

# **Supplementary materials – National planning mechanisms and country case studies**

## **Increasing ambition in Nationally Determined Contributions through agriculture and food systems innovation**

### **Evidence, foundational analysis, and recommendations for NDCs**

Developed through a collaboration between the United Nations Foundation and Climate Focus  
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## Context: National tools and mechanisms

National governments have a range of tools and mechanisms at their disposal to enhance climate-aligned agriculture and food systems innovation (see Table 1).

*Table 1. National tools and mechanisms to support agriculture and food systems innovation.*

| Tool  | Description   |
|---|---|
| <b>National agricultural policies</b>             | Governments put forward their priorities for the agriculture sector through national agricultural policies, which can underscore the importance of innovation, delineate strategic objectives, incentivize technology adoption, and allocate resources to support agricultural R&D and extension services.  |
| <b>Research and development (R&amp;D) funding</b> | Through grants, contracts, and other mechanisms, governments can directly invest in agricultural research institutions, universities, and private sector entities to support development of new knowledge and improvement of technologies and practices.  |
| <b>Tax incentives</b>                             | Governments can provide research tax credits and other tax incentives to encourage private investment in agriculture and food systems innovation. By offsetting R&D expenses, research tax credits can stimulate innovation in areas such as crop and livestock improvement, precision farming, sustainable practices, and food processing and packaging. To reduce taxable income and encourage investment in new technologies, governments may provide accelerated depreciation provisions for research equipment.  |
| <b>Public-private partnerships (PPPs)</b>         | Governments can foster collaborative research, technology transfer, and knowledge sharing among public research institutions, private companies, and non-profit organizations through PPPs. By enabling risk sharing and resource pooling, PPPs can facilitate co-investment in high-risk / high-reward projects that might otherwise not be feasible.  |
| <b>Extension services</b>                         | Governments can invest in agricultural extension services (e.g., information dissemination; training; advisory support) to encourage on-farm innovation including adopting or adapting climate-smart technologies and practices.  |
| <b>Additional support mechanisms</b>              | To create an enabling environment for agricultural research and innovation, governments can employ various supportive mechanisms such as: <ul style="list-style-type: none"> <li>▪ Policy and regulatory support (e.g., revising intellectual property rights to encourage invention by private entities; streamlining regulatory processes to accelerate approval of new agricultural technologies)</li> <li>▪ Capacity building (e.g., delivering education and training programs to develop a skilled workforce for agricultural R&amp;D)</li> <li>▪ Infrastructure development (e.g., state-of-the-art research facilities and field stations; digital capacity for precision agriculture)</li> </ul> |
| <b>International research collaboration</b>       | Through participation in joint research projects, exchange of scientific expertise, and support for international agricultural development organizations, governments can share knowledge, best practices, and resources for agriculture and food systems innovation.   |

Governments can also promote agriculture and food systems innovation by including related measures in national planning and reporting mechanisms that feed into United Nations conventions and processes (see Table 2). Harmonizing measures included in these several types of planning and reporting mechanisms can facilitate coherent, effective implementation.

*Table 2. National planning and reporting mechanisms that feed into international frameworks.*

| Mechanism   | Background   |
|---|--|
| <b>United Nations Framework Convention on Climate Change (UNFCCC)</b>         |  |
| <b>Nationally Determined Contributions (NDCs)</b>                             | Each Party to the <b>Paris Agreement</b> is required to prepare, communicate, and maintain successive <b>Nationally Determined Contributions (NDCs)</b> that embody their efforts to reduce national greenhouse (GHG) emissions and adapt and build resilience to the impacts of climate change. As part of the mechanism to ratchet up efforts agreed in 2023 under the Global Stocktake, countries are revising and enhancing their NDCs for the next round of submissions, due in 2025.   |
| <b>National Adaptation Plans (NAPs)</b>                                       | <p>The Conference of the Parties (COP) to the UNFCCC acknowledged that national adaptation planning can enable countries to assess their vulnerabilities, mainstream climate change risks, and address adaptation. The <b>objectives</b> of the NAP process are: (a) To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; (b) To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate (decision 5/CP.17, paragraph 1). The Least Developed Countries Expert Group (LEG) of the UNFCCC is tasked with providing <b>technical guidance</b> and support to the NAP process, and with preparing <a href="#">technical guidelines</a>.<sup>1</sup></p> <p>Established in 2010, the <b>process</b> for formulating and putting NAPs into action serves as the primary method to coordinate and drive the climate actions of all actors and stakeholders in pursuit of adaptation goals at a national level. It follows a continuous, progressive, and iterative process that should be country-driven, gender-sensitive, participatory, and fully transparent. The first ever NAP was submitted by Burkina Faso in 2015. As of December 2023, 52 NAPs have been received from developing countries and over 142 developing countries are undertaking measures to formulate and implement NAPs.<sup>2</sup></p> |
| <b>Long-term low greenhouse gas emission development strategies (LT-LEDS)</b> | All Parties to the UNFCCC should strive to formulate and communicate <b>long-term low greenhouse gas emission development strategies (LT-LEDS)</b> , in accordance with Article 4, paragraph 19 of the Paris Agreement. As of April 2024, 72 Parties have submitted their strategies and all other Parties are urged to communicate or revise their long-term low greenhouse gas emission development strategies by November 2024. <sup>3</sup> A synthesis report of submitted LT-LEDS prepared by the Secretariat highlights that terrestrial and wetland ecosystems (81% of LT-LEDS) together with <b>food security and production</b> (76%), which includes agriculture, livestock and fisheries, were the <b>highest priority for adaptation</b> in countries' long-term strategies. <sup>4</sup> In addition, a number of LT-LEDS note the need to strengthen "international cooperation to accelerate the deployment and application of cutting-edge, critical and disruptive technologies, including through joint planning and the mainstreaming of   |

| Mechanism  | Background  |
|--|---|
|  | <b>technological innovation.</b> <sup>5</sup> Governments can take the opportunity to submit new LT-LEDS by COP 29 with a view to incorporating research and innovation priorities in the agriculture sector.   |
| <b>United Nations Convention on Biological Diversity (CBD)</b>     |   |
| <b>National Biodiversity Strategies and Action Plans (NBSAPs)</b>  | <p>The United Nations Convention on Biological Diversity (UNCBD), established in December 1993<sup>6</sup> and ratified by 196 nations, is dedicated to "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources."<sup>7</sup> The <b>Kunming-Montreal Global Biodiversity Framework (GBF)</b> is a landmark outcome of the 2022 UNCBD Conference, COP15,<sup>8</sup> which sets forth 2030 goals including conserving 30% of land, sea, and inland waters, restoring 30% of ecosystems that have been degraded, and reducing harmful subsidies by \$500 billion annually.<sup>9</sup></p> <p><b>National biodiversity strategies and action plans (NBSAPs)</b>, the main instruments for national implementation of the Framework,<sup>10</sup> will reflect how the country intends to fulfill the objectives of the Convention in light of specific national circumstances, and the related action plans will constitute the sequence of steps to be taken to meet these goals.<sup>11</sup> A specific NBSAP <b>submission timeframe</b> was established for the first time by COP10 in 2010. In decision 15/6, COP15 requested Parties to submit their revised and updated NBSAPs, aligned with the Kunming-Montreal Global Biodiversity Framework, by COP16.<sup>12</sup> To date 194 of 196 Parties have developed at least one NBSAP.<sup>13</sup> In addition to NBSAPs, <b>national reports</b> are critical instruments to enable monitoring and review of the implementation of the convention on a global level, According to decision 15/6, Parties are requested to submit their seventh national report by 28 February 2026 and their eighth national report by 30 June 2029 to enable the preparation of the global reviews.<sup>14</sup></p> <p>Countries have a variety of <b>tools and resources</b> at their disposal to implement their NBSAPs. As an example, the NBSAP Forum is a global partnership aiming to support countries in implementing the UN CBD and its strategic plans, including global biodiversity targets. The Forum is hosted by the Secretariat of the Convention on Biological Diversity (SCBD), the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP), through funding provided by the Global Environmental Facility (GEF).<sup>15</sup></p> |
| <b>United Nations Convention to Combat Desertification (UNCCD)</b> |   |
| <b>National Action Programmes (NAPs)</b>                           | <p>Established in 1994 as the only legally binding framework set up to address <b>desertification</b> and the effects of <b>drought</b>, the UNCCD promotes practices that avoid, reduce, and reverse land degradation and is the driving force behind Sustainable Development Goal 15 and Land Degradation Neutrality.<sup>16</sup> There are 197 Parties to the Convention, including 196 country Parties and the European Union.<sup>17</sup></p> <p><b>National action programmes (NAPs)</b> are key instruments for UNCCD implementation developed with participation by relevant governmental offices, scientific institutions, local communities, and other stakeholders. They spell out practical steps and measures to be taken to combat desertification in specific ecosystems. Since the adoption of the UNCCD's 10 Year Strategy in 2007, a number of affected countries have started the process of aligning their national action programmes with the</p>  |

| Mechanism                                      | Background   |
|--|--|
|  | Strategy. Additionally, the alignment of the sub-regional and regional action programmes has also been initiated. <sup>18</sup>  |
| <b>National Drought Plans</b>                  | Since 2108, the UNCCD's <b>Drought Initiative</b> assists countries with a Drought Toolbox, which provides tools, case studies, and other resources to support the design of countries' <b>National Drought Plans</b> with the aim of boosting the resilience of people and ecosystems to drought. <sup>19</sup> The UNCCD is currently helping 70 drought-prone countries to establish drought-smart strategies and drought risk management frameworks based on early warning and monitoring systems, vulnerability and impact assessments, and drought risk mitigation measures. <sup>20</sup> No timeframe or deadlines are specified for national Drought Plans. Some countries have opted to incorporate National Drought Plans into National Development Plans, such as Cambodia and Ghana. <sup>21</sup>  |
| <b>2030 Agenda for Sustainable Development</b> |  |
| <b>National Development Plans (NDPs)</b>       | Toward the 2030 Agenda, the <b>Sustainable Development Goals (SDGs)</b> are integrated and indivisible, addressing the economic, social, and environmental dimensions of sustainability. Achieving an integrated approach involves identifying synergies and trade-offs between SDGs and their associated targets as well as pursuing context-specific implementation. <sup>22</sup> A <b>national development plan (NDP)</b> outlines a country's strategic direction, development priorities, and implementation strategies and is typically formulated through a national consensus process. It provides the institutional framework and foundation for other policy documents, such as budget plans, investment plans, and implementation processes, and for monitoring. The number of countries with an NDP has more than doubled between 2006 and 2018, from 62 to 134. <sup>23</sup> This increase can be attributed to: (i) countries benefitting from the Heavily Indebted Poor Countries Initiative and Poverty Reduction Strategy Papers to build state capacity and, therefore, plan for the future; (ig) Governments are using NDPs to respond to various international agreements and global agendas (e.g., the Paris Agreement and SDGs); (iii) some governments use NDPs to respond to the risks of globalization and economic liberalization policies; (iv) high-income countries depend on NDPs as a tool for monitoring. Few states utilize NDPs to promote the national agenda against the international development agenda. <sup>24</sup> |
| <b>Voluntary National Reviews (VNRs)</b>       | As part of its follow-up and review mechanisms, the 2030 Agenda encourages member states to "conduct regular and inclusive reviews of progress at the national and sub-national levels, which are country-led and country-driven." These <b>voluntary national reviews (VNRs)</b> are expected to serve as a basis for the regular reviews by the UN High-level Political Forum on Sustainable Development (HLPF), meeting under the auspices of the United Nations Economic and Social Council (ECOSOC). Thirty-six countries presented VNRs to the HLPF in July 2024. <sup>25</sup> VNRs aim to facilitate the sharing of experiences, to strengthen policies and institutions of governments, and to mobilize multi-stakeholder support and partnerships for SDG implementation. To date, 177 countries have presented at least one VNR. <sup>26</sup>  |

## Country case studies

This document presents examples of how different countries have made use of national planning and reporting mechanisms, in the context of international processes, to guide investment and support toward climate-aligned agriculture and food systems innovation.

### Case study: Brazil

#### Agriculture and food systems in Brazil

As the world's fifth largest country and greatest net exporter of agricultural commodities, Brazil gains 20% of its GDP from the agri-business sector.<sup>27</sup> And, as the twelfth largest economy in the world, Brazil attracts USD 50 billion in international investment each year.<sup>28</sup> With significant vulnerability to climate change – different regions of the country are at risk from extreme temperatures, sea level rise, water scarcity, and heavy rainfall – Brazil was ranked 88 out of 187 countries in the 2022 ND-GAIN Index.<sup>29</sup> Home to one of the world's largest land 'carbon sinks,' Brazil is also the sixth greatest GHG emitter, in part due to agricultural expansion.<sup>30</sup> Land use change (52%) and agriculture (24%) are major sources of Brazil's GHG emissions and key sectors for mitigation.<sup>31</sup> Since 2000, agricultural productivity in Brazil has increased impressively and sectoral GHG emissions have grown more slowly given significant national sustainability initiatives such as promoting no-till farming and integrated crop-livestock-forest systems.<sup>32</sup> Stronger economic incentives and technical and financial support for low-emission production strategies, as well additional restraints on deforestation, would allow Brazilian agriculture to make further gains.<sup>33</sup>

#### Promoting innovation through national plans

In its most recent NDC submission, Brazil commits to a 37% reduction in GHG emissions from 2005 to 2025 as well as adaptation in essential sectors, including agriculture and livestock.<sup>34</sup> The NDC notes major national investment through the ABC Plan toward sustainable agriculture including "projects of nitrogen fixation, increased accumulation of organic matter (carbon) in the soil, no-till farming, the integration of forest, crops and cattle breeding, agroforestry and forest planting."<sup>35</sup> Brazil's National Adaptation Plan underscores the vital role of Embrapa, the Brazilian Agricultural Research Corporation, in actively contributing to the development of essential knowledge and technologies for sustainable production of food, fiber, and energy.<sup>36</sup> In its National Biodiversity Strategy and Action Plan, Brazil includes sustainable agriculture strategies, including enhancing the application of conservation-friendly agricultural practices and promoting the sustainable use of biodiversity in agricultural practices.<sup>37</sup>

### Case study: Vietnam

#### Agriculture and food systems in Vietnam

Vietnam's agriculture sector contributed USD 67 billion and the agri-food sector contributed USD 95 billion to the national GDP of USD 366 billion in 2021.<sup>38</sup> With a high economic growth

rate, this nation of 100 million people attracts significant public and private infrastructure investment.<sup>39</sup> Agricultural exports of rice, coffee, pepper, and other commodities generate over USD 50 billion annually.<sup>40</sup> Ranked 92 out of 187 in the 2022 ND-GAIN Index,<sup>41</sup> Vietnam is very vulnerable to climate change with projected agricultural losses above 5% by 2030.<sup>42</sup> The agriculture sector is threatened by increasingly erratic rainfall, rising temperatures, and extreme weather events.<sup>43</sup> Key areas for adaptation investment include resilient irrigation infrastructure and repurposing subsidies for water and fertilizer use toward producer support that facilitates adoption of improved practices and resilient crop varieties.<sup>44</sup> Generating about one-fifth of national GHG emissions, agriculture is Vietnam's second-largest source of GHGs.<sup>45</sup> Among other strategies, reducing agricultural expansion into forested areas is an important mitigation opportunity in Vietnam.<sup>46</sup>

### **Promoting innovation through national plans**

Vietnam's agriculture ministry has developed comprehensive plans for cutting total sectoral GHG emissions by 122 Mt CO<sub>2</sub>eq by 2030.<sup>47</sup> Toward the 2030 sustainable development agenda, Vietnam seeks to increase agricultural productivity and income of agricultural laborers by increasing investment in rural infrastructure and research and promotion services and by developing agricultural technologies and plant and animal genebanks.<sup>48</sup> Vietnam's NDC identifies key gaps in climate change adaptation, many of which are centered on finance, including high agricultural insurance costs and low access to financial services and green credit for vulnerable groups.<sup>49</sup> Among the adaptation strategies included in Vietnam's NDC, several relate to agricultural innovation including improved forecasting of precipitation and plant and animal diseases as well as redirecting public investment toward multi-purpose irrigation. Toward reduced sectoral GHG emissions – including a 30% reduction in methane emission over 2020 to 2030 – Vietnam's NDC emphasizes mitigation opportunities related to improved management of rice cultivation (e.g., alternating wet and dry irrigation), livestock (e.g., optimized ruminant rations), and organic fertilizers (e.g., composting of agricultural waste). Vietnam's NDC includes means of implementation related to the agriculture sector such as climate risk insurance for high-risk sectors including crop production and aquaculture and promoting technology transfer and innovation to develop climate-smart crop and livestock varieties. Emphasizing context-specific solutions, Vietnam's NDC also notes the importance of promoting regional cooperation, adaptive capacity within economic and social systems, and agricultural restructuring based on the natural advantages of specific production areas.

## **Case study: Kenya**

### **Agriculture and food systems in Kenya**

With agriculture as its economic cornerstone, climate change threatens growth and development in Kenya, which is a major financial, trade, and communications hub and the fourth largest economy in sub-Saharan Africa.<sup>50</sup> Kenya was ranked 145 out of 187 countries in the 2022 ND-GAIN Index.<sup>51</sup> Low productivity and heavy dependence on rainfall makes Kenya's agriculture and pastoral systems highly vulnerable to climate change.<sup>52</sup> In recent years, drought, high input costs, and land competition have dramatically reduced agricultural



productivity.<sup>53</sup> While Kenya generates less than 0.1% of global GHG emissions, national emissions have been rising with 40% resulting from agriculture and 38% resulting from forests, land use, and land use change.<sup>54</sup>

### **Promoting innovation through national plans**

As one of the first African countries to comprehensively develop legal and policy guidance for national and subnational climate action, Kenya's adaptation and mitigation priorities include climate-smart agriculture, landscape restoration, and other land sector activities.<sup>55</sup> As a flagship element of a ten-year transformation strategy, Kenya's agriculture ministry designated research, innovation, and data as essential to the development of diversified, demand-driven agricultural technologies, to boosting agricultural yields, and to evidence-based performance management.<sup>56</sup> In Kenya's 2022 NDC, a featured adaptation priority is mainstreaming climate-smart agriculture using a value chain approach focused on productivity gains. Emphasizing innovation, efficiency, and commercialization in crop, livestock, and fisheries production, the NDC indicates that sustainable land and resource management, enhanced agricultural extension, and insurance and other safety nets are key elements of building sectoral resilience. Improved risk management related to droughts, floods, and irrigation infrastructure as well as strengthened early warning and climate information services are also noted. Toward a low-carbon, climate-resilient development pathway, Kenya's NDC points to land degradation neutrality, nature-based solutions, and other approaches to reduce emissions in croplands and grasslands. The estimated cost of implementing mitigation and adaptation actions in Kenya's NDC is USD 62 billion.<sup>57</sup> The NDC commits to mobilizing domestic resources to cover 21% of the costs associated with achieving a 32% reduction in national GHG emissions by 2030 and, for the remaining costs, looks to international partners for finance, technology support, and capacity building.

## **Case study: Costa Rica**

### **Agriculture and food systems in Costa Rica**

Accounting for one-fifth of export earnings and employing 13% of the national workforce, Costa Rica's dynamic and diversified agriculture sector contributes 7% of national GDP.<sup>58</sup> Robust growth in the Costa Rican economy attracts substantial international investment.<sup>59</sup> Over the last fifty years, Costa Rica has shifted from grazing land covering nearly half of the country to a land use mix dominated by forests (51%), pastures (25%), and permanent crops such as coffee and fruit trees (6%).<sup>60</sup> Ranked 64 out of 187 countries in the 2022 ND-GAIN Index,<sup>61</sup> key climate change risks to Costa Rican agriculture include unpredictable patterns of seasonal rainfall, spread of pests and diseases, rising temperatures, and extreme weather events. Negative climate change effects on regional and global food supplies threatens Costa Rican food security given high its reliance on imports of staple foods.<sup>62</sup> The agriculture sector accounts for over one-third of national GHG emissions – with major contributions to sectoral emissions from livestock-generated methane (40%), nitrous oxide from fertilizers (54%), and irrigated rice (5%) – although this is offset in part (28%) by carbon sequestration in the land sector.<sup>63</sup>

## **Promoting innovation through national plans**

To achieve low-carbon agricultural production for local consumption and export, Costa Rica's NDC commits to consolidating an agricultural model based on efficiency and GHG emissions reduction and to embracing an innovative circular economy approach.<sup>64</sup> With emphasis on adoption of emission-reducing technologies and adaptive policies and practices, Costa Rica seeks to expand silvopastoral and agroforestry systems by 69,500 hectares, to increase the area of well-managed pasture by 1-2% per year, and to enhance soil organic carbon levels. Technical guidelines and certification standards are specified as a strategy for promoting integration of risk and climate adaptation in agricultural production. Costa Rica's NDC indicates that training programs will be created to connect women, youth, and other marginalized groups to green jobs in regenerative and precision agriculture. As one of ten axes in its National Decarbonization Plan, Costa Rica seeks to promote highly efficient agri-food systems that generate low-carbon export and local consumption goods, including a goal to develop innovative processes in the value chain of priority products.<sup>65</sup>

## **Case study: Indonesia**

### **Agriculture and food systems in Indonesia**

With a large landmass, abundant natural resources, centrality to major trade routes, and a population of nearly 300 million, Indonesia's USD 1.3 trillion GDP makes it the largest economy in Southeast Asia.<sup>66</sup> Ranked 97 out of 187 countries in the 2022 ND-GAIN Index, Indonesia faces significant risks from climate change.<sup>67</sup> Its agriculture sector is increasingly threatened by drought and fire and yields of key commodities are projected to drop due to rising temperatures and shifting rainfall patterns.<sup>68</sup> As an island nation with 180 million people living in coastal areas, sea level rise and weather-related disasters are a serious concern.<sup>69</sup> Indonesia is the world's tenth greatest GHG emitter, with 84% of GHGs arising from the land and energy sectors.<sup>70</sup> Over the last two decades, agricultural production serving domestic and international commodity markets has driven substantial carbon loss from land use change, degradation of carbon-rich peatlands, and fires.<sup>71</sup> Recent policy changes have helped to slow land cover change, driven primarily by agriculture and forestry, and have moderated the pattern of high GHG emissions from Indonesia's land sector, which accounts for more than two-fifths of national emissions.<sup>72</sup>

### **Promoting innovation through national plans**

In its most recent NDC, Indonesia indicates that agricultural productivity and land use planning are key to achieving its national 32% GHG emission reduction target.<sup>73</sup> Referencing the FOLU Net Sink 2030 target of 140 MtCO<sub>2</sub>, the NDC notes that policy and enforcement measures will focus on increasing carbon sequestration capacity of land systems and reducing emissions from deforestation, forest degradation, fires, and peat decomposition. In line with its climate goals, Indonesia issued a moratorium on permits to clear forests and created a peatland and mangrove restoration agency.<sup>74</sup> Arenas for agricultural innovation mentioned in Indonesia's NDC include improved seeds and cultural practices, integrated cropping calendars, soil and

water conservation technologies, land rehabilitation, organic fertilizers, crop protection, manure management for biogas, and cattle feed supplements. Financing schemes and enhanced community capacity for risk management and sustainable utilisation of natural resources are also noted. Research and innovation are among the priorities indicated in a 2023 omnibus regulation designed to reduce bureaucratic barriers to job creation.<sup>75</sup>

## **Case study: South Africa**

### **Agriculture and food systems in South Africa**

Although agriculture contributes only 2.6% of South Africa's GDP of over USD 400 billion,<sup>76</sup> investment and diversification in this sector – especially for small-scale, rainfed production – are key to rural poverty eradication and inclusive development.<sup>77</sup> Ranked 95 out of 187 countries in the 2022 ND-GAIN Index,<sup>78</sup> South Africa is experiencing more frequent heatwaves, longer dry spells, and greater rainfall intensity and temperatures are rising at more than twice the global rate of increase.<sup>79</sup> Risks to crops, trees, and livestock from climate change, and associated pest and disease pressure, are growing.<sup>80</sup> Accounting for 57% of water use, agriculture is threatened by increasing water scarcity, which could be mitigated through innovative water pricing or other demand management strategies.<sup>81</sup> Over the coming decades, investments on the order of 0.2% of GDP will be needed to implement adaptation measures in agriculture.<sup>82</sup> Representing 6% of national GHG emissions, agriculture, forestry, and land use also offer significant mitigation potential, for example, through revegetation and reductions in meat production and use of nitrogen fertilizers.<sup>83</sup>

### **Promoting innovation through national plans**

In its 2021 updated NDC, South Africa emphasizes climate-smart agriculture, capacity building, and development of early warning systems to assist small-scale agricultural producers.<sup>84</sup> The NDC notes that wildfires create uncertainties in estimation of GHG emissions from the land sector. Mitigation targets are described as ranges in annual national GHG emissions that decline over time. In its NDC, South Africa notes the importance of climate finance and other forms of international support to achieve a just climate transition. Emphasizing the need for robust research, innovation, and commercialization, South Africa's National Development Plan notes that investment in agricultural infrastructure has a key role in job creation and points to development finance in agriculture as a budget priority.<sup>85</sup>

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<sup>1</sup> [https://unfccc.int/files/adaptation/application/pdf/nap\\_overview.pdf](https://unfccc.int/files/adaptation/application/pdf/nap_overview.pdf)

<sup>2</sup> <https://unfccc.int/news/record-number-of-national-adaptation-plans-submitted-in-2023-but-more-are-needed>

<sup>3</sup> <https://unfccc.int/process/the-paris-agreement/long-term-strategies>

<sup>4</sup> <https://unfccc.int/lt-leds-synthesis-report#Finance-technology-development-and-transfer-capacity-building-and-international-cooperation>

<sup>5</sup> <https://unfccc.int/lt-leds-synthesis-report#Planning-and-implementation>

<sup>6</sup> <https://www.cbd.int/intro>

<sup>7</sup> <https://www.un.org/en/observances/biological-diversity-day/convention#:~:text=The%20Convention%20on%20Biological%20Diversity,been%20ratified%20by%20196%20nations.>

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