2022 Update

From Global Commitments to National Action:

A Closer Look at Nationally Determined Contributions from a Food and Land Perspective

The Food and Land Use Coalition

CORE PARTNER
UN Sustainable Development Solutions Network

Acknowledgments

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Additional analysis and resources are available on the FOLU and FELD websites, as well as related analysis on net zero strategies conducted by the FABLE Consortium. Please click **here** to sign up to FOLU's newsletter to receive updates, and **here** to contact the FELD Team.

The content and opinions expressed herein are those of the authors and do not necessarily reflect the views of the associated and/or supporting institutions. The usual disclaimer applies.

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NDCs reviewed under the 2022 Update

G20 countries

- Argentina
- Australia
- Brazil
- Canada
- China
- European Union
- India
- Indonesia
- Japan
- Republic of Korea
- Mexico
- Russian Federation
- Saudi Arabia
- South Africa
- Türkiye
- United Kingdom
- United States of America

Non-G20 countries

- Colombia
- Democratic Republic of Congo
- Egypt
- Ethiopia
- Ghana
- Kenya
- United Arab Emirates

Cover: Photograph taken by Noor Santosian, a Kenyan environmental conservationist. The photo illustrates the harsh agricultural conditions for farming communities in a region already experiencing severe impacts of climate change, affecting millions of people across the Horn of Africa during the fourth consecutive year of severe drought (Reliefweb, OCHA/UN).

About the 2022 update

This brief summarises the expanded analysis of Nationally Determined Contributions (NDCs) by the Food, Environment, Land and Development (FELD) Action Tracker team at the UN Sustainable Development Solutions Network (SDSN), on behalf of the Food and Land Use Coalition (FOLU). It updates a first analysis issued in 2021 and now covers 24 NDCs, for 50 countries including the EU and all G20 members, FOLU partner and additional countries that together represent about 80% of global greenhouse gas emissions.

The purpose of this brief is to provide policymakers and other interested parties at global level and in countries with a systematic analysis and cross-read of current NDCs from a food and land use perspective. Specifically, the team mapped NDC commitments and references against FOLU's Critical Transitions, and assessed NDCs for their focus on action and national policy follow up. A high rating of NDCs in this desk review, however, does not imply advances in implementation – something to be assessed separately together with experts at country level. FELD's analysis of NDC documents and official communications was undertaken to inform global level discussions and the global stocktake, as well as a basis for direct engagement with national stakeholders as part of FOLU's dialogue on national action agendas.

This 2022 Update replaces the brief issued one year ago, and builds on it by:

- **updating** and refining its assessments on the basis of latest NDC updates, with clearer criteria and a stronger focus on actionable elements for the delivery of national commitments;
- **expanding** the set of countries and NDCs to a total of 24 (from the earlier 15), by including all remaining G20 members and additional countries in Sub-Saharan Africa and the Middle East;
- **broadening** the consideration of NDC statements related to adaptation and financing, both key issues not only for global discussions but for NDC operationalisation in countries; and
- **integrating** elements of valuable NDC analyses conducted by other organisations and initiatives.

The country-specific details of FELD's analysis will be available alongside this brief on the online platform of the FELD Action Tracker at FELDactiontracker.org.

https://feldactiontracker.org/

About the FOLU Coalition and the FELD Action Tracker

The Food and Land Use Coalition

The Food and Land Use Coalition (FOLU) is a global community of country platforms, partner organizations and Ambassadors working to advance sustainability, equity and resilience in food and land use systems. Created in 2017, FOLU supports diversity, embraces disruptive thinking and forges consensus through an evidence-based approach. The coalition empowers farmers, policymakers, businesses, investors and civil society to unlock collective action at scale.

FELD Food, Environment, Land and Development ACTION TRACKER

The Food, Environment, Land and Development (FELD) Action Tracker is a strategic FOLU initiative led by the UN Sustainable Development Solutions Network (SDSN) to undertake systematic analyses of national policies, identify good policy practices for cross-country learning, and help catalyse accelerated, ambitious policy action in countries. FELD builds on the work of FOLU country platforms and members of the Food, Agriculture, Biodiversity, Land Use and Energy (FABLE) Consortium.

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Contents

Acronyms and abbreviations

AFOLU	Agriculture, Forestry, and Other Land Use
COP	Conference of Parties; references include those COP26 (2021), and COP27 (2022)
FABLE	Food, Agriculture, Biodiversity, Land Use and Energy Consortium
FELD	Food, Environment, Land and Development (Action Tracker)
FOLU	Food and Land Use Coalition
GAFF	Global Alliance for the Future of Food
GHG	Greenhouse gas
ICTU	Information necessary for clarity, transparency, and understanding (UN)
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land use, land-use change and forestry
$MtCO_2e$	Metric tons of carbon dioxide equivalent
NDC	Nationally Determined Contribution
REDD+	Reducing Emissions from Deforestation and forest Degradation (+)
SDGs	Sustainable Development Goals
SDSN	Sustainable Development Solutions Network
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute

Executive summary

When COP26 ended in November 2021 with the adoption of the Glasgow Climate Pact, it was clear to everyone: in spite of progress, the combined commitments made by countries for 2030 fell far short of what was needed to reach the global target to limit global warming to 2°C, let alone 1.5°C. This was still the case when the modellers assumed the full delivery and implementation of pledges (a highly unrealistic assumption for many), and when including additional sectoral pledges, net zero and other longer-term commitments. The Climate Action Tracker estimated that global warming would increase to 2.4°C - almost a full degree above the Paris target. This was confirmed more recently in the 2022 UNEP Emissions Gap Report (UNEP 2022).

Over the past year, however, only a fraction of countries revisited their 2030 plans and targets, doing so against the background of growing geopolitical crises and macro-economic challenges. Meanwhile researchers of the Intergovernmental Panel on Climate Change (IPCC) have further reinforced the evidence and need for fundamental shifts to start this decade (UNFCCC 2021a). In the face of this, momentum for ambitious action before 2030 seems to be stalling, even as the number of countries (and companies) announcing new net zero strategies keeps rising.

Action on agriculture, food and land use is critical both in the near and for the long term: roughly one third of global net greenhouse gas emissions are estimated to emanate from food systems and related land use. They also drive around 80% of biodiversity loss and consume 70% of our fresh water. Their transformation is therefore not only important for addressing climate change but also for the protection of biodiversity and the achievement of the Sustainable Development Goals (SDGs). And while there is growing scientific evidence and recognition on what is needed to initiate the various critical transitions, attention (and action) from national policymakers has so far been limited (UN 2021a; UN 2021b; FELD 2021; GAFF 2022a; Climate Action Tracker 2022).

The FELD (Food, Environment, Land and Development) Action Tracker was developed as a strategic initiative under the Food and Land Use Coalition (FOLU) to track and systematically assess progress on national policies and their implementation, including a closer look at NDCs, their commitments, targets and various domestic policies and plans needed to operationalise them.

The 2022 Update of FELD's systematic analysis of NDCs is framed by a global call for action and a focus on the "practicalities of implementation", as emphasised by the COP27 Presidency (the Guardian 2022; Relief Web 2022). Expanding its critical look from the original 15 in 2021 to now 24 NDCs – covering 50 countries including all G20 members – this FOLU brief provides a critical reality check and window into the state of national climate, food, and land use agendas. The majority of NDCs covered by this analysis were recently updated (since 2020) or newly included (since COP26). Together, they represent around 80% of greenhouse gas (GHG) emissions, including the largest emitters (China, the US, and the EU), highly forested countries (Brazil, Indonesia, the Democratic Republic of the Congo) and a larger set of countries in Sub-Saharan Africa (Ghana, Kenya, Ethiopia) which already experience the effects of a warming planet and underline the need for urgent adaptation action.

Overall, the findings of this analysis are sobering: seven years after the Paris Agreement, countries still do not sufficiently and consistently include emissions from, and actions for, their food and land sectors. Many of the world's largest emitters have yet to align their policy action with their actual emission profiles, and consider especially the need for shifts toward sustainable diets and consumption, and to address food loss and waste. While commitments and references to nature and agriculture are frequent, the extent to which they are substantiated by relevant policy action varies greatly, however. Assessed against FOLU's framework of the 10 Critical Transitions (FOLU 2019) toward sustainable food and land use systems, only a fraction of NDCs consistently identify the most promising evidence-based areas for intervention, especially for demand-side shifts toward healthy and sustainable diets, and system-level action to reduce food loss and waste.

On the positive side of this assessment, it has to be noted that many NDCs identify priority areas in the agriculture, food, and land sectors as an important contribution to national mitigation targets, or to adaptation goals with mitigation co-benefits. Welcome is the growing attention to adaptation in the NDCs, including concrete activities and programmes related to agriculture, food, and land use. Relevant actions in the NDCs are mostly directed at the development of productive and regenerative agriculture, the protection of nature, and the enhancement of broader enabling conditions such as the consideration of gender and access, as well as the improvement of rural livelihoods.

Of continued concern, however, are the findings that point to the limited focus of NDCs on action, implementation, and domestic policy follow-up to back up headline NDCs commitments. This includes the failure by many NDCs to substantiate what and how they plan to achieve the commitments made, and the operational context for cross-sectoral implementation. In contrast to other sectors like transport, only very few NDCs set sectoral targets for Agriculture, Forestry, and Other Land Use (AFOLU). These and additional findings from the analysis point to the considerable scope – and urgency – for improvement:

- **Only a third of NDCs** back their commitments with concrete policy measures for AFOLU;
- **Fewer than half of the NDCs** provide some form of targets for the AFOLU sector, and only four of them include specific targets for the reduction of emissions from the sector;
- **Only one in five NDCs** includes financial information regarding the tentative costs, budget requirements, and sources of funding of proposed policy actions on AFOLU; and
- **Fewer than half of the NDCs** specify countries' needs for technology development, transfer, and capacity building to achieve meaningful food and land use transformation.

Against this background, the examples and commitments set by some countries are particularly encouraging. Among them…

Ethiopia's ambitious mitigation targets for both the agriculture and land use, land-use change and forestry sectors, broken down into specific actions across different subsectors;

The Democratic Republic of Congo's commitment to the promotion of REDD+ programmes to restore and conserve its forests and secure global carbon removals;

The UK's wide-ranging list of policies developed to operationalise its NDC commitments related to food and land systems, including practical emission reductions in food storage and distribution;

Indonesia's recently enhanced commitment with ambitious initiatives related to forest management; and

The United Arab Emirates' ambitious programmes for farming and the protection and restoration of its mangroves, backed by purposeful national policies and programmes.

These examples are inspiring, and together with the prospect of sharing future implementation experiences are also **important opportunities for joint policy learning** about implementation challenges but also opportunities and practical solutions to transform complex food and land use systems across different countries and contexts.

NDCs vary greatly in their format, focus, length and intended function. While some set clear policy directions and communicate sectoral priorities, at times even in great detail, and are based on elaborate processes, others are much more limited. Overall, NDCs should not be equated with "national climate plans" as they frequently are, including by the United Nations. Their pledges and targets cannot replace national planning processes to identify the intersectoral policies and programmes needed to decarbonise and transform national systems (UN 2022). NDCs for 2030 do provide important directions but more work is needed in countries to translate ambition into plans that can guide actual operationalization, financial allocations, programmatic implementation, coordination and cross-sectoral action. For future NDCs, countries will have to provide consistent information necessary for clarity, transparency, and understanding (ICTU), so far only optional, and need to follow ICTU guidance when preparing their second NDC in 2025. This will also facilitate better comparability and ultimately, national and global accountability.

The review of 2030 NDCs by FELD and a growing number of other independent analyses, underline the need for all countries – developed and developing – to go beyond pledges, commitments, and targets. This does not mean that NDCs need to be expanded through the inclusion of implementation-related details in order to turn them into strategic and operational plans. Instead, countries need to complement their NDCs with strategies and roadmaps that emerge from whole-of-government planning processes to operationalise the commitments and targets, establish cross-sectoral mechanisms to coordinate implementation and financing, including from external sources.

State Parties need to systematically consider and include aspects of **international trade and spillover effects** of their demand and imports of food commodities in their NDCs and food-related mitigation actions. Supply chains especially of developed countries drive deforestation and GHG emissions in other countries and regions. Actions in NDCs need also be updated and aligned with countries' endorsements of recent forest-related initiatives at COP26 - and COP27.

The alignment of NDCs and their commitments for this decade with evidence-based longer-term pathways to reach net zero by mid-century, is critical. Near- and long-term commitments and plans, currently developed separately and involving different sets of actors for different purposes, will need to emerge from the same evidence-based national platforms. For 2030, the NDCs developed since 2020 provide a shaky basis at best. It is important that the lessons from this experience inform the design of future NDCs to enhance, ratchet up and make up lost time, including by accelerating the transformation of food and land use globally.

The ultimate achievement of the Paris Agenda for carbon neutrality by mid-century and the effective limitation of global warming to prevent the most catastrophic impacts of climate change will depend on countries to develop integrated national pathways that reflect their specific emission profiles and sequestration potentials. The role of AFOLU sectors in net zero pathways, and the respective policy choices countries are facing, are subject to related work under the FABLE Consortium (and a parallel FOLU publication, FABLE 2022).

1. Why do NDCs need a closer look from a food and land use perspective?

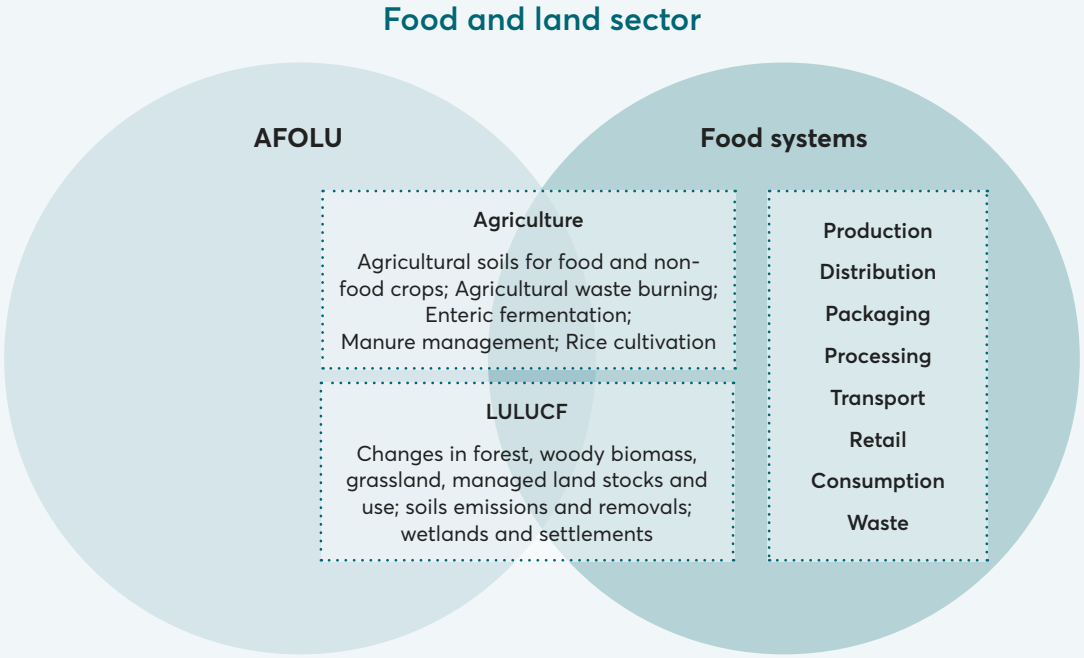
The 27th Conference of the Parties (COP27) in Sharm El-Sheikh will convene in November 2022 and try to build on COP26 one year earlier in Glasgow. Nationally Determined Contributions (NDCs) will be a critical aspect and benchmark for the progress made over the past 12 months – but also be questioned for their role and potential to drive action.

NDCs are central and critical strategic policy documents under the Paris Agreement, for Parties to outline and communicate their post-2020 climate targets and actions. Through their NDCs, countries define their contributions to the collective targets – and explain why these are fair and ambitious considering national circumstances. Parties were invited to submit updated NDCs by 2020 and every five years after that.

Already at COP26, the **analysis by a range of initiatives** and experts found that NDCs and the national efforts they communicated were insufficient (not ambitious enough) to achieve the goal of the Paris Agreement (Den Elzen et al. 2021). The decision taken at COP26, entitled the Glasgow Climate Pact, therefore, "requested" that countries "revisit and strengthen" their climate pledges by the end of 2022 (UNFCCC 2021a). As of October 2022, however, only about 20 out of 194 Parties have submitted an updated NDC post-COP26. With the latest NDCs submitted, it is expected that most Parties will only do so again in 2025, for the period of 2030–2035, based on Parties' review of their individual action as well as the collective progress through the Global Stocktake (GST). The GST aims to inform future planning and support countries in designing their next plans (UNFCCC 2021b). The first GST is ongoing since COP26 and will conclude at COP28. What this means is that current NDCs represent the collective ambition for the ongoing decade leading to 2030 – a decade described by the Intergovernmental Panel on Climate Change (IPCC) as critical for halving emissions and carbon neutrality by mid-century (IPCC 2022).

Land use and food systems – responsible for a substantial share of global emissions as well as the world's main sinks for carbon from the atmosphere – lie at the heart of the climate challenge, and thus the global response. As a consequence, related sectors are seen as central to climate action – and therefore should represent an integral part of all NDCs. This includes actions in Agriculture, Forestry, and Other Land Use (AFOLU – see Box 1 for a clarification of related terminology), as well as actions to reduce emissions from broader food systems, meaning beyond food production to also include food processing, distribution, packaging, retail, consumption, and transport. While AFOLU emissions account for roughly a quarter of total net human-induced emissions, the share increases to one third when broader food systems are included (IPCC 2019; Roe et al. 2019; Clark et al. 2020). Importantly, the land sector represents a key element of the solution due to its ability to absorb carbon dioxide (CO_2) in its soil and biomass.

Box 1. Key terms used in this brief and the discussion



The analysis in this brief was undertaken from a perspective of food and land use sectors. The definitions and implications of the terminology used in this brief include:

Agriculture, forestry, and other land use (AFOLU): AFOLU comprises the agricultural sector and Land use, land-use change and forestry (LULUCF). It plays a central role for food security and sustainable development. The main mitigation options within AFOLU involve one or more of three strategies: prevention of emissions to the atmosphere by conserving existing carbon pools in soils or vegetation or by reducing emissions of methane and nitrous oxide; sequestration – increasing the size of existing carbon pools and thereby extracting carbon dioxide (CO2) from the atmosphere; and substitution – substituting fossil fuels or energy-intensive products for biological products, thereby reducing CO2 emissions. Demand-side measures (e.g. reducing loss and waste of food, changes in human diet, or changes in wood consumption) also play a role.

Land use, land-use change and forestry (LULUCF): The subset of AFOLU emissions and removals of greenhouse gases (GHGs) resulting from direct human-induced land use, land-use change, and forestry activities from carbon pools in managed lands, excluding non-CO2 agricultural emissions. Following the 2006 IPCC Guidelines for National GHG Inventories, "anthropogenic" land-related GHG fluxes are defined as all those occurring on "managed land", i.e. "where human interventions and practices have been applied to perform production, ecological or social functions".

Food systems: A food system is all processes and infrastructure involved in satisfying a population's food security; that is, the gathering/catching, growing, harvesting (production aspects), storing, processing, packaging, transporting, marketing, and consuming of food, and disposing of food waste (non-production aspects). It includes food security outcomes of these activities related to availability and utilisation of, and access to, food as well as other socioeconomic and environmental factors. The current food system feeds the great majority of world population and supports the livelihoods of over 1 billion people (Porter et al. 2014; Mbow et al. 2019).

Food and land use sector: AFOLU (agriculture and LULUCF) as well as food systems more broadly.

Source: IPCC 2014; 2018b; 2019.

The central role of food and land use transformation for global climate, nature and development agendas is well documented, including by the Food and Land Use (FOLU) Coalition's Growing Better report in 2019 (FOLU, 2019). It also serves as the basis for the Food Environment Land and Development (FELD) team's mandate to review NDCs as the central strategic documents under the Paris Agreement. As such, NDCs provide opportunities for the FOLU Coalition to gauge the extent that countries recognised the urgency, relevance and opportunity of food and land use transformation – in and across countries, and globally.

This **present 2022 brief** updates the analysis undertaken and published by the FELD Action Tracker in 2021 (FELD 2021). Based on the methodology and approach developed then, the 2022 brief:

- **Updates** and refines the analysis on the basis of latest NDC updates, with clearer criteria and a stronger focus on actionable elements for the delivery of national commitments;
- **Expands** the set of countries and NDCs to a total of 24 (from the original 15), by including all remaining G20 members and additional countries in Sub-Saharan Africa and the Middle East;
- **Broadens** the consideration of NDC statements related to adaptation and financing, both key issues not only for COP27 but also the prospect of NDC operationalization in countries; and
- **Integrates** elements of valuable NDC analyses conducted by other organisations and initiatives, including by the Global Alliance for the Future of Food (GAFF), the World Resource Institute (WRI) and the UN Development Programme (UNDP).

The **objective** of this updated brief remains two-fold: (i) to provide on behalf of the FOLU Coalition an analysis of how updated and new NDCs approach food- and land-related challenges (and opportunities), based on FOLU's 10 Critical Transitions framework (FOLU 2019); and (ii) to explore and assess how action-oriented NDCs are according to their various policy and operational indications. The brief extracts critical observations, patterns, and lessons not just for future NDCs but more broadly on the directions and priorities of national action needed to advance toward food and land use transformation as part of the global climate emergency the world is facing.

Scope of the 2022 Update and FELD analysis

The FELD team systematically reviewed **updated NDCs from 24 State Parties** to the UNFCCC (23 countries plus the European Union of 27 members), across all continents and income groups (Table 1 and more information in Annex A). While not politically representative the sample includes the world's largest emitting countries and major economies as organised in the G20 (including FOLU partner countries China, India and Indonesia); key emerging economies (including FOLU's other partner countries in Colombia, Ethiopia, and Kenya); and additional African and Middle Eastern countries, including Egypt and the United Arab Emirates (hosts of COP27 and COP28, respectively), the Democratic Republic of Congo (DRC, a highly forested country in the Congo basin), and Ghana. Overall, the expanded set of 24 NDCs represents a total of 50 countries and about 80% of global GHG (ClimateWatch 2022, Annex B).

Within this set, **emissions from the AFOLU sector vary greatly:** in the DRC, AFOLU represent more than 90% of the national emissions profile, in other countries less than 1% (FAO 2022 in Annex B). By limiting this analysis to 24 NDCs, and within these to the G20 and a small number of developing and emerging economies, the results are likely to reflect a bias and missed many interesting aspects from the NDC submissions of more than 100 other, including small and especially vulnerable countries.

The analysis of NDCs was limited to **desk reviews of the original documents** in their original, French, Spanish or English language as submitted to, and on the website of, the UNFCCC. Current NDCs are at different stages of development, spanning from first NDCs, to updated and second NDCs. While this set cannot be considered representative for the world, it covers a significant part of the challenge and the analysis sheds light on key aspects related to countries' recognition and action related to the food and land use sector.

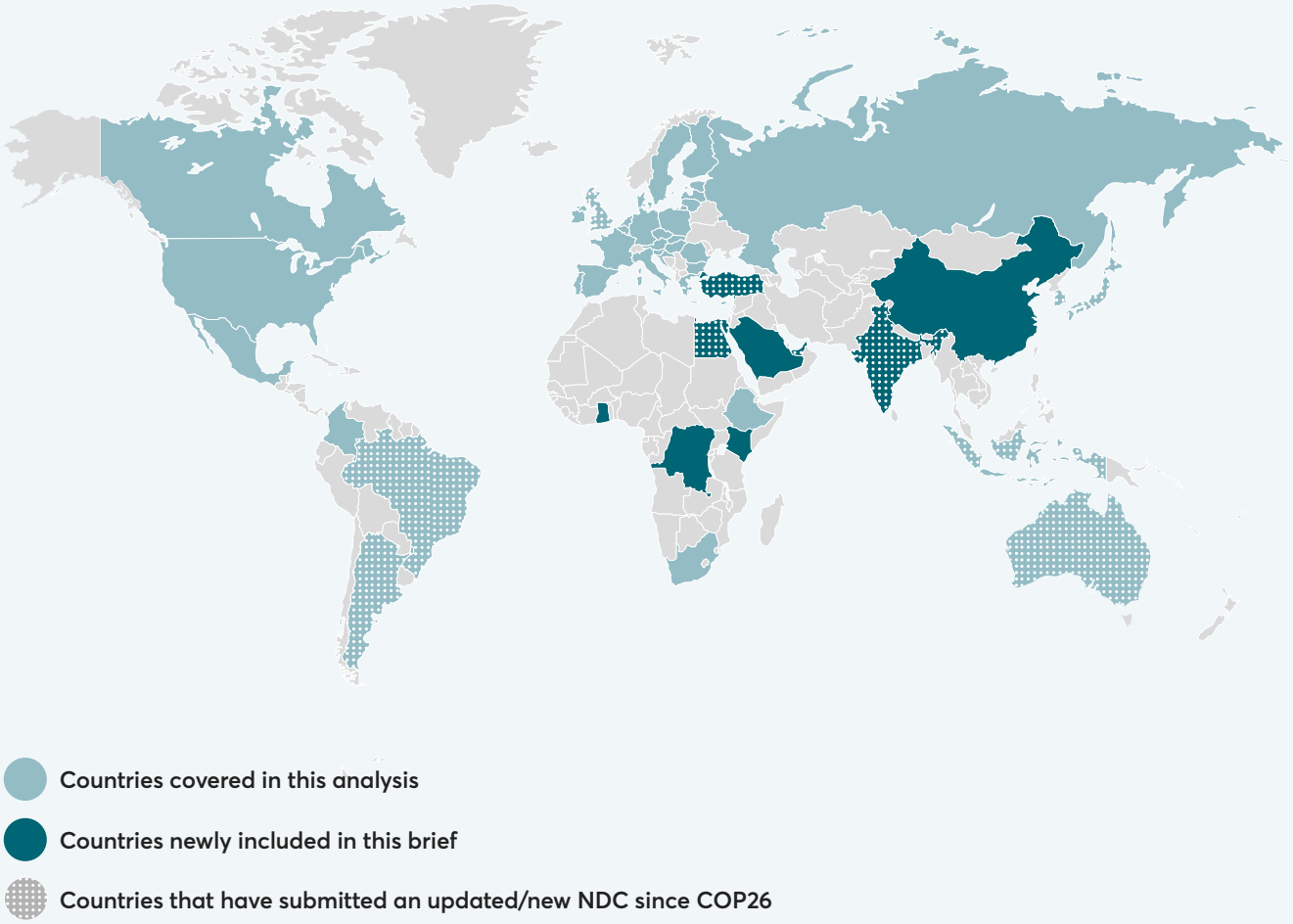
Finally, the main approach reflected in this analysis and brief is one of joint learning and dialogue around the state of climate action at both global level and in countries. For this reason, the FELD team and FOLU did not opt for a name-and-shame approach on the basis of scoring NDCs according to fixed criteria. Instead, this brief undertook a systematic analysis based on clear criteria and highlights notable country examples regarding their approach to food and land use.

Table 1. Status of NDCs reviewed for the 2022 update

COUNTRY	Reference	Status (UNFCCC)	Date	Analysis in this brief
Argentina	ARG2021	Second NDC (updated submission)	November 2021	Updated since the 2021 analysis
Australia	AUS2022	2022 updated submission	June 2022	Updated since the 2021 analysis
Brazil	BRA2022	First NDC - second update	April 2022	Updated since the 2021 analysis
Canada	CAN2021	First NDC (updated submission)	July 2021	No development since COP26
China	CHI2021	First NDC (updated submission)	October 2021	Newly included
Colombia	COL2020	First NDC (updated submission)	December 2020	No development since COP26
Democratic Republic of the Congo (DRC)	DRC2021	First NDC (updated submission)	December 2021	Newly included
Egypt	EGY2022	First NDC (updated submission)	July 2022	Newly included
Ethiopia	ETH2021	First NDC (updated submission)	July 2021	No development since COP26
European Union	EU2020	First NDC (updated submission)	December 2020	No development since COP26
Ghana	GHA2021	First NDC (updated submission)	November 2021	Newly included
India	IND2022	First NDC (updated submission)	August 2022	Updated since COP26; newly included
Indonesia	IDN2022	Enhanced NDC	September 2022	Updated since the 2021 analysis
Japan	JAP2021	First NDC (updated submission)	October 2021	Updated since the 2021 analysis
Kenya	KEN2020	First NDC (updated submission)	December 2020	Newly included
Republic of Korea	ROK2021	First NDC (updated submission)	December 2021	Updated since the 2021 analysis
Mexico	MEX2020	First NDC (updated submission)	December 2020	No development since COP26
Russian Federation	RUS2020	First NDC	November 2020	No development since COP26
Saudi Arabia	SAU2021	First NDC (updated submission)	October 2021	Updated since the 2021 analysis; newly included
South Africa	SA2021	First NDC (updated submission)	September 2021	No development since COP26
Türkiye	TUR2021	First NDC	October 2021	Newly included
United Arab Emirates (UAE)	UAE2022	Updated second NDC	September 2022	Updated since the 2021 analysis; newly included
United Kingdom	UK2020, UK2022	Updated 2030 NDC	September 2022	Updated since the 2021 analysis
United States	USA2021	First NDC (after re-joining the Paris Agreement)	April 2021	No development since COP26

Additional information and resources can be found in the annex and on the FELD web platform.
Source: authors as per UNFCCC NDC Registry (UNFCCC 2022a)

Countries that submitted updated NDCs before Oct 2021



This brief updates the 2021 version, with slight changes in the sequence of the findings and organised as follows: Chapter 2 reviews the content of NDCs for commitments, targets, specific policy actions and interventions related to food and land use; Chapter 3 explores the extent to which NDCs are indicative of a focus on action and conducive to effective policy implementation, intersectoral and institutional follow up; and Chapter 4 provides observations, lessons, and an outlook. A short overview of the applied methodology and approach can be found in the annex, alongside additional information on the analysed NDCs and relevant emission data.

Recent other NDC analyses and their key findings are integrated and referenced throughout this brief where relevant, including by the Global Alliance for the Future of Food (GAFF 2022a; 2022b); the World Resources Institute (WRI; Dixit et al. 2022); and the UN Development Programme (UNDP 2022). For analyses of the quantitative targets and actions in the NDCs, the Climate Action Tracker remains the main resource. The UNFCCC's main mandated synthesis report of all NDCs (UNFCCC 2022b) provides further systematic analysis but was not available in time before the finalisation of this brief.

2. What policies, actions and priorities are included in current NDCs?

Based on FELD's 2021 analysis and the feedback from experts and partners, the FELD team refined its original methodology for a **critical content review** of current NDCs (Annex C), consisting of two assessments: In the first, summarised in this chapter, the original texts were analysed for commitments made in the NDCs, including targets and policy initiatives related to food and land use, mapped against FOLU's Critical Transitions framework, as outlined in its 2019 Growing Better report (FOLU 2019; see also Box 2).

FOLU's Critical Transitions represents a valuable framework related to food and land use and was found to provide a solid basis for capturing the range of policy interventions and adjustments needed for systemic transformation. Not all 10 Transitions and associated interventions are relevant for and needed in the same way everywhere; but in different configurations they can be matched with local circumstances and needs.

Given the **relevance of local and national context,** FELD applied the framework not as a strict "checklist" to score and rank NDCs but rather as a basis for mapping NDC content, and to identify gaps and opportunities, as well as notable country examples. Importantly, this framework allows for the consideration of not just narrow (technical) interventions for climate mitigation and adaptation, but of broader related action on biodiversity, sustainable development, and social justice.

These important system-level transitions, including their **associated policy areas and "essential actions"** (see Table C.1 in the Annex) were developed on the basis of existing research and evidence of their positive impact and effects for climate mitigation, the protection and restoration of biodiversity, the promotion of healthier diets and food security, and the creation of more inclusive rural economies (Strassburg 2020).

Box 2. FOLU's Critical Transitions Framework

Deep system-level changes are needed to meet the interrelated challenges of the global climate, nature and development crises: more sustainable ways to reconcile competing demands for land and other natural resources, manage agricultural systems, produce and consume food, protect and restore nature, in order to permanently lower emissions from these sectors and enhance natural sinks, reverse the loss of biodiversity and improve the livelihoods of communities. Achieving this requires hard choices in most countries and sustained, tangible policy action by governments and other actors. As part of the Growing Better report, the FOLU Coalition developed a framework of 10 transitions deemed critical for the transformation of food and land use systems globally.

1. **Promoting healthy diets:** Global diets need to converge towards local variations of the "human and planetary health diet" in line with latest nutritional science, involving a predominantly plant-based diet with more protective foods, a diverse protein supply, reduced consumption of sugar, salt, and highly processed foods.
2. **Scaling productive and regenerative agriculture:** Agricultural systems are both productive and regenerative and combine traditional techniques, with advanced precision farming technologies which support more judicious use of inputs.
3. **Protecting and restoring nature:** The conversion of forests and other natural ecosystems for food production must end and countries should invest massively in restoration at scale.
4. **Securing a healthy and productive ocean:** Sustainable fishing and aquaculture are needed to deliver increased supply of ocean proteins, reducing the demand for land, and supporting healthier and more diverse diets.
5. **Investing in diversified sources of protein:** Human protein supply should be diversified to include aquatic, plant-based, insect-based, and laboratory-cultured proteins.
6. **Reducing food loss and waste:** It is estimated that up to one third of the total food produced might get lost or wasted. Solutions to this challenge depend on national system-focused strategies, including regular reporting on reduction targets for public and private sector actors, accelerated business innovation, and campaigns for behavioural change.
7. **Building local loops and linkages:** Efforts to improve the efficiency and sustainability of local food systems and economies, especially in cities and town should include public procurement for food within cities and peri-urban areas, limited competition for land in peri-urban areas, and investment in local infrastructure.
8. **Harnessing the digital revolution:** The digitalisation of systems to run and manage food and land use has the potential to support producers and consumers and their choices, including to connect them to the value chain.
9. **Delivering stronger rural livelihoods:** The transformation of food and land systems must be achieved in a just and equitable manner, providing benefits to rural communities, and allowing them to adapt to new challenges, protect and regenerate natural capital and invest in a better future.
10. **Improving gender equality and accelerating the demographic transition:** Equal access to resources, such as land, labour, water, credit, and other services, must be central to policies.

Source: FOLU 2019.

The FELD team conducted **detailed content reviews** for all elements in the 24 original NDC documents that relate to food and land issues, including relevant policy initiatives, reforms, and interventions. Slight adjustments in the methodology and clarifications in the terminology were made based on feedback received for the 2021 FOLU brief (see also Annex C).

The analysis did not involve any in-country experts, interviews or cross-checking of actual action and implementation progress in countries. The general discrepancy between the policies, laws and initiatives that exist 'on paper' and what actually is implemented 'on the ground' is well known and documented, for both developed and developing countries. The analysis of NDCs to systematically document existing government commitments presents a normative basis and an **entry point to localise climate action and national agendas for mitigation and adaptation** at national, subnational and sectoral level. The FOLU Coalition is engaged in its partner countries to strengthen dialogue with national stakeholders and experts, including to jointly assess practical implementation barriers to accelerate action.

Findings of the NDC policy mapping

Overall, as summarised in Table 2a, FELD's analysis confirms that at least according to their NDCs, most **countries addressing, or planning to address, existing food and land use-related challenges.** Mapped against the 10 Critical Transitions, the analysis shows that **five of the transitions** are addressed particularly well – not necessarily in name but through the indication of relevant policy initiatives and interventions. Specifically the transitions that centre on:

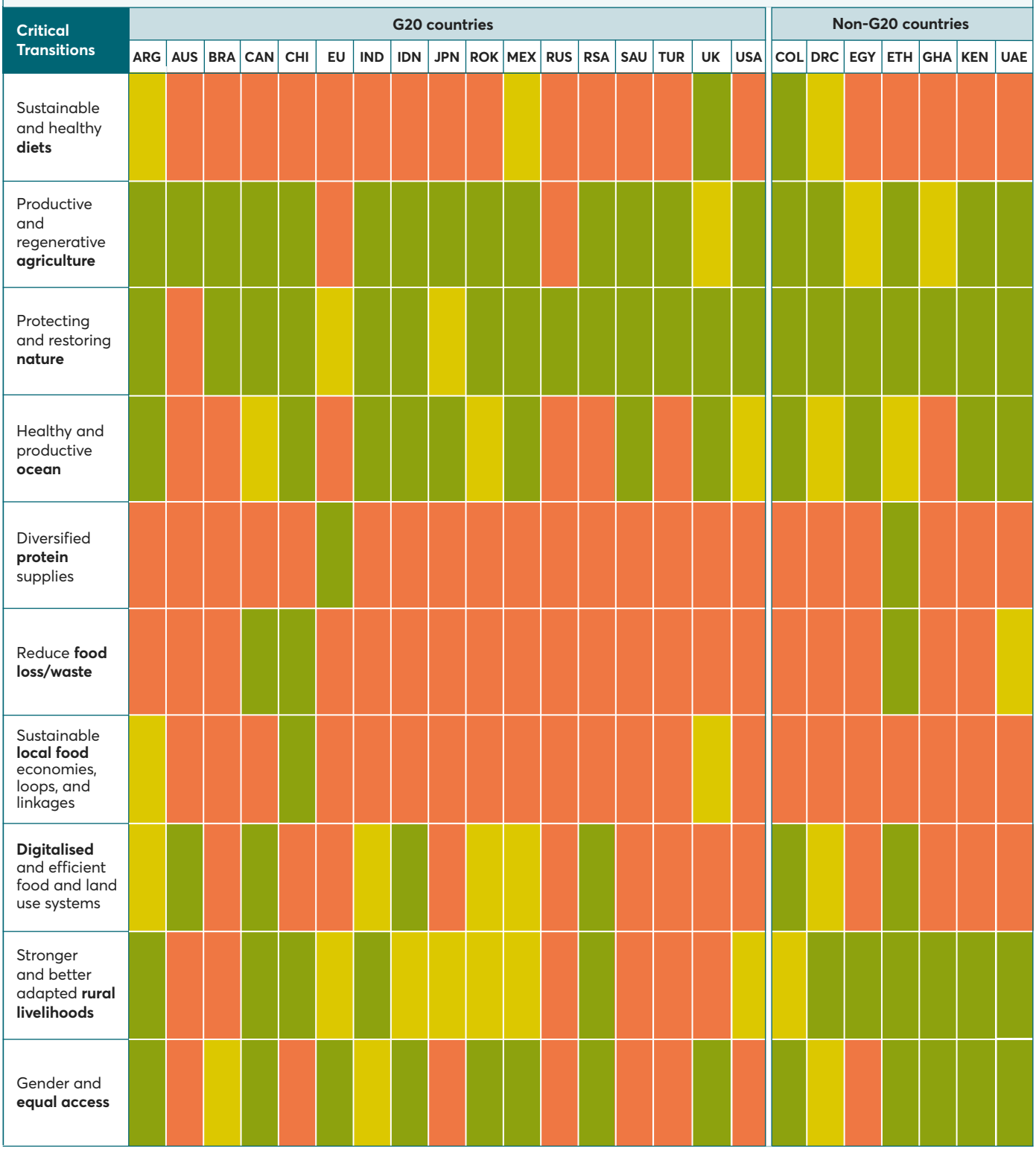
- productive and regenerative **agriculture;**
- protecting and restoring **nature;**
- healthy and productive **oceans;**
- stronger **rural livelihoods;** and
- **gender** and demography.

With respect to **productive and regenerative agriculture**, 19 of the 24 NDCs commit to or mention specific actions, such as the adoption of climate smart agriculture, improved seeds, or development of irrigation techniques. Twenty-one NDCs specifically refer to actions for nature protection and restoration, mainly focusing on the restoration of degraded areas and REDD+ projects, such as in the DRC, Indonesia, Canada, and Mexico. Moreover, half of the reviewed NDCs indicate actions related to **healthy and productive oceans,** such as protecting and restoring aquatic ecosystems (mangrove, coral reefs), and sustainably improving productivity.

Half of the NDCs further include explicit references to policy initiatives, ongoing or planned, around the notion of stronger and **better rural livelihoods,** such as specific insurance schemes and safety nets, and opportunities to ensure a **just transition in rural areas.** Finally, half of the NDCs underline policy-relevant **aspects on gender,** including gender equality laws and protocols with the objective to improve women's income and employment opportunities. These are the green areas of the heat map synthesised under Table 2a. The orange cells indicates that NDCs do mention relevant language relating to the respective policy area – but without indicating a commitment or providing any operational direction. Cells in red do not include any references and relevant language at all.

What food and land-related challenges, policies and commitments are included in current NDCs?

Table 2a. Mapping NDC commitments, policies and references to food and land use against FOLU's Critical Transitions



Essential Action
NDC lists essential policy action(s), including specific commitments, strategies, or funding, related to the Critical Transition.

Nominal Mention
NDC provides inexplicit or unclear information on the Critical Transition (i.e., topic is mentioned, but not as a policy action).

No Mention or Action
NDC does not mention any specific information on policy interventions for the Critical Transition.

Note: 10 Critical Transitions based on FOLU Growing Better Report (FOLU 2019)
Source: authors; for methodological details see Annex C.

As clearly apparent in the heat map, the remaining five transitions and their associated policy areas are addressed much less and inconsistently. These are the transitions and interventions that are predominantly related to **demand- and consumption-side measures,** including:

- the shift to sustainable and healthy **diets;**
- the diversification of **protein supply;**
- the reduction of **food loss and waste;**

as well as broader system-level interventions to

- seize in the opportunities of **digitalisation** and its application to food and land use; and
- **efficient local food economies** to build more sustainable national food and land use systems.

Despite the well-documented evidence on the **role of diets and nutrition,** only five NDCs refer to them and associated policy interventions, namely in Argentina, Colombia, DRC, Mexico, and the UK. Furthermore, these countries do so more in terms of food security and enhancements to agricultural productivity, than with a view to shifting to healthier food and the improved environmental impact. This is particularly relevant for developed countries where shifts to more plant-based diets would have immediate and indirect benefits to emissions. The picture is similar for the transition towards more **sustainable protein sources.** With the single exception of Ethiopia's NDC that refers to support for farmers to diversify their supply of proteins away from beef towards poultry and small ruminants, no other NDC in this set makes a reference to this transition.

Food loss and waste represents another well-documented critical aspect and opportunity for countries to reduce their footprint; however, only Canada and China mention their efforts to stop food waste from going to landfills (Canada), and through the "Clean Plate" campaign (China). The NDC of the United Arab Emirates (UAE) describes its comprehensive approach to reducing food waste through the mobilisation of all stakeholders (citizens, government, and private sector). Other countries, including Indonesia and the UK place emphasis on addressing waste more broadly, but without clear indications of the special dimension of food waste and loss.

The system-oriented transition around **local food "loops" and investments in local food systems** and economies was only touched on by two NDCs: Argentina and the UK briefly refer to local food strategies and the role of public procurement of local foods within cities or peri-urban areas. Finally, most NDCs, while generally referring to the opportunity of technologies and especially of a **digital transformation** globally and in most countries, do not include explicit applications or concrete opportunities for food and land use systems. A few NDCs discuss potentially relevant actions, such as the broader role of access to open data, digital tools to track deforestation, and monitoring, reporting and verification of food and land use systems, as well as generic references to innovative technology.

More coherent policies are required and NDCs could provide clear indications of intent, in order to assess any institutional or political steps needing to be taken, as well as for national and subnational policymakers to evaluate current and planned policies against the NDC targets. This criterium therefore looked for existing or planned national strategies and policies that were directly linked to the actions and orientations described for the food and land sector.

Table 2b. Synthesis of policies across NDCs in relation to 10 Critical Transitions and notable country examples

1	**Promoting Healthy Diets** Overall: Requires priority attention especially in developed countries 	Overall, shifts to healthier diets do not figure prominently in this expanded set of NDCs: while several (five of the total 24 NDCs) refer to food security, only two (the UK and Colombia) provide specific indications of essential actions for this important demand-side transition. In the recent context of increasing food and commodities prices, food insecurity remains a major concern for a growing number countries, in Northern and Sub-Saharan Africa but also India. The **UK** commits to delivering a national shift to healthy diets supported by a sustainable food system ensuring that everyone has access to nutritious and healthier food, while meeting its commitment to broadly maintain food production. Furthermore, the newly updated NDC indicates that the government will be obligated by law to produce a domestic and international food security report every three years. (UK2020, UK2022) **Colombia's** NDC highlights food security and the prevalence of malnutrition and related deficiencies in energy intake in the population, and links to the national food and nutritional security plan for the period 2012 to 2019. (COL2020)
2	**Scaling Productive and Regenerative Agriculture** Overall: Priority on implementation 	An ongoing or planned shift to productive and regenerative agriculture is addressed prominently in 19 NDCs. Some countries like Indonesia and Ethiopia highlight this transition in greater detail, including several commitments to such agricultural practices and associated policies. On the other hand, it also has to be noted that some countries chose not to include specific references to ongoing policy initiatives related to agriculture. Most obviously this is the case with the NDC for the 27 countries of the European Union, which does not explicitly refer to the ambitious EU flagship "Farm to Fork" Strategy. **The Republic of Korea** outlines its national plans for accelerating the adoption of low-carbon farming through improved irrigation techniques in rice paddies and low-input farming. (ROK2021) **Ethiopia's** NDC focuses on improving agricultural production in a climate-smart manner, which includes the expansion of agroforestry, improved crop varieties, livestock diversification, rangeland management and more. (ETH2020) **South Africa's** NDC highlights climate-smart agriculture and, related to it, the provision of capacity building to the farming sector. (SA2021) The **DRC** in its NDC mentions payments for ecosystem services (PES) and subsidies to incentivise the adoption of productive and regenerative agriculture. (DRC2021) **Brazil's** NDC explains that its Low-Carbon Agriculture (ABC) plan has provided support to the agricultural and husbandry sector to encourage the use of a no-tillage system, crop-livestock-forestry integration, agroforestry, and forest planting. (BRA2022)
3	**Protecting and Restoring Nature** Overall: Priority on implementation 	Nature and nature-based services are generally covered by almost all NDCs, through references to one or more essential actions to protect existing forests and ecosystems, address deforestation and degraded lands. **Canada's** NDC addresses increased funding for Indigenous Protected and Conserved Areas and Indigenous Guardians programmes. These programmes include investments of CAD2.3 billion in Canada's Nature Legacy Initiative which aims to reduce biodiversity loss, tackle climate change, and protect and create jobs. (CAN2021) **DRC's** NDC provides details on its priorities and plans to restore degraded forest areas through plantations in forest frontiers, as well as to develop the REDD+ scheme even further to increase forest cover. In addition, it aims to establish further protected areas in national parks and restore wetlands through their forest sustainable management programme. (DRC2021) **Indonesia's** NDC presents a FOLU Net Sink 2030 target (-140 MtCO2 emission level) through the strengthening of sustainable forest management, restoration of forest and other degraded ecosystems, as well as effective land use and spatial planning, REDD+ efforts, and prioritising local and best practices to use natural forest resources. (IND2022) **Kenya** under its overall emission reduction target of 30% (by 2030) refers to the potential of forestry and agriculture, by expanding protection and nature restoration. (KEN2020)
4	**Securing a Healthy and Productive Ocean** Overall: Expand attention to all relevant countries 	This Critical Transition does not apply to all countries but to all of the NDCs analysed here. Around half of them list policies or commitments broadly related to healthy oceans – less so with specifics on sustainable fishing and fisheries but more on blue carbon, the conservation of ocean ecosystems and coastal areas. Specific essential actions mentioned include driving sustainable fishing and improving the sustainability of the shipping infrastructure, actions for ocean protection, including specific targets. The **UK's** NDC includes a dedicated section on ocean and the marine environment, with specific policies aimed at the sustainable use, protection, and restoration of the UK's marine environment. The policies include UK Marine and Coastal Access Act (2009), the Environment Bill and Fisheries Act, UK Marine Policy Statement, UK Marine Strategy, the UK Marine and Coastal Access Act and Fisheries Act, and the 25 Year Environmental Plan to restore historical losses including in marine environment. (UK2020, UK2022) **Australia's** 2022 NDC provides an outline of investments in the health and resilience of ocean ecosystems, including by strengthening the management of the national network of Marine Parks and expanded budgets for the protection of the Great Barrier Reef. (AUS2022) **Saudi Arabia's** NDC aims to restore mangroves through the development of innovative technologies to enhance coral reefs' resilience to increasing temperatures. (SAU2021) **Kenya's** NDC includes the preservation of blue carbon ecosystems and payment for ecosystem services (PES) in coastal areas as one of its main focus areas. (KEN2020)
5	**Investing in diversified sources of Protein** Overall: Requires priority attention especially in developed countries 	Closely linked to the transition to healthy and sustainable diets, the discussion of alternative and otherwise diversified supplies of proteins is largely limited to economies and societies in Europe and North America. Its absence in NDCs, however, might not preclude ongoing plans and strategies in some countries. **Ethiopia's** NDC is the only one to nominally refer to plans for diversifying protein supplies, namely through a commitment to diversify livestock and animal mix through the promotion of poultry and small ruminants. (ETH2021)

Table 2b. Synthesis of policies across NDCs in relation to 10 Critical Transitions and notable country examples

6	**Reducing Food Loss and Waste** Overall: Requires priority attention in most countries 	While relevant, documented and recognised as a major challenge (and opportunity) in most countries, food loss and waste action has found its way only into few NDCs. Of the 24 NDCs, only four reflect a commitment to targeted actions or as part of a broader effort to improve waste management. The **UAE** presents its National Food Loss and Waste Initiative as a broad stakeholder engagement to reduce and encourage treatment of food waste. (UAE2022) **Canada's** NDC includes a 2030 commitment to reduce food and organic waste sent to landfills – although without mentioning any specifics of how the country is planning to achieve the commitment. (CAN2021) **China's** NDC points to the "Clean Plate" campaign, launched at national level to combat food waste. Interestingly, the NDC does not directly refer to China's "Anti Food Waste Law" (in force since April 2021) even as it is a key part of what the NDC refers to as 'green and low carbon lifestyle' (CHI2021)
7	**Building Local Loops and Linkages** Overall: Requires integration and strengthening 	Investments in local food systems, their functioning and linkages are considered critical to achieving more sustainable food and land use. References to systemic aspects to this transition and local food economies, circularity, sourcing and procurement and the circularity of food systems are limited to only generic comments in two NDCs. **Argentina's** NDC refers broadly to related aspects in its discussion of the development of public policy instruments to increase the sustainability of food systems. (ARG2021) The **UK** outlines its plans to move away from a "linear" towards a more circular and sustainable economy. In the 2020 Programme for Government, Scotland has committed to developing a local food strategy. (UK2020, UK2022)
8	**Harnessing the Digital Revolution** Overall: Requires integration and strengthening 	While references to innovative technologies and the opportunities they present for addressing climate change can be found frequently across all NDCs, only few apply and specify this for the food and land sector. Similarly, many countries emphasise the need for (digital) monitoring, reporting and evaluation systems, but again only rarely specified to a "digital revolution" in the food and land sector. **Australia's** NDC sets six "technology stretch goals", including one related to soil carbon measurement, to be developed through advancements in proximal sensing, modelling, and remote sensing technologies. (AUS2022) **Indonesia's** NDC presents a national transparency framework and MRV system for mitigation, including for REDD+ activities. It also has a safeguards information system for REDD+ in place, as well as an inter-ministerial team for the monitoring and evaluation of NDC implementation. (IDN2022) **Mexico's** NDC outlines the country's aims to strengthen zero-net deforestation, restoration projects and agricultural synergies – all of which are included in a national system of constant monitoring and follow-up to ensure effectiveness. (MEX2020)
9	**Delivering Stronger Rural Livelihoods** Overall: Requires integration and strengthening 	Across many NDCs, countries highlight the need for a just (rural) transition and for safety nets for vulnerable groups, often referring to support for farmers or rural communities with training, financial and non-financial resources, and to the need for monitoring how policies affect rural communities. **Kenya's** NDC outlines its plans for social safety net structures to be developed for women, youth, and other vulnerable groups under its innovative County Climate Change Funds (CCCF). Insurance and safety net schemes provide rural households with risk management tools to strengthen rural dwellers' resilience. (KEN2020) **Argentina's** NDC refers to opportunities for a just transition through improved workers protection, the promotion and creation of sustainable jobs and infrastructure, as well as rural dwellers' access to credit, technologies, supplies and trainings. (ARG2021) **Ethiopia's** NDC specifies programmes and activities in various sectoral plans to support smallholder farmers, including an Agricultural Growth Programme, Livestock Master Plan, and more. (ETH2021)
10	**Improving Gender Equality and Accelerating the Demographic Transition** Overall: Requires integration and strengthening 	In line with other global processes and communications, NDCs by and large include language related to the role of gender and demographic trends. Rarely, however, this extends beyond background sections and as an operationally relevant perspective to food and land use, and involves specific measures meant to address gender dimensions of food and land use transformation. **Ghana's** NDC includes an index of gender responsiveness when detailing 19 policy focus areas, involving one specifically dedicated to "Foster social inclusion focusing on youth and women". (GHA2021) **Kenya's** NDC in its section on adaptation dedicates several commitments to "Gender, youth and other vulnerable groups". (KEN2020) **Canada's** NDC commits to the application of Gender-Based Analysis Plus (GBA+), an analytical process for assessing systemic inequalities and advancing gender equality across policy areas. (CAN2021) **South Africa's** NDC emphasises the need for financial and technical support to women's grassroots organisations, including for them to access climate finance schemes. (RSA2021)

Note: 10 Critical Transitions based on FOLU Growing Better Report (FOLU 2019).

Emerging from this systematic review and mapping of policy priorities and system-related critical transitions are several **take-aways** that might be broadly indicative for the state of national food and land agendas.

First, that countries define their national food and land-related commitments primarily through policy interventions on the **production-side,** including measures related to farming practices towards productive and regenerative agriculture, or the protection of nature. Similarly, they more strongly refer to underlying and cross-cutting concerns related to employment and income, including policies directed to improved rural livelihoods and incomes. Less emphasis in turn is placed on interventions aimed at changing **consumer behaviour,** through shifts toward healthy and sustainable diets, and other changes in consumption, including related to meat consumption and the development of alternative sources of protein. This might reflect the general experience of public sectors with past efforts to change population-level behaviour; policymakers might also not see or sufficiently understand the link and potential of demand-side interventions to impact and contribute to the large-scale reduction of emissions. However, changes on both the supply and demand-side are needed to mitigate climate change.

As highlighted in the qualitative analyses by the Global Alliance for the Future of Food (GAFF 2022a), many NDCs also reflect a **lack of consultation and involvement** of civil society organisations, health, and nutrition experts throughout the development and design of NDCs, thereby likely affecting the consideration of more complex, interdisciplinary demand-side interventions (see Box 3).

Overall, this updated assessment of the 'policy content' of NDCs from a food and land perspective confirms **two overall conclusions:**

1. **NDCs still show vast room for improvement,** especially with regard to specific policy measures across the full spectrum of necessary transitions, with a focus on systemic elements and policy areas; and
2. **most countries do include in their NDCs directly relevant commitments,** priorities and entry points for national level planning and strategy development, as well as the mobilization and allocation of resources around specific policy initiatives.

Two years into the "Decade of Action", the focus for all countries should therefore shift to action and the **"practicalities of implementation",** including the direct engagement with all national stakeholders through cross-sectoral dialogue and consultations to identify concrete policy responses and local solutions, planning frameworks and delivery mechanisms. The practical focus on action in some critical areas is likely to bring up and improve the recognition of others, especially in the development of system-wide strategies and planning processes that translate existing NDC commitments into practical policies, roadmaps and programmes.

Box 3. Process matters: Findings from the GAFF NDC analysis

In 2021, the Global Alliance for the Future of Food (GAFF) through Climate Focus undertook a detailed qualitative study of 14 NDCs. Its "assessment of food systems in the NDCs" involved interviews with national food system stakeholders, guided by an advisory committee, and focused on identifying lessons from, and recommendations for, the NDC development process; NDC content and design; and NDC implementation follow up. The study findings point to the important implications of inclusive processes and early consultations on the content, design, and prospects for NDC implementation. NDCs in many countries were designed under the leadership of a single government ministry, involving mainly actors from the supply/production side of food systems, like farmers, traders, and retailers – but not consumers, civil society, health, and nutrition specialists. These processes are reflected in NDC designs which are often dominated by production-side actions – and generally lack references to demand-side measures such as societal shifts in healthy diets, consumption patterns, and the reduction of food loss and waste. The recommendations from the GAFF study underline the importance of inclusive NDC development processes that involve the whole range of stakeholders for a broader perspective on the opportunities for mitigation and food system transformation.

Source: GAFF 2022a

3. How action-oriented are NDCs to transform food and land use?

By mapping NDCs with their commitments, policy priorities, and specific interventions against FOLU's Critical Transitions framework, it was possible to get a sense of their sectoral priorities and overall thematic scope, as well as of notable gaps regarding food and land use issues across the NDCs.

The extent to which NDCs are focused on action meaning the practical implementation of policies in countries to achieve indicated policy objectives and national targets, is in the focus of the second part of FELD's analysis. This was done through a small number of policy- and implementation-related criteria, considering common barriers to implementation: aspects of financing and incentives (and linked to this, appropriate policies putting these in place), approaches to planning including at the spatial scale at which the success of sustainable practices and methods have been demonstrated, and access to relevant technologies (Shukla et al. 2019; Smith et al. 2019).

While there is agreement on the importance of these factors for the challenge of implementing policies – in this case across sectors with a focus on systems involving a significant level of complexity – there is much less agreement on whether NDCs are the documents and processes to look for them. Legally, **NDCs present an obligation of State Parties** under the 2015 Paris Climate Agreement, but without specific requirements regarding their content and the inclusion of implementation-relevant information. In public communications, the UN, many other organizations and the global media refer to them frequently as "national (climate) action plans" – a notion that itself is beyond the actual obligation. In contrast to this, most countries seem to see NDCs as high-level documents to merely outline national targets but otherwise leave aspects of implementation to other, mostly domestic processes.

While the Paris Agreement broadly leaves it to Parties what to include in their NDC submissions, it also emphasizes the need for transparency and accountability. Against this background, questions about the credibility and reliability of the commitments made in NDCs are getting louder, especially when targets are not backed up by concrete policy actions. It has to be noted, though, that the mere absence of information does not automatically mean that the country was not planning to operationalise its commitments. In reverse, the inclusion of a high level of detail also does not guarantee implementation or commitment to action. For this reason the analysis undertaken here was not about measuring the quantity of (operational) detail but focused on a qualitative assessment of whether NDC commitments were substantiated by indications of the 'what' and 'how' Governments were planning to do in order achieve them.

For a systematic review of these questions, the FELD team assessed each of the 24 along the following questions and criteria:

A. **Does the NDC specify commitments, targets, and policy priorities for (a) agriculture and food, and (b) land use, land-use change and forestry (LULUCF)?** For this, the NDCs and their commitments were checked for specific indications of policy priorities, initiatives and reform programmes, ongoing or planned, across agriculture, food, and land-use-related sectors.

B. **Does the NDC connect commitments and concrete policies with the country's existing policy contexts related to the food and land sector?** NDCs were reviewed for links and connections of commitments with specific policy measures, situated within relevant and existing policy contexts, including cross-sectoral policy initiatives.

C. **Does the NDC identify any financial resources committed, allocated or required, for the implementation of indicated policies and actions in the food and land sector?** NDCs were checked for indications of national and international public financing instruments, allocations and commitments, as well as financing needs, as relevant for the operationalization and planning of said policy priorities and actions.

D. **Does the NDC consider aspects of land use planning and spatial information related to the operationalization of policies to deliver national commitments?** NDCs were reviewed for policy-related aspects of land use planning and indications of available or needed spatial data and information, including to identify the mitigation potential from different land-use changes, as well as threats and priority areas for conservation and restoration.

E. **Does the NDC indicate technological development, transfer, investments, and capacity building needed to implement the indicated policy initiatives and changes?** The development and transfer of existing, new, and emerging technologies can support the transitions needed in the food and land sector. The team reviewed if NDCs made specific indications of technology priorities and needs, including if commitments are conditional on specific technologies which underlines the relevance of NDCs for operational follow up.

Each NDC was analysed systematically against the criteria outlined in the respective assessment framework (see Annex C). Also, for this assessment the team undertook detailed desk reviews but no interviews or cross-checks with country experts.

How action-oriented are the NDCs from a food and land perspective?

Table 3a. Overview of findings from the desk review

	Commitments and policy measures		Connections and policy context	Financing	Land use planning	Technological development
	Does the NDC specify commitments, targets and policy priorities for agriculture and food, LULUCF sectors?		Does the NDC connect commitments and concrete policies within existing policy context?	Does the NDC identify financial resources committed, allocated, or required?	Does the NDC consider aspects of land use planning and spatial information?	Does the NDC indicate aspects of related technology development?
	Agriculture / food	LULUCF				
G20 Countries						
ARG	▲▲	▲▲	▲▲	▲	▲▲	▲
AUS	▲	○	○	▲	○	▲▲↑
BRA	▲▲	▲	▲▲▲	▲▲	○	○
CAN	▲▲▲	▲▲▲	▲▲	▲▲▲	○	▲
CHI	▲▲▲	▲▲	○	▲	▲	▲▲
EU	○	▲	▲▲	○	○	○
IND	▲	▲▲	▲▲▲	▲	○	○
IDN	▲▲	▲▲▲	▲	▲	▲▲	▲▲
JPN	▲▲	▲▲	▲▲↑	○	○	○
ROK	▲▲↑	▲▲↑	○	○	○	○
MEX	▲▲	▲▲	▲▲	○	○	▲
RUS	○	▲	○	○	○	○
RSA	▲	○	○	○	▲	▲
SAU	▲▲	▲▲	○	○	○	▲▲
TUR	▲▲	▲▲	▲▲	○	○	○
UK	▲▲	▲▲↑	▲▲▲	▲▲↑	▲	▲▲
USA	▲▲	▲	○	▲	○	▲▲
Non-G20 Countries						
COL	▲▲▲	▲▲▲	▲▲▲	▲▲▲	▲▲▲	▲▲
DRC	▲▲	▲▲▲	▲▲▲	▲	▲▲	▲▲
EGY	▲▲	○	○	▲▲	○	▲▲
ETH	▲▲▲	▲▲▲	▲▲▲	▲	○	▲
GHA	▲	▲	○	▲▲▲	○	○
KEN	▲	▲▲▲	▲	○	▲	○
UAE	▲▲	▲▲▲	▲▲▲	▲	▲	▲▲

Note: In bold are newly added countries and NDCs not included in the 2021 brief. Green cells indicate highest rating; green arrows (↑) indicate improvement compared to the 2021 review. Source: authors based on FELD methodology, assessment guides and internal reviews (see Annex C)

Legend (Criteria / Rating)	**Commitments and policy measures**	**Connections with policy context**	**Financing**	**Land use planning**	**Technological development**
	Does the NDC specify commitments, targets, and policy priorities for agriculture and food, LULUCF sectors?	Does the NDC connect commitments and concrete policies within existing policy context?	Does the NDC identify financial resources committed, allocated, or required?	Does the NDC consider aspects of land use planning and spatial information?	Does the NDC indicate aspects of related technology development?
▲▲▲ **Action-focused**	Specific including targets and aspects of implementation	Relevant policies across (sub)sectors	Specific for actions in (sub)sectors	Specific for (sub)sectors	Specific for (sub)sectors
▲▲ **Conducive to action**	Indications without targets or implementation	At least one sector	At least one sector	At least one sector	General needs or plans
▲ **Not conducive to action**	Incomplete or generic information	Incomplete or generic information	Incomplete or generic information	Incomplete or generic information	Incomplete or generic information
○ **Absent or unclear**	No or unclear information	No or unclear information	No or unclear information	No or unclear information	No or unclear information

For detailed assessment criteria and ratings, please refer to the respective FELD website section.

How action-oriented are the NDCs from a food and land perspective?

Table 3b. Synthesis of findings and country examples

Do NDCs specify commitments, targets, and policy priorities for (a) agriculture and food, and (b) LULUCF?

Both sectors, agriculture and food, as well as LULUCF, are broadly included and covered across the analysed NDCs. This is an important factor and encouraging finding underlining the recognition of food and land-related emissions and opportunities for removal, as well as the relevance of NDCs for driving global food and land use transformation.
Seventeen of the 24 NDCs include commitments, targets or policy priorities for the agriculture and food sector; almost the same number, but different ones (16 out of 24) do so for LULUCF. A total of 14 NDCs include commitments for both sectors.

Notable is a lack of commitments in the NDCs of two large agricultural producers, namely the EU and the Russian Federation. In the case of the EU, references to agriculture and forestry are limited to the NDC's ICTU annex. The EU did not revisit its NDC post-COP26 for an updated NDC in 2022. When it does as expected for early 2023 it will probably include references to the EU's Farm to Fork and Biodiversity strategies. Also the NDC of the Russian Federation does not include mitigation commitments on food or agriculture which is looked at primarily from an adaptation perspective (Climate Action Tracker 2022).

NDC examples

- **Ethiopia's** NDC includes a sectoral target to reduce emissions from (a) agriculture by 0.9% (unconditional) or 7.6% (conditional), mostly through changes in livestock farming; and (b) from LULUCF by 34.6% (unconditional) and 171% (conditional) through reforestation and restoration programmes, as well as grassland improvement interventions. (ETH2021)
- **Colombia's** NDC foresees mitigation measures in the agriculture sector, through the publication of regional guidelines to intensify productivity and maximise efficiency, the implementation of agroforestry systems, and the plantation of permanent crops. With respect to LULUCF, it describes specific objectives and measures for adaptation, such as the development of forest management plans and tools, and recovery and restoration measures, among others. (COL2020)
- The **DRC** identifies LULUCF as its main approach to mitigation, by reducing deforestation and forest degradation, by promoting afforestation and reforestation activities, and by supporting forest communities. The NDC focuses on REDD+ programmes with the potential to reduce emissions by 28%. (DRC2021)
- **Japan's** NDC makes explicit reference to the reduction of emissions from LULUCF, in alignment with the Kyoto protocol. It targets 37 $MtCO_2$ by 2030, mostly through forest management (JAP2021)

Spotlight:
Sectoral targets

In addition to relative targets, NDCs also include absolute ones referring to numbers or hectares of trees planted or land irrigated that are specific to some of the NDC-listed activities (see Annex A).

- Of the 24 NDCs in this set, four include sectoral targets for emission reductions in agriculture and LULUCF (**Japan, Indonesia, Ethiopia, and DRC**).
- Other countries make broader commitments: **Colombia** estimates that land-based mitigation will contribute to 70% of its total emission reduction. (Climate Action Tracker 2022)
- The **UAE** has a target for a specific activity: the planting of 100 million mangrove seedlings by 2030.

Most of the G20 countries, including the EU, currently have not set specific targets in their NDC for the reduction of emissions from either agriculture and food, or from LULUCF to back up their respective overall mitigation targets.

Spotlight:
Adaptation actions

Most developing countries, especially in Sub-Saharan Africa, have and are responsible for very small shares of global GHG emissions (see also emission figures and shares in Annex B). Their NDCs therefore focus on the challenges of adaptation and the impacts of a changing climate. Similarly, G20 countries have increasingly dedicated adaptation sections in the updated NDCs (Box 4).

NDCs of the newly included countries, especially the ones where a large share of the population relies on the AFOLU sector for their livelihood and hence faces great risks from a changing climate, reflect key adaptation priorities alongside their mitigation efforts. This underlines the need for action in agriculture, food and LULUCF sectors with commitments and policy initiatives that are conducive to action and implementation follow up. Interestingly,

- **Kenya's** NDC presents a wide range of prioritized adaptation programmes, including the restoration and conservation of degraded areas, the promotion of nature-based solutions for enterprises, as well as the development of commercial activities in forest areas. (KEN2020)
- **Egypt's** NDC refers to the AFOLU sector for adaptation alone, not for mitigation. Its adaptation measures include the adaptation of crop production, on-farm irrigation, and a general modernisation of on-farm practices. (EGY2022)
- **Ghana's** NDC includes adaptation measures in the AFOLU sector with mitigation co-benefits through the promotion of nature-based solutions by promoting ecotourism to conserve biodiversity, and the Green Ghana Initiative to plant and maintain vegetation. (GHA2021)

How action-oriented are the analysed NDCs from a food and land perspective?

Table 3b. Synthesis of findings and country examples

Do NDCs connect commitments and concrete policies within countries' existing policy context related to the food and land sector?

Another measure of NDCs' orientation to action and operational relevance is the specificity with which they connect commitments with concrete policy initiatives and situate them within existing policy contexts. Ambitious targets for emission reductions ultimately are only as credible as they are supported by effective policies, programmes and implementation plans. While NDCs cannot be expected to provide all this information in detail, references to specific policies, existing and planned, contribute to an understanding of how the country intends to operationalise and reach the commitments it made.

The analysis of the 24 NDCs confirms that the extent to which countries connect their NDC commitments with concrete policies varies greatly. Six NDCs list at least some of the national policies in place or planned in either agriculture and food, or the LULUCF sector. These references make the NDC at least somewhat conducive to policy follow up at sector level. Eight of the NDCs go even further by listing policies for both sectors. However, a total of nine NDCs neither specified nor linked any policies in the respective sectors to the commitments and their implementation.

NDC examples

- **Kenya's** NDC provides a list of relevant national policies for the achievement of commitments, some of which are central to the priorities listed for the AFOLU sector (such as the Kenya Climate Smart Agriculture Strategy). (KEN2020)
- The **UAE** provides a detailed list in its NDC that specifies policies and programmes in the food and land sector, such as the National Food Security Strategy 2051 prioritising sustainable agricultural and consumption practices to promote resilience, productivity, and soil health. (UAE2022)
- The **UK's** newly updated NDC provides an expanded list of wide-ranging policies, including under devolved competence of its four nations, that cover many aspects of food and land systems change (even as these are not directly listed under the NDC's "policies and measures" section). (UK2020, UK2022)

Do NDCs identify financial resources committed, allocated or required, for the implementation of indicated policies and actions in the food and land sector?

Financing and financial resources represent a key factor, and in fact condition, for the implementation of any policy or government programme, especially when the aim is a long-term or permanent transition of entire sectors and economies. Climate financing remains a core issue for climate negotiations, both for the enactment of meaningful mitigation measures and for adaptation.

Overall, most NDCs provide no or little information on their commitment, allocation, or requirement of financial resources to support the transitions committed to in national agriculture, food, and land use sectors. Only six NDCs of the 24 reference a specific law, financing instrument or investment directly related to NDC commitments for the sector. In the case of three countries, the NDCs provide specific funding commitments which underlines their strong focus on action. However, a total of nine NDCs, all but one from G20 countries, do not provide any information related to financing and financial resources, whether allocation or requirements, for actions in the sector.

With regard to financing requirements, only three NDCs provide a more comprehensive outline of funding needs to implement their activities in the food and land sector (Colombia, Ghana, and, in less detail, Argentina). This result is in line with a larger study conducted by the GAFF in which only a quarter of the 167 NDCs they reviewed indicate financing needs to transform food systems (GAFF 2022). For developing countries, the identification of funding needs and links to specific policy measures, programmes, and initiatives can be instrumental in mobilising international support; NDCs are key in directing international climate finance to the priority actions and investments in both mitigation and adaptation priorities.

NDC examples

- The NDCs of **Canada, Argentina, Australia** and **Brazil** reference specific programmes, laws, funds, and investments directly related to policy initiatives and transitions in relevant sectors. **Brazil** and **Canada** even specify the amounts of these public sector investments, in the case of **Canada** for both agriculture and LULUCF, for mitigation and adaptation. (CAN2021, ARG2021, AUS2022, BRA2022)
- **Colombia's** NDC specifies the level and amount of finance needed for several of its prioritised policy initiatives in the food and land sectors. It also indicates the kind of financial instruments, the use of finance and the responsible institution. (COL2020)
- **Ghana's** NDC provides a detailed table summarising the funding needs for each of its 19 priority policy actions, including the funding for cleaner cooking solutions, resilient agriculture, refrigeration, and sustainable forest management. (GHA2021)

How action-oriented are the NDCs from a food and land perspective?

Table 3b. Synthesis of findings and country examples

Spotlight: Finance	A systematic recent analysis by the Global Alliance for the Future of Food across 167 NDCs found that: • Overall, 70% of current NDCs lack adequate detail on national funding needs for food systems. • Across **developing countries,** food systems priorities are commonly underestimated and underfunded; in their NDCs, they indicate funding needs of USD 14 billion per year. Even as 92% make references to food as part of their mitigation, adaptation, or cross-cutting measures, only 27% specify any finance needs for these measures. Of all developing country finance needs quantified in NDCs, only 4% are earmarked for implementing food system measures. • Among **developed countries,** the majority (62%) did not include measures for food systems, and only two countries give information on finance for NDC implementation. GAFF's recommendations are for policymakers to seize on the NDCs in order to facilitate the flow of climate finance to food systems transformation, by (1) identifying food systems measures in NDCs; (2) by including funding for food systems mitigation and adaptation as quantified investments; (3) by setting targets and indicators to measure how climate investments yield multiple benefits; and (4) by including performance measurement for funder reporting (GAFF 2022b).
Do NDCs consider aspects of land use planning and spatial information related to the operationalisation of policies to deliver national commitments? 	The consideration of geographic and spatial dimensions of system-wide changes, and the central role of land use planning based on spatial information, is an important aspect for the operationalisation of ambitious policy initiatives like the ones needed for addressing climate change. Of the 24 NDCs analysed in 2022, only very few include references to geographic dimensions, to land use planning or the role of spatially explicit information linked to the implementation of national mitigation and adaptation efforts for the AFOLU sector. In fact, a total of 15 NDCs do not provide any related information. Four NDCs include at least some information which strengthens the respective commitments made for the sector and makes for a conducive context for policy follow up. Only one country provides geographic dimension for its commitments. **NDC examples** • The **DRC** dedicates a full section of its NDC to nature-based solutions, including several measures to protect wetlands through the National Wetland Strategy, substantiated by a map indicating areas for action and implementation. (DRC2021) • **Indonesia's** new NDC identifies the "integration of climate change into spatial planning" as a key principle. Consequently, local spatial planning is mentioned in several measures with regard to climate adaptation throughout the NDC. (IDN2022) • **Colombia's** NDC includes an annex describing "territorial measures", including detailed commitments in the AFOLU sector for each department of the country. (COL2020)
Does the NDC indicate technological development, transfer, investments, and capacity building needed to implement change? 	Technology to help solve the challenges presented by climate change represents a common reference in NDCs. The specification of the role of technology in NDCs would help in planning and mobilising resources for investments and capacity building, and thus support effective follow-up action and operationalisation of NDC commitments. In most of the 24 NDCs, technology is primarily mentioned regarding the agricultural sector and the need for technology development and transfer. Nine NDCs address technology needs directly in relation to driving impacts in the agriculture, food, and land use sectors. However, often these references remain vague, except for Canada's NDC that specifies investment figures. Only two NDCs (Indonesia and Colombia) mention the role of technology in the forestry sector. **NDC examples** • **Colombia, Indonesia,** the **USA,** and the **UK** include specific focus areas for technology development and transfer in the sector, such as improved manure management and cropland nutrient management (USA), and a phase-down of HFC gases in refrigeration equipment (UK). (COL2020; USA2021; UK2020, UK2022) • Only **Indonesia** and **Colombia** cover the role of technology for both the agriculture and food, and LULUCF sectors, including the development of environmentally friendly technologies in forest management (Indonesia). (COL2020; IDN2022) • **Australia's** and **Canada's** NDCs mention a specific programme fund for the development of new technologies in the agricultural sector (the Technology Co-Investment Fund and Technology I Investment Roadmap for Australia; and the Agricultural Clean Technology Program for Canada). Their NDCs do not provide further information on specific focus areas. (AUS2022; CAN2021)

How action-oriented are the NDCs from a food and land perspective?

Table 3b. Synthesis of findings and country examples

Spotlight: Assessing feasibility	Under UNDP's 2021 *The State of Climate Ambition* report NDCs were assessed on several quality dimensions, including their feasibility (alongside robustness, ownership and inclusiveness). Defined as "key enabling conditions for implementing NDCs, such as mobilisation of finance, technology transfer and institutional capacity building", feasibility relates closely to our criteria and description of "conducive to action". For their much larger set of countries, UNDP's analysis found that while "Second-generation NDCs are higher quality, but finance remains a key hurdle" only 27% of NDCs rated above average in terms of feasibility (UNDP 2021).

Institutional arrangements for NDC implementation and coordination

Another important aspect for the effective translation of NDC commitments into concrete plans and programmes relates to institutional arrangements. Which ministries are assigned with responsibilities for follow up, coordination and implementation of the commitments contained in the NDCs? What inter-ministerial coordination mechanisms exist to work across sectors, mandates and portfolios – and with private sector and civil society stakeholders? Which technical departments are charged with the effective development and design of the committed policies? And who is responsible for identifying, costing and mobilising the necessary financial and other resources?

As stated earlier in chapter 3, NDCs are and cannot be expected to provide detailed information on the operationalization of its commitments. At the same time the question of institutional arrangements and the responsibility for implementation is indeed very central to its political relevance. To date, other studies (including GAFF 2022a) looked mostly at the institutional arrangements for the development of the NDCs themselves, including parliamentary and inter-ministerial committees, and less at the institutions and mechanisms for implementation. While only few of the NDCs included in this sample identify the institutional mechanisms that are assigned responsibility, they provide interesting insights and underline the importance of making these explicit in the immediate context of the national commitments.

What are the institutional arrangements for NDC implementation?

Table 4. Summary of analysis and country examples

What are the institutional arrangements and mechanisms identified in the NDCs? 	Nineteen of the 24 NDCs make references to the various institutional arrangements associated with the development and coordination of NDC processes. These include inter-sectoral, inter-ministerial, parliamentary and advisory committees, either mandated for climate change in general or dedicated to more specific sectors. In some case, countries established mechanisms for the involvement and engagement with the private sector and civil society. Only a few NDCs make explicit references to institutional frameworks for implementation and the political coordination across sectors, levels and stakeholders. Additional analysis will be needed to review the role of actual mechanisms in place across countries, including experiences with different models, to identify good practices and lessons. • **Kenya's** NDC has a dedicated section on its "policy, legal and institutional framework" for implementation of Kenya's climate plans, with a legal base in the 2016 Climate Change Act. This Act also provides for the formation of a National Climate Change Council to coordinate the work of national government and devolved county level authorities, as well as private actors. Furthermore, a technical Climate Change Directorate at the national level and regional Climate Change Units are charged with mainstreaming implementation. The framework also mandates new National Climate Change Action Plans every five years, to be funded by Medium-Term Plans. • **Australia** has a dedicated Technology Investment Advisory Council in place; **Japan** a Central Environment Council and an Industrial Structure Council; **The Republic of Korea** established a Committee on Green Growth, and a Joint Commission dedicated to engagement with the private sector and civil society. • The **UK** Committee on Climate Change is primarily composed of experts, explicitly established as an independent body advising on climate issues in the UK.

Several **cross-cutting take-aways** emerge from this assessment of NDCs' respective focus on action, and key operational and institutional aspects related to implementation.

First, while NDCs to a large extent cover the food and land sector well, with all NDCs mentioning some priorities for both mitigation or adaptation, there are few indications of focused efforts toward the **integration of system-relevant policies** across agriculture, food and LULUCF sectors. Given the complex and cross-sectoral nature of food and land use systems, this raises the question of how and what countries are planning for the practical integration of new policies within existing policy contexts in order to make actual progress and achieve effective food and land use transformation.

Second, the broad absence in NDCs of **sectoral targets for agriculture, food and land use** sectors raises concerns regarding the credibility of the commitments countries make, especially in the case of those with the greatest AFOLU emissions (see table 5, and tables in Annex B). Short- as well as long-term plans and strategies to reduce emissions and reach net zero need to be based on evidence, including current and historical emissions data. For countries ranking high on either absolute or relative measures, the setting of respective targets as part of NDCs and longer-term pathways should be obvious and standard practice.

Table 5. Ranking of highest AFOLU emissions globally, in 2019

Rank	Country	Absolute AFOLU emissions (in $MtCO_2e$)	Relative share of global AFOLU (in %)	Relative share of AFOLU in national GHG (in %)	Relative share of ag alone in national GHG (in %)
1	Indonesia	**1,147**	**15%**	**59%**	9%
2	Brazil	**920**	**12%**	**70%**	**40%**
3	India	**724**	**10%**	22%	22%
4	DRC	**652**	**9%**	**96%**	4%
5	Pakistan	211	3%	48%	**46%**
6	Myanmar	202	3%	83%	**38%**
7	Argentina	166	2%	42%	**34%**
8	EU27	157	2%	5%	15%
9	United States	156	2%	3%	7%
10	Colombia	152	2%	**56%**	**25%**
11	Australia	151	2%	25%	21%
12	Ethiopia	149	2%	**81%**	**64%**
13	Tanzania	132	2%	**85%**	**39%**
14	Nigeria	131	2%	37%	24%
15	Mexico	119	2%	18%	15%
In bold for emphasis		Top 4 countries with highest AFOLU emissions	Top 4 countries >45% of global AFOLU emissions	Countries with AFOLU emissions >50% of national emissions	Countries with agriculture >25% of national emissions

Source: FABLE 2022
Shaded rows indicate NDCs with sectoral targets.

Third, while NDCs cannot and should not be expected to include detailed information or even to replace dedicated operational plans, the **absence of finance, planning and technology aspects** in most NDCs is not encouraging. National commitments, with targets and policy initiatives to achieve them, depend on high-level political support and a conducive context for effective policy and implementation follow up. In all countries, independent of their governance and bureaucratic systems, implementation – meaning the timely and effective translation of policy directions into practical plans, policies and programmes – represents the main challenge for change. Given the complexity of food and land use systems in particular, governments' focus on the "practicalities of implementation" should explicitly address aspects of finance, coordination, land and other forms of strategic and operational planning.

Fourth, given that in most countries, including developed ones, implementation challenges are common, especially if they require the involvement of several ministries, sectors or powerful stakeholders, the **importance of clear governance and institutional responsibilities** for NDC follow up and implementation cannot be overstated. In their absence, the likelihood of implementation to be delayed or even failing is high – especially in the case of complex systemic adjustments that require coordination across multiple ministries, subnational

levels, sectors, industries and other actors. NDCs by and large do not adequately reflect a concern for this critical dimension and condition for the delivery of its commitments. These arrangements are different from those for the development of NDCs, including consultations with stakeholders, civil society and communities.

Finally, the present analysis suggests that **NDCs of G20 countries rate relatively low** in terms of action and consistent consideration of broader systemic and sectoral policy aspects. UNDP's "State of Climate Ambition" report came to a similar conclusion for their analysis, stating that "vulnerable nations are leading on NDC ambition – the role expected from the G20" (UNDP 2021). This might reflect also the support provided by the UN system, the NDC Partnership, and other organisations especially to low- and middle-income countries in developing NDCs. And it demonstrates the high profile assigned to NDCs as a platform for mobilising international support.

While the high quality of NDCs and the consideration of food and land issues by many developing countries is encouraging, the gaps, lack of concrete commitments and insufficient focus on action on food systems and land use in many G20 NDCs are not. The emission profiles of many of the leading economies include significant AFOLU emissions on the basis of very high consumption patterns that are not adequately reflected in their respective NDCs. This is in addition to the **issue of international financing** that will be required by many developing countries to implement their own NDC commitments and the associated transitions toward more sustainable food and land use systems. Only if and when countries are able to reach an agreement on concrete mechanisms for adequate international financing for both mitigation and adaptation, many of the commitments in the NDCs have a chance of materialising. COP27 will be next great opportunity to do so.

Box 4. Adaptation ambition and priority actions in the NDCs

An increasing number of countries included in their NDCs dedicated sections on climate impacts and adaptation – often in addition to national adaptation plan (NAP) – to explain their adaptation ambition and priorities under the Paris process. A team at WRI analysed NDCs from 86 countries (nine of which also have NAPs) with a specific focus on adaptation-related sections. Their findings include that recent NDC updates had more detailed elements on adaptation than earlier versions, and that these were more aligned with other adaptation instruments. Adaptation sections focus mostly on food and nutrition security, water, and other nature-based solutions through a large set of prioritised adaptation actions. Missing in them, however, were key elements important for implementation: commitments to invest in or implement adaptation actions, and only very few NDCs included provisions for monitoring, evaluation, and learning. The study points to the need for governments to better link adaptation across NDCs and related instruments with a stronger focus on the facilitation of implementation, as well as the role of consultations with a wider range of stakeholders. Given the trend of increasing attention to adaptation the study underlines the need for UNFCCC guidance on the integration of adaptation elements in the NDCs.

Source: Dixit et al., 2022; WRI 2022

4. Conclusion: Beyond NDCs, towards evidence-based and aligned implementation strategies

In time for COP27 in Egypt, **some 140 countries have communicated new or updated NDCs** (UNFCCC, 2022b) 2021 and 2022. With the exception of 24 countries, including notably Australia and Indonesia that have presented updated NDCs in 2022 after falling to do so for COP26, most countries decided to stick with what they had already submitted prior to Glasgow.

By failing to **revisit their NDCs and re-align their 2030 targets** as requested by the Glasgow Climate Pact, countries are not adding to the credibility of their commitments: pledges are only as good as the plans and actions that pack up the targets. The next opportunity for countries to update and enhance their 5-year NDCs will be in 2025, for the period of 2030-2035. By then the critical decade of action to begin the drastic reduction of emissions toward the decarbonisation of key sectors and net zero will be over.

While NDCs provide a good sense of countries' level of ambition and policy directions for following up on concrete commitments, the **assessment of actual implementation progress** and concrete follow up needs to happen in countries and led by national governance and sectoral experts. The present analysis of NDC documents and official communications provides a good starting point and 'base line' for critical assessments and policy dialogue in countries, including for the purpose of establishing public accountability. In many countries, NDCs and the commitments governments made at and to global processes are not well known and need first to be 'localised' and connected with ongoing national and sectoral policy discussions.

The emergence and adoption of a number of **sectoral initiatives and announcements** in Glasgow had reinforced a broad impression that collectively the world was making progress. One year later, as identified by the Climate Action Tracker and WRI separately, most of the signatories and even lead sponsors of these initiatives, including the so-called Global Leader's Pledge to End Deforestation, had not even updated their NDCs to include these sectoral initiatives. Specifically, WRI found that only 15 of the 119 countries that signed the Global Methane Pledge launched last year have included a specific, quantified methane reduction target in their current NDCs.

National contexts vary widely across continents, governance systems and economic status. So do their emission profiles and the relevance of their agriculture, land, and forestry sectors for climate mitigation and adaptation. Within the 23 countries and the EU covered in this brief, emission shares span between 24% of global GHG emissions (in the case of China) down to 0.04% of global GHG (for Ghana). Similarly, emissions from AFOLU represent a spectrum from above 90% of national GHG emissions (in the DRC) down to around 1% (in this set of countries, for Saudi Arabia). The variation is even greater regarding LULUCF, from some countries with net emissions to others that sequester more carbon than they emit (a group of countries that includes Japan, Republic of South Korea, and Russian Federation; see tables in Annex B).

The specific **characteristics and challenges that result from these emission profiles** have yet to be fully incorporated in national planning and pathways, including for short-to-medium term sectoral targets in NDCs, as well as for mid-century net zero strategies. For the next iteration of NDCs to still act on the existing Glasgow Climate Pact request or to present for 2025 – countries with high levels of emissions and/or high potentials for emission removals will need to develop commitments that include targets and explicit actions on AFOLU.

The FABLE (Food, Agriculture, Biodiversity, Land-Use and Energy) Consortium developed a typology of countries based on their respective AFOLU emissions profiles, food consumption and land-based CO_2 removal potential (FABLE 2022; see Box 5). In countries where land-based CO_2 removal is substantial, avoided deforestation and afforestation might be primary mitigation options. In countries where removal potential is low, however, CO_2 mitigation would need to focus on avoided non-forest natural land conversion and the abandonment of agricultural land (FABLE 2022).

The development of national pathways on the basis of national emission profiles and data represents the urgent next step for countries as they are designing national and sectoral implementation strategies. The rapid proliferation of national and corporate net zero strategies are a welcome development: By mid-2022, more than 130 countries had announced net zero targets and strategies, covering close to 90% of global emissions. These targets and strategies, however, vary greatly in their sophistication and credibility: As the analysis by the Climate Action Tracker found, only a total of six of the 41 countries it reviewed have defined net zero targets in a manner could be rated as 'acceptable' in terms of scope, architecture, and transparency. Together these six countries are only responsible for 8% of global GHG emissions (Climate Action Tracker 2022; UNEP 2022).

In contrast to NDCs with targets for the end of the current decade, **net zero commitments** for mid-century represent little risk for current government leaders. Announcements of net zero targets for 2050 are seen by some as "cheap talk", and as "blababla" (including Greta Thunberg, 2021) and as a distraction from the need for more urgent short-term action to reduce emissions in the immediate future. Against the background of new models and projections presented by the IPCC earlier this year, all countries are now expected to develop both: a credible, action-focused NDC that sets (sectoral) targets and policy priorities for practical implementation in the short-to-medium term; and evidence-based, longer-term strategies and national pathways based on specific national circumstances, profiles and data that link the short term with the necessary systemic changes over the longer term.

Box 5. The role of AFOLU for reaching net zero

Pathways compatible with the Paris Agreement need to achieve carbon neutrality – net zero CO_2 – by 2050, with the word "net" indicating that residual emissions are possible as long as they are offset by removals. Beyond this, the world needs to see net negative CO_2 emissions alongside significant reductions in other GHG emissions in order to achieve actual climate neutrality – net zero GHG Emissions – ideally by 2070. This was confirmed in consecutive reports by the Intergovernmental Panel on Climate Change (IPCC), most recently in early 2022. Countries thus need to rapidly decarbonize their energy systems and extend carbon sinks wherever they exist to offset residual emissions. Consequently, this means that global LULUCF emissions must be net negative by 2050, and global emissions from agriculture to be cut significantly.

At country level, however, the task of setting targets is more complex as the properties of the AFOLU sector differ strongly across countries – with different emission profiles and potentials to mitigate or sequester carbon. There is and cannot be one solution that fits all circumstances. Across all countries, and all instruments – including NDCs for the short and medium-term, but also for longer term strategies – it is critical to integrate the AFOLU sector and include an evidence-based differentiation of action pathways. For this, the FABLE Consortium has developed a set of criteria, namely food consumption patterns, land-based CO_2 removal potential, and AFOLU emission patterns, to differentiate country types that share relevant food and land use system properties. For each of these types, FABLE proposed and matched tailored sets of actions for countries to prioritize in their national pathways to maximize the reduction of AFOLU emissions.

Two examples to illustrate the implications and practical policy value of this approach: (1) Countries characterized by excessive food consumption alongside a substantial potential for carbon removal on land, need to focus on expanding their existing land sink capacities as well as reducing their livestock and crop emissions. (2) Countries characterised by food and nutritional insecurity need to focus on stabilising livestock and crop emissions without further converting land into agricultural use.

The proposed typology of these data-derived country profiles for the development of differentiated national pathways is outlined in a separate policy brief, issued by the Food and Land Use Coalition (FOLU). The brief also included case studies for Argentina, Ethiopia, India, and the US.

Source: FABLE 2022

Take-aways and outlook

1. **Countries need to consistently include agriculture, food and land sectors** in the development of their NDCs. This extends also to related national strategies, operational planning documents and programmes, especially in countries that have the highest AFOLU emissions, as well as others with significant potential for carbon removal and sequestration.

2. **Countries need to develop their NDCs based on evidence** and actual emission profiles. As a consequence, national targets and pathways will inevitably vary across countries, but this makes NDCs and net zero strategies more relevant and conducive for implementation.

3. **Processes matter, as does the involvement of stakeholders.** If NDCs are to play their central role for driving coordinated action under the Paris Agreement, they need to do more than just provide policy directions. They need to integrate policy dialogue, inclusive consultations and planning processes within the respective governance and sector contexts.

4. **National and sectoral targets for mitigation and adaptation** action can be instrumental in setting country ambition and driving focus on action. The lack of sectoral targets especially in the NDCs of high-emitting countries, such as for emissions from agriculture or sustainable consumption levels, represents political failure but also opportunities.

5. **Credible NDCs and commitments** depend on transparency regarding the "how" and "what" countries are doing or planning for the achievement of their targets. Concrete policy initiatives and clearly defined implementation responsibilities present important aspects of accountability, and a basis for joint learning across countries and sectors.

6. **Countries need to integrate and align their short- and long-term planning.** NDCs, national adaptation plans and net zero strategies need to align for a shared focus on concrete action plans, operational implementation processes and adequate financing.

7. **NDC processes cannot replace actual planning.** Countries need to complement NDCs with national roadmaps as part of a coordinated whole-of-government effort to operationalise national and international commitments in the context of existing national planning and financing frameworks.

8. **Countries need to focus now on the practicalities of implementation.** Not in the NDCs in their next iteration, but in the domestic strategic and operational planning processes to link targets with policies, instruments and interventions – as well as financing and appropriate mechanisms for monitoring and cross-sectoral coordination.

9. **NDC and national strategies need to identify the estimated costs of implementation.** Currently, few NDCs doe this beyond specific sectors, including for food and land use. Developing countries need to consider NDCs as platforms for presenting national visions and programmes for mitigation and adaptation, as well as the mobilization of external financing.

10. **Action and reviews of countries' actual progress need to shift to countries.** Assessments of NDCs, their commitments and actual implementation into action cannot be done from outside and through desk reviews but requires engagement in countries. NDCs need to be localised and linked with existing national and sectoral platforms and processes for policy dialogue, and be integrated with mainstream national development and budget frameworks.

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Photo/image information

Page 4. Land leveling at the Saga village. Community forest management, Narmada Gujarat (ARCH and members of the Kanji village; WRI India).

Page 9. Aerial view of agriculture in Africa by Jan Ziegler.

Page 17. Olive trees plantation in Jordan by Damian Pankowiec.

Page 27. Germination room in the greenhouses at Gullele Botanical Gardens, Addis Ababa, Ethiopia. Conservation and biodiversity work, encouraging native species growing in Ethiopia (Gullele Botanical Garden; WRI Africa).

Page 30. Farmer watering pear trees at Shared Harvest. Community-Supported Agriculture with the woman-led Shared Harvest in the Beijing area (Shared Harvest; Tsinghua University; WRI China).

Annex

Annex A. Overview of targets contained in the 24 NDCs analysed for this brief

Country	Analysed NDC	Overall target(s)	Sectoral target(s) for agriculture	Sectoral target(s) for LULUCF	Climate Action Tracker rating (2022)
G20 countries					
Argentina	ARG2021	Absolute target: economy-wide and unconditional goal of not exceeding the net emission of 359 $MtCO_2e$ in 2030 (LULUCF included)	None	None	**Highly insufficient**
Australia	AUS2022	Raised ambition for the 2030 target: Reduction of GHG emissions to 43% below 2005 levels, by 2030	None	None	**Insufficient**
Brazil	BRA2022	Absolute targets: economy-wide to reduce net GHG emissions by 37% and 43% below 2005 levels in 2025 and 2030 (LULUCF included)	None	None	**Insufficient**
Canada	CAN2021	Economy-wide target to reduce its GHG emissions by 40-45% below 2005 levels by 2030 (LULUCF included)	Reduction of emissions from fertilisers by 30% below 2020 levels by 2030	None	**Highly insufficient**
China	CHI2021	Reduction of CO_2 emissions per unit of GDP by 2030, by over 65% from the 2005 level	None	Increase forest stock volume by 6 billion cubic meters, by 2030, from 2005 level	**Highly insufficient**
European Union	EU2020	Binding target of a net domestic reduction of at least 55% in GHG emissions by 2030 compared to 1990 (LULUCF included)	None	None	**Insufficient**
India	IND2022	Reduction of emissions intensity by 45% by 2030 compared to 2005 levels	None	Creation of an additional carbon sink of 2.5-3 billion tons of CO_2 equivalent through additional forest and tree cover by 2030	**Highly insufficient**
Indonesia	IDN2022	Reduction of GHG emissions by 31.9% compared to BAU scenario by 2030, and up to 43.2% (conditional)	Reduction of emissions by 0.3% (unconditional) and 0.4% (conditional) below BAU.Detailed targets are described for three scenarios (BAU, unconditional mitigation and conditional mitigation)	Reduction of emissions by 17.4% (unconditional) and 25.4% (conditional) below BAU. Restoration of 2m ha of peatlands and rehabilitation of 12m ha of degraded forests by 2030. Detailed targets and actions are described for three scenarios (BAU, unconditional mitigation and conditional mitigation).	**Highly insufficient**

Country	Analysed NDC	Overall target(s)	Sectoral target(s) for agriculture	Sectoral target(s) for LULUCF	Climate Action Tracker rating (2022)
G20 countries					
Japan	JPN2021	Reduction of 26% by fiscal year 2030 compared to FY 2013, amounting to approximately 1.042 billion t-CO_2 eq. as 2030 emissions (LULUCF included)	None	Reduction of LULUCF emissions by 37MtCO_2 by 2030	**Insufficient**
Republic of Korea	ROK2020	Reduction of GHG emissions by 24.4%, by 2030 compared to 2017 levels	None	None	**Highly insufficient**
Mexico	MEX2020	Reduction of 22% of GHG and 51% of black carbon emissions (unconditional), and up to 36% of GHG and 70% of black carbon emissions (conditional) by 2030 compared to BAU	None	None	**Highly insufficient**
Russian Federation	RF2020	Reduction of GHG emissions by 2030 to 70% relative to 1990 (LULUCF included)	None	None	**Critically insufficient**
Saudi Arabia	SAU2021	Increased ambition of its 2030 emission reduction target from 130 MtCO_2e to 278 MtCO_2e	None	None	**Highly insufficient**
South Africa	SA2021	Emissions by 2025 and 2030 will be in a range between 398 and 614 MtCO_2e as defined in national policy (AFOLU included)	None	None	**Insufficient**
Türkiye	TUR2021	Reduction of 21% in GHG emissions from BAU level by 2030 (LULUCF included)	None	None	**Critically insufficient**
United Kingdom	UK2020, UK2022	Reduction of economy wide GHG emissions by at least 68% by 2030 compared to 1990 levels (LULUCF included)	None	None	**Almost sufficient**
United States of America	USA2021	Economy-wide reduction target of net GHG emissions by 50-52% below 2005 levels in 2030 (LULUCF included). The non-GHG target is to reach 100% carbon pollution-free electricity by 2035	None	None	**Insufficient**

Country	Analysed NDC	Overall target(s)	Sectoral target(s) for agriculture	Sectoral target(s) for LULUCF	Climate Action Tracker rating (2022)
Non-G20 countries					
Colombia	COL2020	Colombia commits to maximum of 169.44 $MtCO_2e$ in 2030 (equivalent to 51% reduction compared to BAU) and reduce black carbon emissions by 40% compared to 2014 in 2030 (LULUCF included).	Dedication of 3.6m ha to sustainable livestock raising. Increase in surface areas for cocoa production under agroforestry (150,000 ha) and under restoration (80,000 ha). 255,000 ha of irrigated rice and 207,046ha of dry rice planted with new technology (AMTEC 2.0). Planting of 936,477 ha of coffee under NAMA Café strategy. Conversion of 15,000 mills to latest technologies.	Plant 27,282 ha of trees for commercial uses	**Highly insufficient**
Democratic Republic of the Congo	DRC2021	The DRC commits to a combined unconditional and conditional contribution of up to 21% reduction in total GHG emissions compared to the BAU in 2030 (19% conditional and 2% unconditional) equivalent to an estimated mitigation level of up to 650 Mt CO_2e by 2030	Reduction of emissions, potentially by 180-187 $MtCO_2e$	Reduction of emissions, potentially by 182-192 $MtCO_2e$	**N/A (not covered by the Climate Action Tracker analysis)**
Egypt	EGY2022	Egypt commits to reducing its electricity emissions by 33%, its oil and gas emissions by 65%, and its transport emissions by 7% by 2030 relative to BAU	None	None	**Highly insufficient**
Ethiopia	ETH2021	Ethiopia commits to reduce GHG emissions by 14% (unconditional) and 68.8% (conditional) by 2030 compared to BAU	Reduction of emissions by 0.92% (unconditionally), and up to 7.6% (conditionally)	Reduction of emissions by 34.6% (unconditionally), and up to 171% (conditionally)	**Almost sufficient**
Ghana	GHA2021	To generate absolute greenhouse gas (GHG) emission reductions of 64 $MtCO_2e$ (conditional and unconditional)	None	None	**N/A (not covered by the Climate Action Tracker analysis)**
Kenya	KEN2020	To reduce GHG emissions by 32% by 2030 relative to the BAU scenario of 143 $MtCO_2e$ (21% unconditional. 79% conditional on international support)	None in the immediate NDC document, but associated documents of the Government (GoKenya 2021, p.7) refers to forestry and agriculture emission reduction potentials.	By 2030: 10% tree cover; Land degradation neutrality. Quantitative targets for adaptation: land for nature-based solutions, land for forest plantation, agroforestry, trees and more	**Almost sufficient**
United Arab Emirates	UAE2022	To reduce GHG emissions by 31%, measured in CO_2e, relative to BAU in 2030.	Cut food waste in half by 2030.	Plant 100 million mangrove seedlings by 2030.	**Highly insufficient**

Note: US NDC is considered first NDC after re-joining the Paris Agreement in 2020; N/A stands for not available.
Source: UNFCCC 2022a and Climate Action Tracker 2022

Annex B: Emission from agriculture, LULUCF, AFOLU for countries in this analysis

Table B.1 Country characteristics and emissions, by income status

Country	Income group	Population (in million)	TOTAL national GHG emissions (in $MtCO_2e$)	NATIONAL share of global GHG emissions (% of global)	NATIONAL emissions from agriculture (in $MtCO_2e$)	NATIONAL emissions from LULUCF (in $MtCO_2e$)	NATIONAL emissions from AFOLU (in $MtCO_2e$)	AFOLU share of national emissions (% of national)
G20 countries								
India	Lower Middle-Income	1,393	3,360	7%	756	-31	724	22%
Indonesia	Lower Middle-Income	276	1,960	3%	178	969	1,147	59%
Argentina	Upper Middle-Income	46	398	<1%	136	30	166	42%
Brazil	Upper Middle-Income	214	1,306	3%	526	394	920	70%
China	Upper Middle-Income	1,412	12,065	24%	667	-650 (neg)	18	<<1%
Mexico	Upper Middle-Income	130	671	1%	102	17	119	18%
Russian Federation	Upper Middle-Income	143	1,920	1%	97	-552 (neg)	-455 (neg)	-24% (neg)
South Africa	Upper Middle-Income	60	562	1%	29	7	36	6%
Türkiye	Upper Middle-Income	85	460	<1%	52	-29 (neg)	24	5%
Australia	High Income	26	608	1%	129	23	151	25%
Canada	High Income	38	774	1%	57	37	94	12%
Japan	High Income	126	1,160	2%	23	-32 (neg)	-9 (neg)	-1% (neg)
Republic of Korea	High Income	52	653	1%	15	-46 (neg)	-31 (neg)	-5% (neg)
Saudi Arabia	High Income	35	723	4%	7	0	7	<1%
United Kingdom	High Income	67	429	<1%	51	-11 (neg)	40	9%
United States of America	High Income	331	5,769	12%	386	-230 (neg)	156	3%
European Union	n/a	447	3,645	7%	391	-234 (neg)	157	4%
Non-G20 countries								
DR of the Congo	Low income	92	680	1%	27	625	652	96%
Ethiopia	Low income	117	183	<1%	117	32	149	81%
Egypt	Lower Middle-Income	104	352	<1%	33	<<1%	33	9%
Ghana	Lower Middle-Income	32	13	<<1%	10	-25 (neg)	-15 (neg)	-114% (neg)
Kenya	Lower Middle-Income	55	73	<<1%	53	-8 (neg)	45	62%
Colombia	Upper Middle-Income	51	271	<1%	69	83	152	56%
United Arab Emirates	High income	10	244	<1%	2	0	2	<1%

Note: Income group and population from World Bank (2022). Data on emissions from FAOSTAT; Data on the share of GHG from Climate Watch. Highlights by the authors. Source: Authors based on World Bank 2022, FAOSTAT 2022 and WRI/Climate Watch 2022.

Table B.2 Ranking of national AFOLU emissions, countries covered in this NDC analysis

	Country		Absolute AFOLU emissions (in $MtCO_2e$)	Relative share of global AFOLU (in percent)	Relative share of AFOLU in national GHG (in percent)	Relative share of agriculture in national GHG (in percent)
1	**Indonesia**	G20	1,147.15	15.17	58.53	9.08
2	**Brazil**	G20	920.08	12.16	70.47	40.27
3	**India**	G20	724.25	9.58	21.56	22.49
4	**DR of the Congo**		651.51	8.61	95.87	3.97
5	**Argentina**	G20	165.64	2.19	41.52	34.04
6	**European Union**	G20	156.86	2.07	4.30	10.72
7	**United States**	G20	155.98	2.06	2.70	6.69
8	**Colombia**		151.73	2.01	56.09	25.34
9	**Australia**	G20	151.21	2.00	24.85	21.15
10	**Ethiopia**		149.38	1.97	81.46	63.79
11	**Mexico**	G20	118.60	1.57	17.68	15.15
12	**Canada**	G20	94.08	1.24	12.15	7.33
13	**Kenya**		45.30	0.60	61.72	72.09
14	**United Kingdom**	G20	40.34	0.53	9.40	11.95
15	**South Africa**	G20	35.94	0.48	6.39	5.19
16	**Egypt**		32.92	0.44	9.35	9.30
17	**Türkiye**	G20	23.87	0.32	5.19	11.41
18	**China**	G20	17.78	0.24	0.15	5.53
19	**Saudi Arabia**	G20	6.63	0.09	0.92	0.92
20	**United Arab Emirates**		2.14	0.03	0.88	0.88
21	**Japan**	G20	-9.18 (neg)	-0.12 (neg)	-0.79 (neg)	1.97
22	**Ghana**		-14.55 (neg)	-0.19 (neg)	-114.12 (neg)	81.18
23	**Republic of Korea**	G20	-30.95 (neg)	-0.41 (neg)	-4.74 (neg)	2.27
24	**Russian Federation**	G20	-454.88 (neg)	-6.01 (neg)	-23.69 (neg)	5.06

Sources: authors based on FAOSTAT 2022 and ClimateWatch 2022. Figures do not consider the size of agricultural areas in the respective countries.
Note: data on GHG emissions from ClimateWatch. Data on AFOLU emissions from FAOSTAT. Data on relative shares calculated by the authors.
Shaded rows indicate NDCs with sectoral targets For global ranking beyond countries covered in this analysis, see table 5 in chapter 3.

Annex C. Methodology applied as part of this NDC analysis

This annex summarises the refined methodological approach applied by the FELD team in the updated and expanded 2022 analysis of the NDCs, as presented in Chapters 2 and 3 of this brief.

Assessment A: Food and land use-related policy priorities in the NDCs (Chapter 2)

The analysis conducted in Chapter 2 reviewed the set of 24 NDCs for food and land-use related actions and priorities across relevant sectors and mapped them against the FOLU Critical Transitions framework as presented in its Growing Better report (FOLU 2019). References to specific policy initiatives and interventions were compared to the "essential actions" associated with key transitions toward sustainable food and land use. These were defined as expressions of a country's intention to undertake specific actions with regard to the critical transitions as per Growing Better and other relevant studies (Strassburg 2020). FOLU's definition of the essential actions and critical transitions takes a holistic approach to the transformation of food and land-use, understanding that reforms will differ from country to country.

Table C.1 Essential actions for the transformation of food and land use (based on FOLU 2019)

Critical Transition	**Essential Actions** and policy interventions
Healthy Diets	• Shift to healthy diets • Healthy dietary standards/policies • Repurposed agricultural away from unhealthy foods
Productive and Regenerative Agriculture	• Payments for ecosystem services • Agro-biodiversity, including regenerative agriculture, agroforestry, agroecosystem, regenerative farming, no-till, cover crops • Training, financing, and access to technology for agriculture
Protecting and Restoring Nature	• Halting the conversion of natural ecosystems • Ecosystem restoration • Sustainable forest management • Legal land rights to Indigenous peoples • Scale up of REDD+ approaches • Deforestation-free supply chains • Nature-based solutions approaches
Healthy and Productive Oceans	• Protect breeding grounds • End illegal, unregulated, and overfishing • Compensate fishermen for the cost of fish stock recovery • Ocean and coastal protection and conservation
Diversified Diversified Protein Supply	• Diversified or alternative protein products
Reduced Food Loss and Waste	• National strategies with explicit targets to reduce food loss and waste • Climate-smart storage technologies
Local Loops and Linkages	• Investments in emerging technology to close food system loop • Fostering of local circular economy
Harnessing the Digital Revolution	• Open access to data (e.g. on land, fisheries, agriculture) • Tools to track deforestation, illegal fishing, environmental crime, etc. • Monitoring, reporting and verification of food and land-use systems • Innovative technology in the AFOLU sector
Stronger Rural Livelihoods	• Provision of training to farmers and rural communities • Safety nets and support for individuals and communities to ensure a just transition • Scale up of roads and digital investments to drive productivity • Access to renewable electricity access for all
Gender and Demography	• Investments in maternal and child health and nutrition • Education for women and girls • Access to reproductive health services • Gender-informed policies

In the application of this framework, NDCs were analysed on the basis of systematic keyword searches; findings were further differentiated according to whether mentions to essential actions or critical transitions were merely nominal in nature, e.g. as part of general statements or lists, or whether they were part of actual commitments or otherwise carried operational meaning. The objective was not to code "mere mentions" the same way as references that included relevant implications for the country's NDC and climate action.

- **"No mention"** (coded red in Table 2a) indicates the absence of any reference or commitment related to the respective critical transition and its associated interventions.
- **"Nominal reference"** (coded orange) indicates the presence of relevant language in the NDC but without practical or political relevance for the country's action, including as part of general lists, introductions and nominal references to external processes or as part of UNFCCC templates.
- **"Essential action"** (coded green) indicates critical transitions that NDCs address explicitly, including with references to policy initiatives and related essential actions as listed below.

Examples for the practical distinction of these categories of reference are included below. Based on feedback to the 2021 analysis the FELD team reviewed and subsequently clarified its methods further for a refined assessment in 2022. This affected especially the analysis and coding of NDCs for Critical Transitions 6, 7, 8 and 9 for which the team refined the criteria and undertook deeper analysis to determine whether references to relevant policy areas and actions were indeed in line with the relevant critical transition.

- **Transition 6** on "food loss and waste": In contrast to the 2021 review where general references and commitments to waste management were seen as indicative for commitments to this critical transition, the team now checked more closely if NDCs included any explicit reference to food-related loss and waste.
- **Transition 7** on "local loops and linkages": In the 2021 review, all references related to the notion of a circular economy were seen as broadly indicative of the transition. In this new iteration, the team checked more closely if relevant statements pointed specifically to the inclusion of food systems and local food economies.
- **Transition 8** on "harnessing the digital revolution": The previous analysis of NDCs applied more generic criteria which included references to innovative technologies and (digital) monitoring, reporting and verification (MRV), or Monitoring and Evaluation frameworks. In the updated assessment the coding was limited to cases where these initiatives are explicitly linked to food and land use sectors, and their digitalisation.
- **Transition 9** on "stronger rural livelihoods": In the previous assessment NDCs were analysed for references to a just transition and aspects of inclusivity, even in the absence of links to rural communities and livelihoods. In the refined assessment this was changed and limited to NDCs that point explicitly at or focused on rural areas.

Assessment B: NDC focus on action to transform food and land use (Chapter 3)

The analysis presented in Chapter 3 aims at assessing the food and land-related commitments and targets in the NDCs for their focus on action and indication of a conducive policy context for the operationalisation of these commitments, including aspects of financing, (land use) planning and technologies. This section provides an explanation of the five criteria and the assessment method used in this analysis, as refined on the basis of the 2021 analysis.

The definition of the criteria was based on relevant policy and implementation-focused literature, as well as the IPCC's 2019 Special Report on Climate Change and Land which identified key barriers to the implementation of mitigation and adaptation options in the land sector. These include financial and institutional barriers, skills deficit, absence of incentives, access to relevant technologies, consumer awareness and the limited spatial scale at which the success of these practices and methods have been demonstrated (Shukla et al. 2019).
Roe et al. (2019) also describe how "major barriers to delivering AFOLU mitigation include political inertia, weak governance, and lack of finance" (Roe et al. 2019). A related methodology was also applied in UNDP's 2021 "State of Climate Ambition" analysis (UNDP 2021). The present FELD analysis represents a simplified methodology for the assessment of NDCs' focus on action and conditions for policy and implementation follow up.

A. **Do NDCs specify commitments, targets and policy priorities for (a) agriculture and food, and (b) land use, land-use change and forestry (LULUCF)?** NDCs were reviewed for their commitments, including targets, policy priorities and other actions for the food and land sector. In recent years, detailed assessments of the first round of NDCs had shown that they were off track (IPCC 2018a; UNEP 2020, UNEP 2022) and lacked the clear information necessary to understand what land-based mitigation was anticipated, specifically in the LULUCF sector. Earlier studies had shown that only few NDCs had reported targets and measures for food and land use that were fully quantifiable and action-oriented (Fyson and Jeffery 2019). Subsectors of the agriculture and food sector analysed here include all relevant areas of the food system on both the supply and demand side, including transitions in crop production, livestock, food systems, as well as sustainable land management practices. Examples for the LULUCF sector include the drivers of deforestation, afforestation and reforestation measures, protection and restoration measures of peatlands, wetlands, grasslands and other types of land.

B. **Do NDCs connect commitments with the countries' existing policy contexts related to the food and land sector?** The indication of policy directions and specific identification of policy measures within their respective policy contexts and linkages with existing policies are important aspects for determining the extent to which NDCs are action oriented and conducive to follow up and implementation. The team reviewed NDCs for the connection and linkages of commitments with policies, including cross-sectoral initiatives, existing or planned, for the food and land sector.

C. **Do NDCs identify financial resources committed, allocated or required, for the implementation of indicated policies and actions in the food and land sector?** The analysis reviewed the inclusion of references in the NDCs related to the financing of the transitions and policies necessary, and whether they provide information on national public financing instruments or international financing needs to support the stated transitions in the food and land sector- with a focus on public sector finance commitments, allocations or requirements to implement action in the food and land sector as outlined in the NDCs. For the updated 2022 analysis this explicitly includes the expression of financing needs from international sources, but not references and aspects of private finance. The inclusion of finance information is important as it can facilitate international green financial flows towards actions in the food and land sector.

D. **Do NDCs consider aspects of land use planning and spatial information related to the operationalisation of policies to deliver national commitments?** Policy-related aspects of land use planning are important for the effective operationalisation of policies related to food and land use. Countries need nationally relevant spatial data to identify threats and priority areas for conservation and restoration that underpin nature-based solutions and to identify mitigation potential from different land-use changes. The acknowledgement and integration of key aspects of land management and planning in NDCs can facilitate the effective operationalisation of policies at central and subnational level in countries.

E. **Do NDCs indicate technological development, transfer, investments, and capacity building needed to implement change?** The development and transfer of existing, new, and emerging technologies can support the transitions needed in the food and land sector. NDCs provide an opportunity to indicate technology priorities and needs, and focus areas for technological development needs or plans related to agriculture, food or LULUCF. Technology has been identified as an obstacle for the implementation of mitigation actions in the food and land sector (Smith et al. 2019). And while social and economic drivers are seen as primary drivers of change, the wide-scale application in the near term of potential mitigation responses in the land sector may be limited by technological barriers (Smith et al. 2019).

Based on the criteria spelled out in the legend on page 23 (for a detailed version see additional documentation on the FELD website), the FELD team analysed the set of 24 NDCs for the indication of relevant aspects, with ratings ranging from "absent/unclear", "not conducive to action", "conducive to action" to "action-focused" (see Table 3a). The rating of "absent or unclear" indicates that an NDC doesn't include any relevant or only unclear information; a rating of "not conducive to action" typically indicates when NDCs include simple mentions or merely include generic information; in contrast, a "conducive to action" rating identifies NDC with action-relevant references for at least some aspects and (sub)sectors; and a rating of "action-focused" confirms NDC with explicit concerns for action, implementation and follow up. As stated elsewhere in this brief: the Team did not undertake an assessment of the actual implementation status and progress in countries, but sees the desk reviews and this analysis as a basis for discussions with in-country FOLU partners and national stakeholders.

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