based on 2024 UN data, the population of Uganda is 50 million (UNDATA, 2024). Uganda is populated by dozens of ethnic groups. The English language and Christianity united these

diverse peoples. The Swahili language unites the country with its East African neighbours Kenya and Tanzania. Uganda obtained formal independence on 9 October 1962. Its borders, drawn in an artificial and arbitrary manner in the late 19th century, encompassed two essentially different types of societies: the relatively centralised Bantu kingdoms of the south and the more decentralised Nilotic and Sudanic peoples to the north. The country's sad record of political conflict, coupled with environmental problems and the ravages of a countrywide AIDS epidemic, hindered progress and growth for many years. Yet, even so, at the beginning of the 21st century a popularly elected civilian government ruled Uganda, which had attained political stability, had set an example for tackling the AIDS crisis that threatened to overwhelm the continent, and enjoyed one of the fastest-growing economies in Africa (Kokole et al., 2025).

d) Indigenous/local communities and sustainable agriculture

In Lake Victoria Basin, local communities have coped and adapted to climate-induced hazards using traditional systems and Indigenous Knowledge Systems (IKS). In this area, there is significantly high community awareness implicating that climate change is the main challenge facing the agricultural sector. Along with climate change adaptation and mitigation measures, the local communities use myriad of IKS to improve resilience and productivity. They incorporate IKS in soil conservation, weather/climate forecasting, selection of planting seeds, and preservation of seeds/crops. Based on this information, it was recommended that IKS be incorporated into scientific knowledge systems to promote climate change adaptation and mitigation among vulnerable communities dependent on climate-sensitive resources (Tolo et al., 2014).

e) Environmental impacts from agriculture

Poor agricultural practices have resulted in increased land degradation from soil erosion

and soil nutrient depletion, deforestation, overgrazing, and water contamination. Some of the depleting practices include: poor threshing techniques, and outdated practices involving shelling, drying, storing, packaging, and transporting of agricultural produce. Overpopulation in some areas has resulted in land fragmentation and overuse, affecting land quality, agricultural production, and economic development. Land tenure security as it relates to access and ownership remains a major issue for women farmers (Kasimbazi, 2020).

f) Agriculture incidence on GDP

Agriculture in Uganda employs 73% of the workforce, accounts for 90% of export earnings, and provides 44% of GDP. With most of its inhabitants living in rural areas, Uganda's economy is mainly based on agriculture, as it accounts for most of its export earnings and for a large share of GDP. The most-produced crops include coffee, cocoa beans, and sweet potatoes. The gross domestic product in current prices of Uganda went from US\$ 9.98 billion in 2006 to US\$ 53.65 billion in 2024 (World Bank, 2024b).

g) FAO, UNEP, IUCN metrics on sustainable agriculture

FAO has worked in close collaboration with the Government of Uganda in the quest to eradicate hunger and improve nutrition of its population. Since 2010, this support was structured through a Country Programming Framework (CPF). The CPF 2015–2019 focused on three priority areas: i) production and productivity of agriculture, forestry and fisheries commodities; ii) agricultural knowledge and information; and iii) resilience to livelihood threats with emphasis on climate change (FAO, n.d.c).

FAO has a focus on improving agricultural productivity, engaging youth in agriculture, and tackling environmental degradation and climate change, all of which are critical to building self-reliance. Special emphasis is given to interventions in the region of Karamoja, where FAO is supporting the restoration of ecosystem

services and providing support to refugee and host communities. The aim has been to integrate refugee populations in medium and long-term development planning. Uganda has the potential to produce sufficient food to meet its own consumption needs and a surplus to export to other countries. FAO has partnered with key ministries, institutions, research organisations, the private sector and academic institutions to address production constraints, including low productivity levels characterised by small acreages and yields, limited access to improved technologies and poor harvests. Working with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), FAO has helped to establish sustainable practices and technologies in horticulture, cereals production, aquaculture, livestock, and agribusiness (FAO, 2018e).

UNEP's project on Reducing the Climate Change Vulnerability of Local Communities in Uganda through ecosystem-based adaptation (EbA) in forest and wetland ecosystems (2019–2024), executed by the Ministry of Land, Natural Resources and Environmental Protection, demonstrates the implementation of ecosystem-based measures in pilot sites around forests and wetlands, while providing training to the local and national government to implement Nature-based Solutions and integrate them into existing forests and wetland management plans. The project also aimed at increasing the capacity of local communities to adopt alternative livelihoods and climate-smart agricultural techniques (UNEP, n.d.b).

Uganda made a significant pledge to the **Bonn Challenge**, committing to bring **2.5 million hectares** of degraded and deforested land into restoration by 2020. Since over 70% of Uganda's population depend on agriculture, the need to restore degraded and deforested lands is crucial. Currently, IUCN is working in Uganda to enhance the resilience of landscapes and the communities that depend on those lands for their livelihoods. Some of the projects focus on training farmers on

the implementation of different forest landscape restoration (FLR) practices and interventions. The programme has already trained over 150 farmers and technical personnel on a technique called farmer-managed natural regeneration (FMNR) to promote the regeneration of lands that have been cleared for farming. This low-cost sustainable landscape restoration technique aims to improve the productivity of agricultural lands while increasing tree cover and biodiversity. The restoration is carried out primarily through the management of the tree stumps of Indigenous trees, which remain after clearing land for farming, to facilitate regeneration (IUCN, 2017b).

2. Governance framework enabling sustainable agriculture (land management)

a) Legislation

The regulation of land for agricultural purposes is enshrined in the 1995 Constitution of Uganda and other laws. The Constitution provides for environmental protection and conservation and sets out National Objectives and Directive Principles of State Policy under which Objective XIII provides for the state to protect important natural resources. Objective XXVII provides for sustainable environmental management and Article 39 provides that every Ugandan citizen has a right to a clean and healthy environment.

The Constitution also provides for land ownership. Article 237 provides that all land belongs to the people of Uganda and shall be owned in accordance with the land tenure systems: customary; freehold; *mailo*¹⁶¹ and leasehold. The Land Act Cap 227 is the main law on land management and provides for the tenure, ownership, and management of land for agriculture. According to Sections 2 and 3 of this Act, the ownership of land is vested in the citizens of Uganda and land can be owned under customary, freehold, *mailo*, and leasehold tenure

¹⁶¹ In Uganda, *mailo* is a land tenure system similar to freehold, in which political nobles were accredited land at the start of the 20th century, and passed it on hereditarily, without the possibility of contesting ownership.

systems. The Act promotes land registration (the creation of a customary register to facilitate the registration of customary rights and issuance of customary certificates of ownership) and conversion of customary tenure to freehold tenure, conversion of leasehold into freehold and formation of a communal land association by any group of persons connected with communal ownership and management of land, whether under customary law or otherwise.

Land and resource ownership determines use, who benefits, and who has rights and responsibilities for the land and its resources. Therefore, to some extent, agricultural activities in Uganda are greatly determined by land rights. The law does not prescribe which agricultural activities should be carried out under a specific land tenure system, so that the land tenure systems do not impact on agriculture in any way. It should however be noted that some farmers in Uganda grow crops and rear animals on land owned by someone else. The development of landlord tenancy laws and concepts, which provide for the temporary use of land by another, with assurances of being paid rent, make the extensive use of leases within Ugandan agriculture important.

The National Environment Act (NEA) Cap 153 provides for the sustainable management of the environment and natural resources. Section 40(2) of the Act mandates the National Environment Management Authority (NEMA) to issue guidelines and prescribe measures for the sustainable use of hillsides, hilltops, and mountainous areas, including those relating to appropriate farming methods, carrying capacity of the areas in relation to animal husbandry and measures to curb soil erosion.

The National Environment (Minimum Standards for Management of Soil Quality) Regulations, Statutory Instrument Number 59 of 2001, establishes minimum soil quality standards that are to be maintained for the management of soil quality, the criteria and procedure to measure and determine soil quality, and guidelines for soil management. The fourth schedule of the

Regulations provides that soil conservation is required as a basis for environmentally sound production of food, based on the sustainable use of land, species, and ecosystems. It also recommends the combination of several conservation practices based on size of the holding and the crops grown, livestock, and tree species.

The National Environment (Wetlands, Riverbanks and Lakeshores Management) Regulations of 2000 provide for the conservation and wise use of wetlands and their resources, and facilitate the sustainability and conservation of resources on riverbanks and lake foreshores for the benefit of the people and community living in the area. Regulation 11 provides for uses of wetlands, where a person desiring to carry out any of the regulated activities listed in the Second schedule or extract in a wetland shall make an application, except for activities, such as cultivation, where the cultivated area is not more than 25% of the total area of the wetland.

The National Environment (Environmental Impact Assessment) Regulations 1998 establishes procedures to conduct an environmental impact assessment. Regulation 3 provides for the application of the regulations to projects listed in the Third Schedule to the Act, including agricultural related activities, such as large-scale agriculture, use of new pesticides, introduction of new crops and animals, and use of fertilisers.

The Prohibition of the Burning of Grass Act Cap 33 prohibits burning of grass in all areas in Uganda without authorisation from a sub-county chief, veterinary officer, agricultural officer or forest officer. Bush burning affects soil fertility, a key component to agricultural productivity. The need to monitor and avoid the negative effects of agricultural land use has seen the emergence of science and technology as the link between soil management and governance. The Cattle Grazing Act Cap 42 controls and regulates cattle grazing in particular areas of Uganda. Under the Act, 'cattle' means bulls, cows, oxen, calves, sheep, and goats, and Section 2 of the

Act prohibits grazing cattle on any land where the veterinary officer or district administration has prohibited grazing. An order can be made prescribing the maximum number of cattle that may be grazed on any specific area of land.

The Uganda Forestry Policy 2001 is the main policy for the sustainable increase in the economic, social, and environmental benefits from forests and trees especially by the poor and vulnerable. Policy Statement 6 provides for the development of strategies for promotion of tree-growing on farms in all farming systems and innovative mechanisms for the delivery of forestry extension and advisory services. The policy promotes farm forestry to boost land productivity, increase farm incomes, alleviate pressures on natural forests and improve food security. The Forestry Policy provides opportunities for tree farming on private land, including for non-wood products and fruit trees. The National Forestry and Tree Planting Act 2003 was enacted to implement the 2002 Forest Policy and promotes the sustainable use of forest resources, protect forests and forest produce, enhance the productive capacity of forests, promote tree planting, and regulate trade in forest produce as a form of agricultural investment.

The Water Act Cap 152 provides for the use, protection, and management of water resources. Its objectives include promoting the management and use of water through the introduction of standards and techniques for the investigation, use, control, protection, management, and administration of water resources. The Water Resources Regulations 1998, made under the Act, define procedures for regulation of water abstraction permits. Under Regulation 6, the factors to be taken into account by the Director when considering an application include the existing and projected availability of water in the area, water quality, any adverse effect which the facility or allocation or use of water under the permit is likely to have on the existing authorised uses of water, an aquifer or waterway, the drainage regime, the availability

of any alternative sources of supply, and the need to protect the environment.

b) Policies

Sustainable agriculture law in Uganda includes the policies, strategies, and the processes of decision making regarding the use of land for agriculture. This requires international and national collaboration between governments, local authorities, industries, civil society organisations, and citizens to ensure implementation of policies that encourage practices and methodologies that regulate resource usage and to avoid conflict between users to promote sustainable land management. Sustainable agriculture law is directed towards the impacts of land degradation on food production and conflicts that arise between the need for human settlements and space available for food production (Kasimbazi, 2020).

The National Land Policy of 2013 is a framework for the use of Uganda's land resources. The Policy has two major objectives: i) to re-orient the land sector in national development by articulating management and coordination between the land sector and other productive sectors in the economy; and ii) enhancing the contribution of the land sector to the social and economic development of the country (Kabanda, 2013). Its goal is to ensure the management of Uganda's land resources for poverty reduction, wealth creation, and overall socio-economic development. Policy Statement 148 provides for the government to regulate the use of land and water resources for agricultural production aligned with a National Agricultural Policy. The strategies to achieve the policy statement require government to prepare a national agriculture policy and a national soils policy, and ensure viable zonal agricultural production to enhance production, productivity, marketing and agro-processing, promote farming practices that reduce land degradation and enhance soil quality and productivity, and encourage voluntary consolidation of agricultural land holdings to sizes suitable for optimum, productive, and sustainable use (Kabanda, 2013).

The National Irrigation Policy 2017 aims to transform agriculture through irrigation development. Its goal is to ensure sustainable availability of water for irrigation and efficient use for crop production, productivity, and profitability that will contribute to agriculture sustainability, food security, and wealth creation. Priority area 1 under the Policy is to enhance investment for irrigation development by public, private, and other users.

The National Water Policy 1995 provides a framework for the provision of water of adequate quantity and quality for all agricultural activities and investment needs. Its objective is to sustainably manage and develop the water resources to secure and provide water of adequate quantity and quality for all social and economic needs of present and future generations. Section 1.2 promotes development and efficient use of water in agriculture to increase productivity and mitigate effects of adverse climatic variations on rain-fed agriculture. Chapter 6 deals with the water supply policy and strategy for crops and livestock. The main objective is to promote development of water supply for agriculture to modernise agriculture and mitigate effects of climatic variations on rain-fed agriculture.

The 1995 National Policy for the Conservation and Management of Wetland Resources complements the goals and objectives of the National Environment Management Policy (NEMP) 1995. Its goal is to maintain an optimum diversity of uses and users and consideration for other stakeholders when using a wetland. In relation to agriculture, the relevance of the Policy is premised on the need to protect wetland systems, maintenance of biodiversity, and the environmental impact assessment requirement for all projects in wetland areas.

Several policies and laws regulate the use of pesticides in agricultural areas. The National Policy for Disaster Preparedness and Management 2010 notes that pest numbers increased due to one or a combination of ecological factors, including temperature, monoculture, introduction of new pest species, weak genetic

resistance, poor pesticide management, bad weather patterns, and migration. Pests damage plants and harvested crops, consequently leading to food shortages, famine, and economic stress. Risk can be reduced through pest monitoring and using an integrated pest management approach. The 2006 Agricultural Chemicals (Control) Act controls and regulates the manufacture, storage, distribution and trade, use, importation, and exportation of agricultural chemicals and for other related matters. The Control of Agricultural Chemicals (Registration and Control) Regulations of 1989 requires the Agricultural Chemicals Board to register agricultural chemicals, fumigators, commercial applicators, and premises. The regulations give restrictions on storage, use, safety, disposal of agricultural chemicals, and safeguard of the environment. In accordance with the National Environment Act Cap 153, any investor who wishes to introduce any agricultural chemical that is likely to have an impact on the environment and soil quality is required, like any other developer, to undertake an environmental audit and to also carry out an environmental impact assessment to ensure that such chemical does not affect the environment and soil quality.

Fertiliser management in the agricultural sector is regulated by the National Fertilizer Policy of 2016. Its objective is to ensure that the fertiliser industry provides affordable and accessible fertilisers to farmers for increased and sustainable agricultural productivity and farm incomes. The National Environment Act Cap 153 under schedule 3 requires an EIA to be undertaken for large-scale agricultural projects, use of pesticides, introduction of new crops, and use of fertilisers.

c) Institutions

The [Uganda Ministry of Agriculture, Animal Industry and Fisheries](#) (MAAIF) and the [Ministry of Water and Environment](#) (MWE), are the key institutions in the application of measures and programmes to achieve sustainable agriculture in Uganda. Among the key responsibilities of the

MAAIF include: the implementation of national policies, plans, strategies, regulations and standards, and enforcement of laws, regulations and standards along the value chain of crops and livestock; managing epidemics and disasters; regulating the use of agricultural chemicals; supporting the development of infrastructure and use of water for agricultural production; maintaining and disseminating agricultural statistics and information; undertaking measures to increase production and commercialisation of agriculture for food security and household income; strengthening human and institutional capacity; and mobilising financial and technical resources for delivery of agricultural services.

In addition, MAAIF has responsibility for a number of agencies which have specialised roles in the achievement of sustainable agriculture, including: the National Agricultural Research Organisation; the National Agricultural Advisory Services for delivery of advisory services; the National Animal Genetic Resource Centre and Data Bank; the Dairy Development Authority; the Uganda Coffee Development Authority; and the Cotton Development Organisation.

The MWE is responsible for water and environmental resources in Uganda. It prepares national policies and standards, regulates water resources, and sets priorities for water development and management. It also monitors and evaluates sector development programmes. The three main institutions of MWE are the Directorate of Water Resources Management, the Directorate of Water Development, and the Directorate of Environmental Affairs.

The National Environment Management Policy outlines the environmental management issues and legal frameworks, including EIA guidelines. The [Environmental Guidelines to Local Governments for Strengthening Compliance with Safeguards Requirements in Development Projects](#) are to ensure the integration of environmental, social, and climate change concerns in project development. They provide a means of minimising environmental and social risks and impacts, specify roles

and responsibilities and outline reporting procedures, as well as procedures to manage and monitor environmental concerns, including compliance with the law for environment and climate change aspects.

d) Mechanisms and processes

The need for sustainable agriculture in Uganda has been met with help from organisations, such as the [Uganda Sustainable Agriculture Support Organization](#), which trains people in sustainable farming methods. Ugandans are taught to plant and care for the foods they grow. The women comprise a significant part of the workforce. They, along with children, learn to fertilise soil and create a sustainable food source for the country through farming. In 2004, Uganda adopted the Uganda Organic Standard, which helped make significant changes in its economy. This standard helped improve income and food security, as well as increase the number of certified organic farmers by 359% between 2002 and 2007. The area under organic agricultural production has also increased substantially. It also helped reduce greenhouse gas (GHG) emissions and agricultural chemical runoff into local water bodies (Williams, 2017).

In Uganda, with over 70% of the population employed in agriculture, the majority of people in rural areas own land. However, many families cannot efficiently farm their land because they lack the seeds to plant. These families suffer from shortage of food and agricultural products for sale, especially during the dry season. The Uganda Rural Fund (URF) offers several programmes to address this problem. The URF purchases seeds at a fair market price from local farmers who have abundant produce. URF in turn donates the seeds to poor families, widows, and orphans' homes so they can grow enough produce for food and sell the surplus to earn some income. Depending on how the harvest turns out, at the end of the season, the families who received seed donations are expected to give back a portion of their harvest to URF who then redistribute the seeds to other needy families. Through encouraging the spirit of giving back,

the programme creates a long-sustained impact in the lives of many families in rural areas. URF also organises agriculture workshops inviting experts in the field to train farmers on improved farming practices and markets for agricultural produce (URF, n.d.).

e) Reforms – current and future

The second Voluntary National Review on Uganda's performance with the SDGs in 2020 indicates that the Sustainable Development Solutions Network (SDSN), which ranks 52 African countries based on 97 indicators across all 17 goals, placed Uganda in 18th place. Uganda receives an overall score of 54.88 (compared to the regional average of 52.7). This score indicates that Uganda is more than 50% of the way towards achieving SDGs by 2030 and is on track with some of the SDG 13 targets on climate action that is measured by the number of people affected by climate-related disasters. However, regarding SDGs on poverty, hunger, education, clean water and sanitation, affordable and clean energy, sustainable cities, life on land and peace and justice, Uganda's performance are stagnating, meaning their scores on relevant indicators remains stagnant or is increasing at a rate below 50% of the growth rate needed to achieve the SDGs by 2030 (Republic of Uganda, 2020).

In relation to SDG 2, End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture, it has been reported that the past decade has seen progress in improving the nutritional status of children in Uganda. The prevalence of stunting among children under five years of age has declined from 33% in 2011 to 29% in 2016, with the highest prevalence among children in rural areas (30%) compared with urban areas (24%). In absolute numbers, the population of 2.4 million stunted children is very high, necessitating investment in nutritional support for malnourished children as well inter-sectoral collaborations and partnerships for nutrition (Republic of Uganda, 2020). For example, the Sustainable Agriculture for Rural Development (SARD-Net) network for

Uganda has trained up to 30,000 smallholder farmers in sustainable farming practices and the percentage of targeted households that are food secure all year increased from 11% at baseline in 2017 to 75% by 2021 (SARD-Net, n.d.). The SARD-Net outlines that they are working towards this by improving household food security, increasing household income, improving families' abilities to prepare for and cope with emergencies in agriculture through research and improving on and off-farm management of natural resources. SARD-Net's Strategies for promoting Sustainable Agriculture in Uganda include promoting sustainable farming systems, for example seed security, climate resilience, agroecology, Indigenous knowledge on food and agriculture, agriculture market development, such as agricultural financing, value chain development, quality, and standards, and influencing policies on advocacy (SARD-Net, n.d.).

f) International commitments relevant to sustainable agriculture

UNFCCC (Paris Agreement). The Land Use and Land Use Change and Forestry category accounts for 59.5% (53.6 MtCO₂e) of Uganda's total emissions. The land sector was estimated to be a source of emissions, instead of a sink and agriculture, is the second largest contributor accounting for 26.9% (MWE, 2022). The vulnerability and risk assessment processes indicated that the priority sectors for adaptation in Uganda remain ecosystems, water, agriculture, and forestry. As part of the long-term strategy formulation and National Determined Contribution (NDC) update process, 13 pillars were identified to transform Uganda into a climate-resilient and low-carbon society by 2050. A number of these are directly related to sustainable agriculture, including: promotion of climate-resilient and low-carbon agricultural development; promotion and application of land management practices that support sustainable and productive use; promotion of climate-resilient water supply systems, increase water supply capacity and use efficiency; promotion of sustainable management of ecosystems and the use of nature-based solutions, including through

community engagement; and strengthening of climate information services through improved data collection and sharing infrastructure (Republic of Uganda, 2020).

UNCCD (LDN Targets). Uganda has made a substantial effort to assess and improve the condition of affected ecosystems, combat desertification and land degradation, promote sustainable land management, and contribute to land degradation neutrality (LDN). This includes improving trends in land cover, trends in land productivity or functioning of the land, trends in carbon stocks above and below ground, and the proportion of degraded land over the total land area (UNCCD, 2023b). Further, Uganda has defined several activities to support the implementation of the UNCCD, including policies and planning, types of SLM practices to address desertification and drought, and rehabilitation and restoration practices (UNCCD, 2023b).

3. Conclusion

Agriculture is the predominant land use and economic activity in Uganda, and the government's vision is to transform the agriculture sector from subsistence farming to commercial agriculture. Regulation of the activities in the agricultural sector is critical because there is a need to create standards to regulate land for agricultural purposes, soil governance, livestock management, crop production and management, regulation of water for agriculture, pesticides control, fertiliser management, regulation of investment in the agricultural sector, and taxation. Whereas a good policy and legal framework has been developed and provides opportunities in regulation of the main legal issues, there are still challenges of implementing the policies and laws due to lack of knowledge and awareness, gaps in the policies and laws, especially incentives of small-scale farmers and protection of their health and safety.

Case study 5 Viet Nam

by Duong Khuu

1. Introduction

a) Geographical and political administrative contexts

Viet Nam is a rapidly growing economy in the Southeast Asia region. Three-quarters of Viet Nam's land area are hills and mountains, with 80% of its population live in the remaining low-lying regions that are divided into the Red River Delta in the north, Mekong River Delta in the south, and in the narrow coastal plains of Central Viet Nam (Sterling et al., 2006). Accordingly, the climate pattern varies among these three regions. Northern Viet Nam has sub-tropical climate featured by cold winter and north-eastern wind, whereas southern Viet Nam has a typical tropical climate featured by rainy and dry seasons. Lying in between, Central Viet Nam faces harsher weather featured by dryness and foehn wind.

There are three levels of state administration. On the first level, the country currently has 58 provinces and five municipalities (Hanoi, Da Nang, Ho Chi Minh city, Can Tho, and Hai Phong) under the administration of the central government. On the second level, the 58 provinces are divided into cities, districts, and towns, for a total of 63 administrative provinces. On the third level, the provincial cities/towns are divided into wards and communes.

b) Socio-economic context

Since the economic reform of 1986, Viet Nam's socio-economic development has achieved major successes: rapid growth, shifting focus on agriculture to services and industry, and increased competitiveness in global markets (Table 1). In particular, GDP grew rapidly with an average of 5–7% between 1990 and 2019. Rapid growth has reduced poverty significantly, plummeting from 52.8% in 1993 to below 2% in 2020 (headcount ratio at US\$ 1.9 per day) (World Bank, n.d.e).

In 2024, Viet Nam's population was 100.98 million people (World Bank, n.d.f), with 60.39 million – 60% – considered rural (World Bank, n.d.g). In the same year, GDP reached US\$ 476.39 billion, 11.9% of which came from the agriculture, forestry, and fisheries sector (reduced from 46.3% in 1988) (World Bank, n.d.h). GDP per capita as of 2024 was US\$ 4,717.

c) Viet Nam's agriculture sector

Viet Nam is a key player in global agricultural production. Since the *Doi Moi* policy of 1986, the agriculture sector has played an essential role in Viet Nam's economy, society, and environment. Viet Nam's agriculture sector includes crop production, livestock, fisheries, and forestry.

From an economic perspective, although the agriculture GDP constantly decreased from 41% to 12% from 1986 to 2022. Viet Nam remains a major global agricultural powerhouse and a leading (top 10) exporter of key agricultural commodities (rice, shrimp, coffee, cashew, and others). In 2022, export of agriculture, forestry, and fishery products was over US\$ 55.22 billion – a 9.3% increase from 2021. The export value of agricultural products was US\$ 22.59 billion, with the value of rice export at US\$ 3.49 billion and that of fruits and vegetables at US\$ 3.34 billion. In 2025, Viet Nam ranked as the world's second-largest rice exporter, after India, and surpassing Thailand (Government News, 2025). As of 2025, the main export market of Viet Nam's agricultural products was the USA (21%), while exports to the European Union increased by almost 39%, to Japan by nearly 20% and doubled for Africa (MAE, 2025). Smallholder farmers are the key suppliers of the commodities exported.

From a socio-economic perspective, the sector provides food security for the growing population, which depends on rice as a primary food staple, as well as income generation and livelihood opportunities for the rural population.

The sector used to employ about 65% of the national workforce in 2000 (World Bank, 2019). However, by 2021, of the 51 million employed labourers aged 15 and over, 14.1 (~27.6%) million worked in agriculture, forestry, and fisheries. Yet, agriculture remains a primary income source for over 50% of rural households (Cunningham & Pimhidzai, 2018). The sector's transformation has contributed significantly to pulling Viet Nam out of poverty (from 58.1% in 1992 to 6.75% in 2018) (World Bank, n.d.i), especially through increasing income from non-crop cultivation in rural households and ethnic minorities.¹⁶² However, income disparities between urban and rural populations remain. In 2020, on average, the income of urban residents was 1.5 times higher than that of rural residents (National Statistics Office, 2020). The sector's impressive growth and exports have environmental consequences, such as deforestation, natural resource depletion, loss of biodiversity, land degradation, and water pollution (ADB, 2013). Viet Nam is rich in water resources, but agriculture land is scarce, with only 0.12 ha of farmland per capita (one-sixth of world average) (OECD, 2015). With a growing population and demand for income and food, forest land is rapidly converted. Agricultural expansion has thus been a primary direct driver of deforestation. With government policies supporting exports since the 1990s, as commodity cash crop production expands, subsistence farming is pushed into marginal forested uplands, indirectly driving forest degradation through agricultural expansion for commodity markets (SNV, n.d.).

Agriculture production is currently the second highest emitting sector, accounting for 19% of the total national emissions in 2020, with 48% of agriculture emissions and over 75% of methane emissions coming from rice (World Bank, 2022a). However, rice production has currently reached its inflection point. Vietnamese rice farmers face problems of low productivity, shrinking cultivation areas, and inefficient input usage,

especially in the Mekong Delta which dominates a significant portion of land but faces reduced productivity.

As one of the world's largest delta systems, the Mekong Delta with its rich natural resources, has played a crucial role in Viet Nam's agriculture sector. It is home to 17 million people, contributes to 50% of Viet Nam's rice production and 90% of its rice export (World Bank, 2022b); whereas the delta accounts for 12% of Viet Nam's land area. Nevertheless, unsustainable farming practices, based on intensive chemical use, have caused land degradation, water pollution, and biodiversity loss (Nguyen Thanh et al., 2021). For example, fertiliser is the largest single-cost item for Viet Nam's main crops, especially rice (Liu & Wu, 2021). Following the consequences of unsustainable rice farming in Viet Nam's deltas, about 200,000 hectares of inefficient rice-growing land have been converted to other crops that offer higher economic benefits (PSAV, 2018). Similar to many other Asian countries, the shrinking trend of paddy land will continue in Viet Nam (Joshi, 2021).

In addition, Viet Nam is highly vulnerable to the impacts of climate change, which can have significant implications for the sustainability of agriculture. Addressing these impacts requires significant resources and coordination across sectors, in particular in the Mekong Delta, one of the [world's] deltas most affected by climate change (Nguyen Thanh et al., 2023).

2. Governance framework enabling sustainable agriculture (land management)

a) Viet Nam's international commitments to sustainability

As one of the poorest countries in the world in the late 1980s to early 1990s, with 60% of the population living below the poverty line,

¹⁶² Viet Nam is home to 54 ethnic minorities, making it one of the world's most culturally diverse countries.

Viet Nam mostly escaped poverty and ensured a balance of food in 2000, thanks to the *Đổi Mới*¹⁶³ policy. After that, and through under the policy of active international integration, Viet Nam joined the World Trade Organization in 2007 and subsequently signed 17 free trade agreements.

Alongside global integration that boosts socio-economic development, Viet Nam is also now a party to several important international sustainability policy frameworks, including:

- Convention on Biological Diversity (CBD), 1992 (signed 1993 and ratified 1994);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973 (signed 1994);
- United Nations Framework Convention on Climate Change (UNFCCC), 1992 (signed 1992 and ratified 1994);
- Nagoya Protocol, 2010 on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD; and
- 2030 Agenda for Sustainable Development (with 17 Sustainable Development Goals) 2015).

These commitments have driven the Vietnamese government's support for transitioning to a more sustainable agriculture through various national policies. The recently

signed EU-Viet Nam Free Trade Agreement (signed on 30 June 2019) provides further evidence of this orientation and puts more pressure on the need to address the issues of food security and sustainability.

In December 2021, at COP-26, Prime Minister Pham Minh Chinh made a commitment that Viet Nam will strive to achieve 'zero' net emissions by 2050 and two other commitments closely related to the agricultural sector: participate in the initiative Reducing Global Methane Emissions and implement the Glasgow Declaration on Forests and Land Use. Furthermore, at the United Nations Summit on Agri-Food Systems, Viet Nam aims to become a transparent, responsible, and responsive food producer and supplier, meeting the requirements for food security and nutrition of about 100 million Vietnamese people and for export (MAE, 2025).

b) Legislative framework governing sustainable agriculture

Vietnamese legislation includes: i) laws (or code) and resolutions passed by the National Assembly; ii) decrees passed by the government; iii) decisions passed by the Prime Minister; iv) circulars passed by ministries and resolutions; and v) decisions and directives issued by the local governments, including People's Councils and People's Committees (GOV, 2004). Legislation related to the transition towards sustainable agriculture in Viet Nam can be categorised into sectoral legislation and legislation on handling of agricultural activities (Table 1).

¹⁶³ The *Đổi Mới* policy (meaning "renovation" in Vietnamese) refers to the series of economic reforms launched by the Vietnamese government in 1986, aimed at transitioning the country from a centrally planned economy to a socialist-oriented market economy. These reforms liberalised trade, encouraged private enterprise, and opened Viet Nam to foreign investment — leading to rapid economic growth, agricultural modernisation, and significant poverty reduction (see [INSERT LINK](#)).

Table A1 Legislative framework governing sustainable agriculture in Viet Nam

1. SECTORAL LEGISLATION	
Socio-economic planning (Ministry of Planning and Investment – MPI)	
Law No. 21/2017/QH14 on Planning, adopted by the National Assembly on 24 November 2017	Provides for the formulation, appraisal, decision or approval, announcement, implementation, assessment, and adjustment of the planning under the national planning system; responsible for state management of planning (including plans for spatial organisation of rural areas and development of centralised agricultural production areas)
Law No. 61/2020/QH14 on Investment, adopted by the National Assembly on 17 June 2020	Applies to business investments in Viet Nam (including farming and agricultural activities, as well as projects aiming to support livelihoods of smallholder farmers)
Agriculture and Rural Development (Ministry of Agriculture and Rural Development – MARD)	
Law No. 31/2018/QH14 on Crop Production, adopted by the National Assembly on 19 November 2018	Prescribes plant varieties; fertilisers; cultivation; harvest, preliminary processing, preservation, processing, trading, and quality management of crop products. It also defines the rights and obligations of organisations and individuals engaged in crop production and state management of crop production. To use natural resources effectively and sustainably, the Law devotes Chapter IV to providing cultivation activities, focusing on use of natural resources, agricultural facilities, equipment, and supplies in cultivation. The exploitation and use of genetic resources of plant varieties comply with the provisions of this law and the law on biodiversity.
Law No. 32/2018/QH14 on Animal Husbandry, adopted by the National Assembly on 19 November 2018	Provides for livestock raising, rights and obligations of organisations and individuals involved in animal husbandry, and state management in animal husbandry.
Natural Resources and Environment (Ministry of Natural Resources and Environment – MONRE)	
Law No. 17/2012/QH13 on Water Resources adopted by the National Assembly on 21 June 2012	Regulates management, protection, exploitation, and use of water resources, as well as the prevention, combat against and overcoming of harmful effects caused by water in the territories.
Law No. 45/2013/QH13 on Land adopted by the National Assembly on 29 November 2013	Prescribes the land ownership, powers and responsibilities of the State representing the entire-people ownership of land and uniformly managing land, the land management and use regimes, and the rights and obligations of land users over the land in the territory of Viet Nam. Decree No. 43/2014/ND-CP detailing several articles of the Land Law, compensation, support, resettlement; land prices; collection of land use levy; collection of land and water surface rentals; and sanctioning of land-related administrative violations.
Law No. 20/2008/QH12 on Biodiversity adopted by the National Assembly on 13 November 2008	Aims to protect Viet Nam's biodiversity and natural resources. It includes provisions on the conservation of biodiversity, sustainable use of natural resources, and protection of endangered species. The law also includes specific provisions on agricultural biodiversity such as the preservation of traditional crop varieties and animal breeds.

Law No. 72/2020/QH14 on Environmental Protection adopted by the National Assembly on 17 November 2020

Sets out the legal framework for environmental protection in Viet Nam. It includes provisions on environmental impact assessment, pollution control, and waste management. It also includes specific regulations for the agriculture sector such as regulations on pesticide use and wastewater treatment.

2. LEGISLATION HANDLING OF VIOLATIONS OF AGRICULTURAL ACTIVITIES

Law No. 15/2012/QH13 on Handling of Administrative Violations adopted by the National Assembly on 20 June 2012

Promulgates administrative sanctions for the violations related to a certain number of unsustainable agricultural activities.

Decree No. 114/2013/ND-CP dated 03 October 2013 lays out regulations on sanctioning of administrative violations in the field of plant varieties, plant protection and quarantine.

Decree No. 139/2013/ND-CP dated 20 October 2013 stipulates penalties for administrative violations on exploitation and protection of irrigation works, dikes, flood and storm prevention.

Decree No. 157/2013/ND-CP dated 11 November 2013 stipulates penalties for administrative violations in forest management, forest development, forest protection and forest product management.

c) Key national policies supporting sustainable agriculture

Vietnamese policies related to agriculture are driven by the direction set by the Vietnamese Communist Party (VCP), often in resolutions of the Party's Central Committee. Following the Party's direction, the Government of Viet Nam formulates relevant national policies and action plans, while ensuring that these policies strictly follow the Party's direction and contribute to sustaining its socio-political stability. Over the past four decades, the agricultural policies in Viet Nam have prioritised the intensification of rice production. Likewise, the sector has been fundamental to the VCP's socio-political stability, industrialisation, and modernisation since 1986. In recent years, the VCP has recognised that the sector has been slowed down due to unsustainable practices leading to decreased productivity and overreliance on smallholder households. Besides, international commitments together with support from foreign donors have recently helped increase the awareness of Vietnamese government towards longer-term sustainability considerations (Tran et al., 2021).

In the time of globalisation and integration, Viet Nam aims to develop agriculture on a green, low-emissions foundation to contribute to realising its commitment to carbon neutrality by 2050.

Directions on developing the agriculture sector set by the VCP include Resolution No.19-NQ/TW adopted by the Party's Central Committee on "Resolution on agriculture, farmers and rural areas by 2030, vision to 2045" at the 5th meeting of the Party's 13th Central Committee on 16 June 2022. This new resolution aims to improve the living standards of farming households, putting farmers at the centre of the development process. It focuses on the promotion of stakeholders' engagement in the transition towards sustainable agriculture, and highlights the importance of using digital/technical advances in agricultural production, with a focus on increasing product values.

In line with the Party's direction, the key policies supporting the transition towards sustainable agriculture are summarised in (Table 2).

Table A2. Key policies enabling sustainable agriculture in Viet Nam

Policy	Goal	Resolution/ Decision
Resolution of the Vietnamese government on sustainable and climate-resilient development of the Mekong River Delta	This resolution is known as the ‘golden resolution’, which calls for a transition towards sustainable development and climate change-resilient agriculture in the delta, building on the region’s natural advantages, low impact, and less negative intervention in the environment.	Resolution No. 120/NQ-CP on 17 November 2017
National Target Programme for New Rural Development for the 2021–2025 period	The programme focuses on building new-style countryside, improving rural residents’ material and spiritual life, promoting gender equality, developing a complete and modern socio-economic infrastructure in rural areas, ensuring a green, clean, beautiful, and safe environment and landscape, and boosting traditional culture preservation, climate change adaptation, and sustainable development in the areas. The programme aims to mobilise capital resources of US\$ 105 billion during 2021–2025.	Decision No. 263/QD-TTg on 22 February 2022 Approving the national target programme on new rural areas for the period of 2021–2025
National Strategy for Sustainable Agriculture and Rural Development for the period of 2021–2030, Vision to 2050	Promote sustainable agricultural production and ensure food security, while protecting the environment. It includes provisions for the promotion of organic farming, the development of sustainable livestock production systems, and the conservation of biodiversity.	Decision No. 150/QD - TTg on 18 January 2022
National Strategy on Green Growth from 2021–2030	An important policy to realise sustainable development, directly contributing to reduction of greenhouse gas emissions towards a carbon-neutral economy in the long term.	Decision No. 882/QD-TTg National Action Plan on Green Growth for the 2021–2030 on 22 July 2022
National Action Plan (NAP) to implement the 2030 Agenda for Sustainable Development	The policy includes the 17 SDGs of Viet Nam towards 2030, including 115 specific targets, corresponding with global SDGs targets which were approved at the UN Summit on Sustainable Development in September 2015. The SDG NAP shows the government’s committed effort to implement Viet Nam’s SDGs.	Decision No. 622/QD-TTg on 10 May 2017
National Strategy on Environmental Protection 2021–2030	The overall aim of the strategy by 2030 is to: prevent the increasing pollution trend and environment degradation; solve urgent environmental issues; and gradually improve and restore environmental quality; prevent biodiversity decline; increase capacities in climate change response in an active manner; ensure environmental security; develop models of circular economy, green economy, low carbon; and strive to achieve the country’s 2030 sustainable development goals.	Decision No. 450/QD-TTg on 13 April 2022
National Biodiversity Strategy and Action Plan 2021–2030	Policy guidance and a roadmap for government agencies to conserve biodiversity, promote climate change adaptation, ensure the sustainable use of natural resources, and provide for the equitable sharing of benefits generated from ecotourism, the harvest of non-timber forest products, and payment for forest services, for the next decade in Viet Nam.	Decision No. 149/QD-TTg on 28 January 2022

National Strategy for Climate Change until 2050	Includes targets for transforming the agricultural sector into smart and adaptable to climate change; developing sustainable agriculture, forestry and fisheries value chains; and ensuring food security.	Decision No. 896/QĐ-TTg on 26 July 2022
National Climate Change Adaptation Plan (NAP) for the period 2021–2030, with a vision to 2050.	The Ministry of Natural Resources and Environment (MONRE) is assigned to take the lead in supervising and monitoring implementation of the climate NAP. The plan contains an Annex with concrete tasks to be completed by 2025 and 2030, which are categorised as: management of state and resources; agriculture; natural disaster prevention; environment and biodiversity; water resources; infrastructure; and public health, labour, society, culture, sports, and tourism.	Decision No. 1055/QĐ-TTg on 20 July 2020

d) Institutional framework steering sustainable agriculture

Drawing from the legislative framework governing sustainable agriculture in Viet Nam,

several central government agencies are involved in agriculture production, sustainable development, and natural resource management. The relevant responsibilities of these agencies are outlined in Table A3.

Table A3 State institutions of Viet Nam: Function and relevance to sustainable agriculture

INSTITUTION	KEY FUNCTIONS	RELEVANCE TO SUSTAINABLE AGRICULTURE
Ministry of Agriculture and Rural Development (MARD)	MARD performs state management functions in the fields of agriculture, forestry, salt production, fishery, irrigation/water services, and rural development nationwide.	MARD has been responsible for state management of crop, livestock, forest, and fishery resources since the unification of Viet Nam in 1975. Therefore, MARD is the key agency that has observed and experienced the transformation of state management of natural resources over the past four decades.
Ministry of Natural Resources and Environment (MONRE)	MONRE Performs national-level administration of laws and policies related to land, water, geology and minerals, environment, hydrology and meteorology, climate change, survey and mapping, and marine waters and islands; likewise responsible for the management of natural ecosystems, aside from forests, including development and management of natural conservation areas in wetlands and limestone ecosystems.	MONRE is the newly established ministry of which provincial/district level capacities and resources under its technical administration are immature and mainly focused on Land Administration rather than implementing environmental management policies. Environmental data informing on the state of MONRE's focused themes are rather weak and disperse. Recently, MONRE has been assigned to the tasks of developing and maintaining Viet Nam's environmental databases. These are relevant for monitoring environmental impacts of agricultural production.

Ministry of Planning and Investment (MPI)	Responsible for national-level planning and investment including that for agricultural production, environmental protection, biodiversity conservation, socio-economic planings. Includes the General Statistics Office, responsible for the monitoring of socio-economic developments and management of national statistics (including agriculture sector).	From a governance perspective, MPI has higher influence on decision-making on natural resources and socio-economic development planings in Viet Nam than MARD and MONRE since it is the focal point of ten-year provincial planings (including socio-economic development and use of natural resources). MPI serves as a key implementer of the S DGs and Green Growth, which are the two primary policies guiding the sustainable development of the agriculture sector in accordance with global frameworks such as the UN SDGs.
Ministry of Finance (MOF)	MOF has the function of managing the State's finance (budget, tax, fees, and other revenues of the State budget, national reserve, State financial funds, financial investment, corporate finance; cooperative finance and collective economy; and others.)	Regarding sustainable agriculture, MOF is responsible for allocating funding and budget for sustainable agriculture projects and programmes, developing tax policies and tax incentives supporting sustainable agricultural practices, and regulating financial institutions that provide credits to the agriculture sector.
Provincial People's Committee (PPC) (including technical departments)	Responsible for province-level budgeting, ensuring adherence to the constitution, national laws, and resolutions of the People's Council at the provincial level. They are also tasked with implementing socio-economic development policies for which they develop master plans for socio-economic and sectoral development. PPCs are responsible for agriculture and natural resource management at the provincial level.	Due to the increasing decentralisation of decision making over natural resources, following <i>Doi Moi</i>, a province can now be Viet Nam's decision-making representative unit in terms of state management.

3. Governance challenges

The current legislative and institutional frameworks enabling sustainable agriculture transition present major challenges, among them:

- **Limited concern over environmental sustainability.** Despite efforts made in policy reforms, the current legislative and institutional frameworks reveal a lack of concern over the environmental sustainability aspect, especially the problems of biodiversity loss and ecosystem degradation.
- **Overlapping legal framework.** Due to the traditional sectoral approach to natural resource management, the lack of cross-jurisdictional coordination between relevant ministries often resulted in both gaps and overlaps in the legal framework and ministries. For instance, while MARD is responsible for agricultural development (rice, corn, and others.), MONRE is responsible for state management of cultivated land as well as the environmental impacts of agricultural practices. In practice, these two agencies rarely collaborate. When jurisdictional boundaries overlap, sectoral policies are often inconsistent. Weak horizontal coordination happens also within each ministry (for example, between the Department of Crop Production and VNFOREST, leading to policies supporting deforestation for agricultural development). These issues hinder the effectiveness of integrated policies and projects (including those supporting sustainable agriculture).
- **Weak enforcement of regulations.** The overlapping legal framework, lack of

coordination between central agencies, as well as an increasing decentralisation of management responsibilities to provincial government, have led to gaps in the implementation and enforcement of regulations related to sustainable agriculture, which can lead to unsustainable practices and environmental degradation.

- **Land use conflicts.** There are often conflicts over land use among farmers, Indigenous communities, and commercial developers. These conflicts can lead to unsustainable land use practices and the displacement of communities.
- **Restricted/limited access to resources.** Many smallholder farmers and local communities lack access to the resources needed to adopt sustainable agricultural practices, such as financial resources, technology, and knowledge.

4. Conclusions and recommendations

Based on the preceding analyses and findings, current agricultural practices are apparently unsustainable in Viet Nam. To remain one of the world's top exporters of agricultural commodities, Viet Nam will have to restructure its agriculture sector to sustain efficiency of production and use of limited cultivated lands, as well as enhance nutrient input efficiency and reduce environmental impacts. The case study presents the following key messages:

- **Strengthen leadership and political will** of the Vietnamese Communist Party leadership towards supporting sustainable transition. While leaders' value priorities remaining focused on rapid growth and infrastructure development, sustainable transitions are mainly influenced by foreign actors with funding and technical support. This has led to an overlapping legal framework with ad hoc policies and consistent lack of cross-jurisdictional coordination in implementing sustainable agriculture policies.

- **Integrate agricultural policies into sustainable development strategy.** the Viet Nam's sustainable development strategy (led by MPI) provides a relatively comprehensive framework supporting sustainable agriculture. It has also developed key indicators to measure the progress of sustainable development in response to UN SDGs, linked to national socio-economic statistics (also managed by MPI). The integration process requires cross-jurisdictional coordination between MPI, MARD, and MONRE, with MPI being the leading agency. While recent concerns over environmental aspects of Viet Nam's development have drawn attention to supporting MONRE financially and technically, future sustainable agriculture initiatives should account for the problems of lacking capacities within MONRE (including capacities for influencing higher decision-making levels).
- **Strengthen capacity for effective implementation of regulations.** With traditions that tend to favour speeding up processes (Ruddle, 1998), Viet Nam's agriculture production is no different. Effective implementation of transitional frameworks requires collaboration between sectors, leadership from the central government to ensure that strategic objectives are met in the process, sufficient budgets and resources, monitoring and evaluation, and meaningful participation of the private sector and smallholder farmers.
- **Raise awareness of the need for transition and sustainability.** Besides the need to provide training for farmers on sustainable agriculture practices, it is also necessary to increase the awareness of the country's political leaders and ministries.
- **Promote participation of smallholder farmers.** In addition to small and scatter plots, farmers often state that they have limited access to government subsidies and support (Tung et al., 2022). Therefore, gaining

the support and participation of farmers is a long-term process which requires local institutions to help smallholder farmers gather together and be connected to available government support. In the *Doi Moi* process, agriculture cooperatives were dismantled. To facilitate the transition to sustainability, introducing appropriate new forms of agriculture cooperatives may be beneficial for helping increase participation of and collaboration among farmers.

- **Supporting the use of technologies in agriculture production:** Precision agriculture (PA) technology provides a promising tool to improve production efficiency and labour productivity, as well as minimise the use of synthetic fertilisers and pesticides. At the same time, adoption of this technology to small plots and fragmented agricultural land is a special challenge.



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