SMART BAROMETER

Edition 3 - 2025/202

Edition 3 - 2025/2026

ETTER NEWSL



COP30

WESTERN CAPE LAUNCHES WATER RESILIENCE STRATEGY

8

MINI SPRINT RESULTS
AND IMPACT
COMMUNICATION

12

MCAP -MEDITERRANEAN CLIMATE ACTION **17** 

THE SOUTH AFRICAN CLIMATE FINANCE LANDSCAPE 2025

22

KEY OUTCOMES OF COP30 IN BELÉM,

25

THE GEN-Z VINEYARD PROJECT **GROWS & TRANSFORMS INTO** ADVICO

# **CONTENTS**





### **EDITOR'S NOTE SMARTAGRI BAROMETER 3 - 2025/2026**

Welcome to the third edition of the SmartAgri Barometer of 2025/2026.

Once again, the festive season challenges us to slow down (unless you are a farmer!) and take a moment to reflect on what is important and dear to us, whether we are achieving the impact we desire, and what we can do better in the new year.

SmartAgri is first and foremost about the farmers and agri-workers who feed us every day and will continue to do this for generations to come despite the mounting challenges posed by climate and other pressures.

"Resilience" is the new buzz word. The agricultural sector of the Western Cape is certainly showing remarkable resilience - the world still wants to hear how the Day Zero Drought was defeated. But when will the next significant drought rear its ugly head? Are we ready? There are worrying early signs of dryness and extreme heat in parts of the province, and farmers are concerned.

The Western Cape Government launched its Water Resilience Strategy on 31 October. All role players must work together to implement this strategy, leveraging their collective knowledge, skills and resources "to future proof the Western Cape by ensuring water security and equitable access to water that meets the needs of all users".

This year has been the "year of global subnational partnerships" for the climate change teams of the Departments of Agriculture and of Environmental Affairs & Development Planning.

In May, we hosted the second annual convening of the Mediterranean Climate Action Partnership (MCAP), followed by the launch of three collaborative Mini-Sprint projects on drought, extreme heat and wildfire, and capped by our participation at COP30 in Brazil. We look forward to building on this momentum in 2026!

Enjoy the read, and please feel free to send your feedback and ideas, and to disseminate to other interested parties. We wish you all a relaxing festive season and prosperous 2026.

To access previous editions of the SmartAgri Barometer, please visit www.greenagri.org.za and click on SmartAgri.

**Prof Stephanie Midgley** Editor



# **WESTERN CAPE LAUNCHES WATER RESILIENCE STRATEGY**

On 31 October 2025, the Western Cape Government launched the "Western Cape Water Resilience Strategy: Future-Proofing our Water Security 2025-2035" at a function in Cape Town. "The Western Cape Water Resilience Strategy 2025-2035 is the product of over a decade of policy development, programmatic learning, and collaborative planning in response to growing climate-related water risks." (Chapter 1, WCWRS)

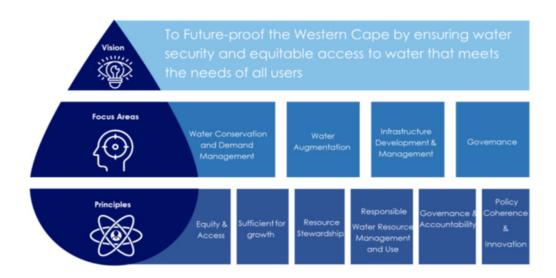
While the Western Cape Department of Local Government (DLG) took the lead in this work, it was supported by the provincial Departments of Environmental Affairs & Development Planning (DEA&DP) and Agriculture (DOA).

Minister Tertius Simmers (Department of Infrastructure) and Minister Ivan Meyer (Department of Agriculture, Economic Development and Tourism), as well as the Heads of Department of DLG (Mr Graham Paulse), DEA&DP (Mr Gerhard Gerber) and DOA (Dr Mogale Sebopetsa) provided the welcoming

and rationale for the new strategy, emphasizing the critical importance of long-term water security for the people, industries and environment of the Western Cape.

The National Department of Water and Sanitation has the overall responsibility for water resource management, and Ms Zanele Bila-Mupariwa, Regional Head of Department of Water and Sanitation, presented a national overview of water security and resilience. Water governance is complex, requiring multiple levels of collaboration for planning, monitoring and operational decision-making.

The Western Cape Water Resilience Strategy (WCWRS) was presented by Mr Msizi Nkuna (Deputy Director: Municipal Infrastructure, DLG). It aims to future proof the Western Cape by ensuring water security and equitable access to water that meets the needs of all users. This will be achieved through five principles and four focus areas, as shown in the diagram.



The WCWRS is part of the larger economic development planning and governance framework in the province that includes Growth4Jobs (G4J) and the Western Cape Infrastructure Framework, as well as the provincial Climate Change Response Strategy. As a large water user, the City of Cape Town is a key role player, with its own Water Strategy and New Water Programme, that evolved from lessons learned during the Day Zero Drought.

The impacts of climate change on water availability and water demand are recognised in the WCWRS, which points out that "Climate change is a central focus, with the strategy promoting both green and grey infrastructure that can withstand extreme weather events." Science indicates that the most likely future scenario is one of declining yield of water in the Western Cape Water Supply System. Planning has

included the possibility that yield could decrease by 20-30%, and that droughts will be more regular, more severe, and of longer duration. The loss of available water calls for strategic monitoring and planning for future augmentation, as well as increased emphasis on the responsible use of water.

To achieve the ambitious targets of the strategy, funding will be sourced through various mechanisms, including green and water bonds. Partnerships are key to implementation, leveraging expertise and resources to build a water-resilient Western Cape.

The WCWRS can be downloaded here: Western Cape Water Resilience Strategy 2025



Every year, the team from the Western Cape Department of Agriculture's (WCDoA) Disaster Risk Reduction (DRR) Sub-Programme (within the Programme Sustainable Resource Use and Management - SRUM) holds workshops with farmers in each of the five rural Districts. The purpose is to conduct a self-assessment of their specific disasters risks (hazards), for example droughts, fires, floods, pests and predators. This is followed by joint brainstorming by the farmers to identify and prioritise possible practical solutions that will better prepare them and build resilience in the longer term.

The focus is on the reduction of disaster impacts, as opposed to constantly responding to disasters, which is unsustainable. This has led to the inclusion of climate change as a discussion point (led by Prof Stephanie Midgley, WCDoA Research and Technology Development Services). Risks from climaterelated disasters are increasing and they are impacting severely on smallholder farming communities. Integration of climate change adaptation and disaster risk reduction policies and implementation is necessary to ensure the most effective use of resources over longer periods.

In the spirit of shared learning and coordinated action, the workshops are also attended by officials of the WCDoA Agricultural Producer Support and Development (extension services), Veterinary Services, Agricultural Economic Services and Rural Development, as well as other sub-programmes in SRUM (e.g. LandCare). Representatives of the Climate Change and Disaster Risk Reduction Directorate at the National Department of Agriculture, and of the Western Cape Provincial Disaster Management Centre, also regularly participate in the workshops.

On 4 December 2025, a workshop was held for the smallholder farmers of the area around Vredenburg, West Coast District Municipality. The participating farmers cultivate vegetables on small plots, relying on municipal water resources.

Vegetable farming is suited to the sandy soils and relatively mild climate of the area, provided that drainage is sufficient and crops are not exposed to extreme heat or wind.

Droughts in this region can be severe, but access to municipal water mitigates this hazard for vegetable farmers. However, livestock farmers do suffer during droughts when water and grazing for their animals is insufficient.

A specific local hazard identified by the farmers is looserunning dogs that damage vegetable plots. They also mentioned that moles are a big problem. The proximity to heavy industry near Saldanha Bay creates hazards relating to air quality.

Workshop participants agreed that the top priority for the farmers is sufficient access to, and affordability, of water for irrigation. Crop production under protection (to mitigate against strong sunlight and wind) was also highlighted. Several practical low-cost project suggestions were discussed. For example, second-hand shade netting from commercial fruit farms in the West Coast region could be made available to smallholder vegetable farmers, at minimal cost, and provide some job opportunities for installation. A co-benefit is the reuse of plastic waste which is also a climate-friendly practice.

From this information, the DRR unit will assess what interventions could be funded from the available sub-programme budget. It is believed that projects developed from these engagements will lead to more meaningful, supported and impactful outcomes that address both immediate disaster management needs, whilst also promoting medium-term risk reduction and on-farm resilience in a changing climate.

For more information, contact Leslie Marthinussen at Leslie. Marthinussen@westerncape.gov.za





The MCAP Mini Sprint Project Acceleration initiative spurs implementation and fosters collaboration across global Mediterranean bioregions by supporting innovative approaches to climate adaptation.

Last May, the partnership selected three promising proposals to receive funding and capacity support from the MCAP Secretariat to deliver on MCAP's Priority Actions— Extreme Heat, Wildfire, and Drought.

Since then, the project teams have advanced on their projects, generating new cross-regional collaborations and partnerships.

The Mini Sprints critically support MCAP and its members to build climate resilience, transforming climate policy priorities into practice through collaboration and network building, and raising global awareness of the shared fate of mediterranean regions. Our early insights indicate that MCAP offers a platform for climate action that both attracts new forms of finance to support local governments and enhances cooperation across multiple levels of government to advance climate adaptation.

# Some of our early findings indicate that:



MCAP Mini Sprints Foster An Enabling Environment For Climate Action: Its multiregion partnership model incentivizes governments to take action, attracting funders and philanthropy to drive crucial climate adaptation agendas forward.

The Mini Sprints Project Acceleration offers an agile model for subnational Mediterranean governments to act upon their most pressing climate challenges, unlocking critical funds to incentivize the cooperation and exchange needed to adapt to Extreme Heat, Wildfire, and Drought. MCAP unlocked \$150,000 in philanthropic funds from the Hilton Foundation to help advance three projects across six partner regions. Early assessments indicate this model is highly attractive to climate philanthropy, as the seed funds act as catalytic capital to de-risk innovation, forge essential public-private collaboration, and align policy priorities. This creates a proven, scalable framework that significantly lowers the barrier for attracting larger-scale government and private-sector climate finance.



MCAP Mini Sprints Advance Subnational Agendas for Bioregional Adaptation: It brings multiple sectors and levels of government together to test and scale climate innovations around the globe.

The Mini Sprints projects create a common ground for this action, providing a practical framework that meets regions where they are. They turn ambitious climate priorities into feasible implementation roadmaps by incentivizing unique, cross-sector collaborations. Early assessments indicate this model fosters otherwise limited cooperation among sectors of government, local organizations, and civil society, helping to align policy with on-the-ground action, streamline the testing of solutions, and draw in support from other levels of government. Project teams report that their projects have drawn the attention and interest from other levels of government, amplifying support, participation and buy-in.

# Quick-wins delivered so far are:



The Extreme Heat Mini Sprint positioned Metropolitan Santiago's Urban and Rural Heat Monitoring Platform as a delivery priority, gaining the endorsement and support from the Regional Extreme Heat Roundtable, which brings national ministries, public services, and the national Meteorological Directorate to prepare the region to Extreme Heat.

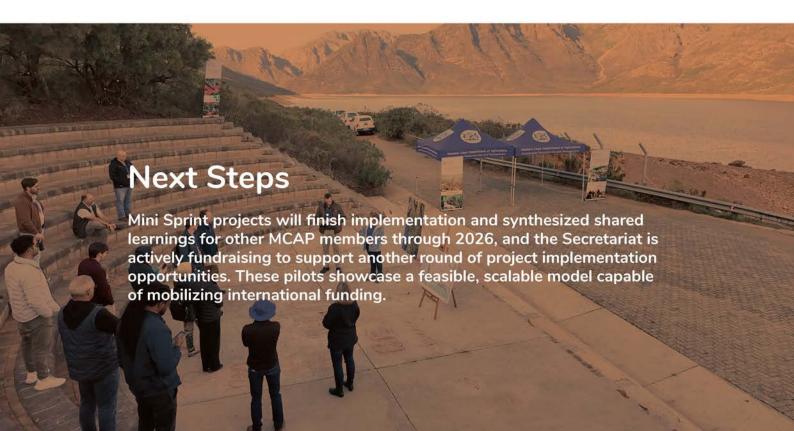


The Wildfire Mini Sprint team brought together 14 government agencies from the Western Cape, Catalonia, California, and Chile to co-design a unified wildfire information system applicable across Mediterranean regions. The project established a cross-regional working group that leverages regional expertise present in the most robust wildfire agencies around the world, extending resources and methodologies to the other regions.



The <u>Drought Mini Sprint</u> team has developed 120 artificial wetlands to be installed in the Hartenbos estuary in Western Cape with the goal to improve water quality and stream. Results will be available in the next cycle.

These findings demonstrate that the Mini Sprints are a primary driver of the MCAP 2024-26 Action Agenda. By facilitating technological and methodological exchanges across six partner regions, the Mini Sprints directly advance learning and foster the robust, practical network at the heart of MCAP's mission. They simultaneously accelerate action and policy while elevating awareness through pilot implementations.







# Improving Mediterranean Coastal Wetland Resilience Through Biodiversity Protection and Sustainable Water **Management Practices**

#### THE NEED

The combination of prolonged drought periods and sea level rise make Mediterranean regions highly vulnerable to reduced freshwater flows and increased saltwater intrusion. This salinization not only depletes freshwater supplies for consumption and agriculture but also severely impacts aquatic ecosystems and biodiversity. Under dire climate change scenarios, reduced freshwater flows pose an irreversible threat to wetlands' protective capacity against salinization, putting at risk the health and reliability of freshwater reservoirs. Preserving adequate freshwater flows and generating healthy wetlands are critical nature-based solutions that need to be prioritized in Mediterranean water management practices.

#### THE SOLUTION

This project will enhance the resilience of freshwater reservoirs by installing physical and nature-based barriers to reduce saline intrusion. In Catalonia, a sluice gate will be installed on the Fluvià River to physically limit saltwater intrusion from maritime storms and reduced freshwater flows, protecting local ecosystems and agricultural lands. Simultaneously, the Western Cape will construct a floating wetland to act as a natural filter in the Hartenbos estuary, absorbing excess water and managing salinization and erosion while improving overall ecosystem health. Both regions will monitor the performance of their interventions by tracing water loss and assessing infrastructure and riparian health.

Central Greece will act as a key knowledge partner, supporting implementation teams with best practices and research to prepare for a similar intervention in the future. Ultimately, the three regions will jointly develop a set of policy recommendations for long-term adaptive management of freshwater reservoirs under the increased threat of salinization.

#### **PARTNER REGIONS & ORGANIZATIONS**

**TEAM LEAD** 

Government of Catalonia

**PARTNER REGIONS** 

Western Cape Government Central Greece

្នុក្ខាំ្ implementation lead

Amics dels Aiguamolls i del Patrimoni Natural de l'Empordà (AAPNE)

**PROOF IMPLEMENTATION PARTNERS** Freshwater Research Center

#### **PROJECT TIMELINE**

2025 2026

#### **RESEARCH & ENGAGEMENT**

Identify the location of sluice gates and wetlands through desk research, site observations, stakeholder engagement.

#### COP30

Presentation of interim results.

#### **IMPLEMENTATION**

Implement technological solutions—hydraulic barriers in Catalonia and the Floating Wetland in Western Cape.











## Increasing Awareness and Preparedness to Extreme Heat in Mediterranean Regions Through a Heat Island Monitoring & **Prediction Tool**

#### THE NEED

Rising global temperatures are making Mediterranean climates increasingly vulnerable to extreme heat. This poses significant risks to human health, well-being, and economic stability, with vulnerable and extremely poor populations bearing the brunt of these impacts. While some regions, like California, have developed tools to map at-risk communities and provide resources, access to such solutions is uneven, particularly in the Global South. This leaves decision-makers, researchers, and communities disproportionately exposed and lacking the data needed to respond effectively. This project directly addresses this critical data gap in the Santiago Metropolitan Region, Chile, and the Western Cape, South Africa, two regions each home to over 7 million people that experience severe heat.

#### THE SOLUTION

This project will create a Heat Island Monitoring & Prediction Tool, a GIS-based web tool to map heat islands within the urban and rural areas of Santiago de Chile and the Western Cape regions. Building on a successful model from California, this tool will help regional and local governments, scientists, and planners understand heat exposure and inform adaptive strategies. Working with local university partners in Santiago and Western Cape, the project will deploy sensors to collect standardized temperature data across both regions. By integrating temperature data with census and health data, the tool will identify areas most at risk. This will enable stakeholders to make better-informed decisions on resource allocation and the development of adaptation strategies to keep communities safe, strengthening technical capacity and fostering data-driven decision-making to close the climate resilience gap.

#### **PARTNER REGIONS & ORGANIZATIONS**

#### **TEAM LEAD**

Regional Government of Santiago, Chile (GORE)

#### **PARTNER REGIONS**

Western Cape Government California



#### **PROJECT ADVISOR**

Office of Environmental Health Hazard Assessment, California Environmental Protection Agency



#### IMPLEMENTATION PARTNERS

School of Public health, University of the Western Cape (UWC), Universidad de Chile, Red por la equidad energética (REDPE) and Universidad Andrés Bello.

#### **PROJECT TIMELINE**

2025 2026

#### **BASELINE ASSESSMENT**

Create a baseline assessment of current urban health vulnerability and adaptation strategies identifying key resources and critical hotspots in Santiago and Western Cape.

#### COP30

Present progress on tool development. Gather inputs and feedback from other sampling campaign.

#### **DATA GATHERING &** TOOL DEVELOPMENT

Gather temperature data during the summer. Develop the heat island monitoring and prediction tool to be regions. Start the heat released by the end of year.





















# Informing Mediterranean Managed Fire Practices Through a Geospatial Risk & Biodiversity Assessment Platform

#### THE NEED

While wildfires are a natural part of many Mediterranean ecosystems, increasing human populations and climate change are intensifying their severity, putting people and the environment at greater risk. In regions like Catalonia and the Western Cape, this is compounded by factors such as the decline of open habitats, the spread of invasive species, and the growth of homogenous forest landscapes. Insufficient and scattered data on these threats prevent authorities and communities from taking deliberate, coordinated action, even when managed fire practices could offer a solution.

#### THE SOLUTION

This project will create a comprehensive, map-based tool that integrates biodiversity and historical wildfire data from Catalonia and the Western Cape. Building on Catalonia's existing methodology, the tool will identify high-priority areas for proactive, managed fire practices to reduce fuel loads from invasive species, helping to restore biodiversity and preserve water. A broader team of wildfire and biodiversity experts from California, New South Wales, and Santiago, Chile will collaborate to enhance this methodology and develop a system for predictive risk modeling and mitigation planning. The project will leverage remote-sensed imagery and other sources to establish indicators for evaluating the efficiency of these fire prevention actions. This comprehensive system will be designed to provide critical biodiversity and risk information for governance and a continuous service for a wide range of public and private users, enabling them to integrate managed fire practices in their mitigation actions.

#### **PARTNER REGIONS & ORGANIZATIONS**

**TEAM LEAD** 

Western Cape Government

#### **PARTNER REGIONS**

Government of Catalonia The California Department of Forestry and Fire Protection (CALFIRE);

Department of Climate Change, Energy, the Environment and Water, Government of New South Wales;

Department of Environment. Metropolitan Government of Santiago, Chile

# ្តក្តុំ implementation lead

CapeNature, Western Cape Department of Agriculture, Council for Scientific and Industrial Research

#### **PARTNERS**

Center for Ecological Research and Forestry Applications (CREAF)

#### **PROJECT TIMELINE**

2025 2026

#### **RESEARCH & ENGAGEMENT**

Conduct research and collaborative workshops to gather, organize, and analyze all necessary wildfire information from the different region.

#### COP30

Develop designs for two pilot wildfire risk management maps and dashboards.

#### PROOF OF CONCEPT & **FUNDRAISING**

Present the proof of concept to prospective funders and implementing partners.







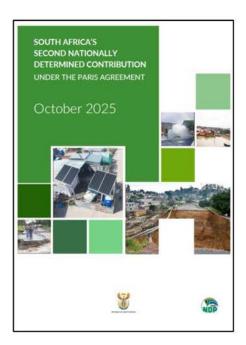








# South Africa submits its Second Nationally **Determined Contribution under the Paris Agreement**



In October 2025, the Department of Forestry, Fisheries and the Environment (DFFE) submitted South Africa's Second Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC). The timing was aligned with the 30th Conference of the Parties to the UNFCCC (COP30) which took place in Belém, Brazil, from 10 to 22 November 2025.

Under the UNFCCC Paris Agreement, countries must update their NDCs every five years. They present how every country intends to reduce their emissions of greenhouse gases (GHGs), and how they intend to adapt to climate change. Collectively, all countries' commitments should be sufficient to limit warming to well below 2°C, ideally below 1.5°C, above pre-industrial levels.

South Africa submitted its first NDC in 2015, and an updated first NDC in 2021. The second NDC sets out proposed climate commitments for the period 2031–2035. The document reflects the evolving national climate policy and legislation (the Climate Change Act No. 22 of 2024) and a stronger focus on equity and resilience according to the country's Just Transition Framework.

The economy-wide revised GHG emissions targets reflect South Africa's highest possible ambition, considering equity and national circumstances. The second NDC supports a just transition to net zero CO<sub>2</sub> emissions by 2050.

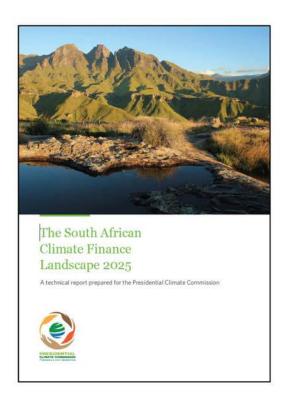
A strengthened focus on adaptation and resilience is linked to more gender mainstreaming and youth empowerment, drawing on the nation's National Climate Change Adaptation Strategy of 2020. A Just Adaptation and Resilience Investment Plan is being developed to mobilise international finance. The country aims to achieve climate finance of US\$ 8 billion per year by 2030.

South Africa's Second NDC can be downloaded here:

https://unfccc.int/sites/default/files/2025-

10/South%20Africa%27s%20second%20Nationally%20Determined%20Contribution 2025.pdf

## The South African Climate Finance Landscape 2025



The following excerpts are taken from the report. Readers are encouraged to read the full report which can be downloaded here:

https://www.climatecommission.org.za/publications/the-south-african-climate-finance-landscape-2025

#### **About this Report**

The South African Climate Finance Landscape 2025 report provides empirical evidence on climate finance investment flows directed toward low-carbon and climate-resilient interventions in South Africa, along with additional market intelligence on the South African policy landscape and investment opportunities and barriers in the end-use sector. Building on the previous edition published in 2023, this report maps project-level investments spanning the calendar years 2022 and 2023, identifying financial sources and intermediaries; instruments used; uses of climate finance; and sectors receiving climate-related funding. Through the periodic tracking of climate finance investments and needs in South Africa, the report aims to identify gaps and potential opportunities to facilitate the scaling up of climate finance in South Africa.

#### **Executive Summary**

Regulatory, policy, and financial shifts are reshaping South Africa's climate transition, marking a decisive move from commitment to implementation. The country's climate policy framework now closely aligns with national development priorities, reflecting two decades of progress in integrating climate considerations into economic and social planning. Internationally, South Africa has deepened its leadership in climate diplomacy. As G20 President in 2025, it continues to engage actively through the UNFCCC, BRICS, and the African Union to advocate for the

priorities of developing economies. The country is also leveraging its Just Energy Transition Partnership (JETP) to mobilise concessional and blended finance, while championing multilateral development bank reform and debt-relief mechanisms to expand fiscal space for climate action, and contributing to global dialogue on the evolution of country platforms.

As South Africa advances its climate transition, tracking how resources are mobilised and deployed is critical not only to strengthen domestic and international decisions, but also to guide development finance institutions (DFIs) strategies, and inspire and inform other countries. The South Africa Climate Finance Landscape 2025 supports this effort by examining how climate finance was mobilised in 2022 and 2023, tracking flows for climate mitigation and adaptation solutions, as well as those with dual benefits across both mitigation and adaptation. This study tracks finance from both domestic and international sources, at both private and public levels, and indicates the instruments used to disperse those funds, ultimately identifying the sectors that benefited. This is the third iteration of the South African Climate Finance Landscape, following publications in 2021 and 2023.

This study is based on publicly available and proprietary data, sourced on a best-effort basis, to provide a comprehensive mapping of South Africa's climate finance landscape. Methodological and data limitations remain, particularly on the periodic availability, quality, and robustness of information on private and public investment. To help address these gaps, this report uses CPI's robust climate finance accounting methodology and adapts it to the South African context, complemented by insights from extensive interviews with market experts and stakeholders within the climate finance ecosystem. Notable improvements in this 2025 edition includes:

- Alignment of sectoral classifications with the South African Green Finance Taxonomy (SA GFT), published in 2022.
- Four new datasets and 16 additional domestic private and public-sector stakeholders, adding an annual average of ZAR 32 billion.
- Tracking just transition aligned climate investment.

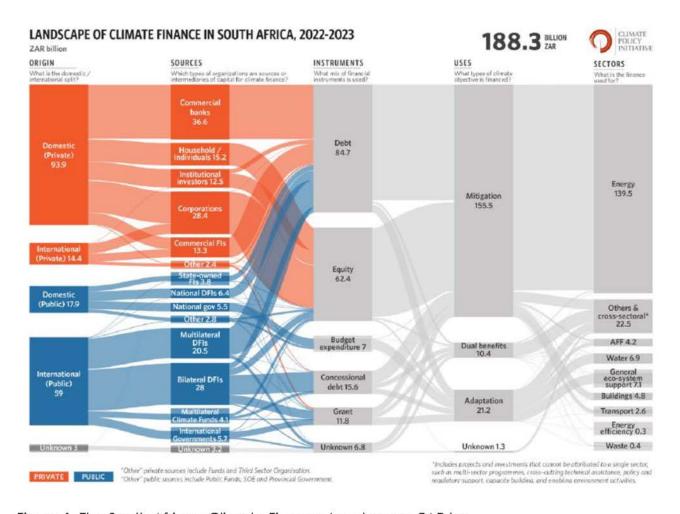


Figure 1. The South African Climate Finance Landscape, ZAR bn.

#### Key Findings (elaborated in the report):

- Energy dominates climate investment, with an annual average of ZAR 139.5 billion (74.1%) going into the sector, particularly for renewable electricity generation.
- Adaptation finance is lagging.
- South Africa's climate finance mix reflects its middle-income country status.
- Nearly 60% of total climate finance flows originated from domestic sources.
- Public sources dominate South Africa's international climate finance flows.
- South Africa's just transition is emerging but modest.
- Cross-cutting challenges continue to constrain outcomes.
- The South African Climate Finance Landscape 2025, tracking years 2022–2023, highlights both significant progress and persistent gaps compared to previous tracking periods.

priorities of developing economies. The country is also leveraging its Just Energy Transition Partnership (JETP) to mobilise concessional and blended finance, while championing multilateral development bank reform and debt-relief mechanisms to expand fiscal space for climate action, and contributing to global dialogue on the evolution of country platforms.

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# KEY OUTCOMES OF COP30 IN BELÉM, BRAZIL

By Dr Stephanie Midgley

For the first time, officials of the Western Cape Department of Agriculture (WC-DOA) participated in a "Climate COP".

Ms Ashia Petersen (Director: Sustainable Resource Use and Management) and Dr Stephanie Midgley (Specialist Scientist Climate Change) represented the Western Cape Government (WCG) Climate Change leadership group at COP30 held in Belém, Brazil, on 10-22 November 2025.

Their participation in conference events, learnings and recommendations will be included in the next Barometer (March 2026). In this article, key outcomes of COP30 in the context of South African and Western Cape climate response priorities, especially regarding agriculture and food systems, are briefly summarized.





#### A DIFFERENT COP

The 2025 Belém Climate Change Conference took place against a backdrop of rising geopolitical tensions, record-breaking temperatures globally, and logistical and climatic challenges associated with hosting this mega-event in the Amazon.

This was the 30th Conference of the Parties (COP30) of the signatories to the United Nations Framework Convention on Climate Change (UNFCCC), one of the three "Rio Conventions" from the 1992 Earth Summit held in Rio de Janeiro. It was also the 10th anniversary of the Paris Agreement (2015) under the UNFCCC.

COP30 was ambitiously termed the "COP of Truth" and the "COP of Implementation" by the Brazilian hosts. Civil society could, for the first time in four years, give greater expression to their concerns and needs inside and outside the venue, leading to some tense moments. But this reflected a growing incorporation of, and cooperation with, local and indigenous communities and other actors at ground (implementation) level.

The formal outcomes of the negotiations did not adequately capture this, and much more effort is required to channel climate finance and other support to where it is most needed so that progress on mitigation and adaptation action is accelerated.

#### THE "GLOBAL MUTIRÃO"

Ahead of the opening plenary, the Brazilian COP30 presidency announced that it would hold consultations on four items some negotiating blocs had sought to add to the agenda. These included developing country climate finance, unilateral trade measures, the ambition gap (measures to keep global warming to under 1.5 $\square$ C) and data transparency (regarding emissions reporting).

A key outcome of COP30 was an agreed "global mutirão" package that shows the way forward on these four controversial issues. "Mutirão" is a Portuguese word originating in the Indigenous Tupi-Guarani language that refers to people working together towards a common aim with a community spirit.

A widely decried result was that the document contains **no road maps** on transitioning away from fossil fuels, or reversing deforestation, which were strongly supported by many countries, but equally strongly opposed by others. Instead, the COP30 presidency promised to lead a process to bring forward these roadmaps, with a view to presenting progress at COP31 in November 2026. The fossil-fuel roadmap will be guided by a conference to be hosted by Colombia and the Netherlands in April 2026.

On **climate finance**, the "mutirão" package launched a new work programme for countries to discuss concerns about climate finance, as well as a new goal to triple adaptation finance (see section on adaptation). The text re-emphasises the importance of **keeping the 1.5°C temperature goal within reach**, with limited overshoot to reduce the impacts. The UNFCCC released an NDC (Nationally Determined Contributions under the Paris Agreement) synthesis report shortly before COP30 based on 100 NDCs received, with an update that included 22 newly submitted NDCs.

The latter found that implementation of these NDCs will cause global emissions to drop 12% by 2035 from 2019 levels, "bending the emissions curve downwards for the first time", but falling drastically short of the 60% cut needed to keep 1.5°C in sight. Nevertheless, in 2015 we were tracking a scenario where warming would reach 4-5°C by the end of the century. Thanks to global efforts since then (especially on clean energy), the world is now tracking a scenario of 2.8°C warming. If all the countries' NDCs are implemented, the warming will be around 2.3-2.5°.

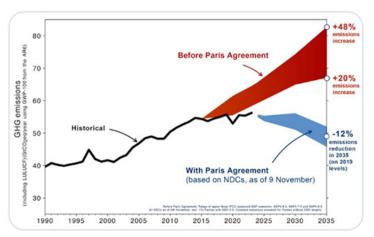


Figure 1. The emissions curve is being bent downwards. Global emissions are projected to fall by 12% in 2035 (compared to 2019 levels) based on new NDCs. Source: Simon Stiell (UNFCCC).

**Unilateral trade measures (UTMs)** did not make it into the negotiations agenda, but this controversial issue was taken up as part of presidency-led discussions and reflected in the "mutirão" - the first time global trade is included in a COP cover decision.

UTMs are actions by one state affecting international trade without agreement from other countries. They can include tariffs or taxes, in this context to advance climate goals, diverging from multilateral World Trade Organization (WTO) rules.

An example is the carbon border adjustment mechanism (CBAM) imposed by the European Union on high-carbon imports (e.g. steel, fertilizer). The EU's purpose is to make progress on reducing greenhouse gas emissions and prevent the "leakage" of high emissions; their own producers are held to high environmental and emissions standards. Exporting countries assert that this is unfair because it makes their goods more expensive and stifles trade. The decision was made to hold dialogues on trade at the annual Bonn intersessional meetings in 2026-2028. These talks will involve governments and other actors like the WTO.

#### JUST TRANSITION WORK PROGRAMME

Negotiations led to agreement on establishing a Just Transition institutional mechanism, the Just Transition Work Programme (JTWP). This was welcomed and hailed as a victory by civil society organizations.

The text contains strong language centered on human rights (including labour rights and the right to a healthy environment) and creates a mechanism for bringing to the fore the issue of social justice. It also refers to the "meaningful participation" of a range of marginalized groups, including, for the first time in a COP decision, people of African descent. The decision also recognizes the role of smallholder farmers and food production.

#### **ADAPTATION**

Adaptation played a central role at COP30, with two notable outcomes.

Firstly, the "mutirão" calls for a tripling of adaptation finance by 2035. The increased provision of adaptation finance is critical to many developing countries that are suffering from climatic changes and extreme weather. This can go towards early warning systems, disaster risk reduction measures, and long-term investments in water systems and climate-resilient agriculture.

Not all countries were happy - there is no clear baseline year, the target date of 2035 is seen to be too late (it should be 2030), and the quality of the finance is not clear (it should not add to developing countries' already high debt burden). The \$120bn per year promised by 2035 must also be compared with the \$360bn projected need.

Secondly, one of the major negotiated outcomes at COP30 was the agreement on the Global Goals on Adaptation (GGA). Countries adopted a list of 59 indicators to be used to measure progress towards the GGA. These include five indicators on assessing progress towards climate-resilient and sustainable food systems.

#### **BELÉM GENDER ACTION PLAN**

Another important negotiated agreement was the new Gender Action Plan (GAP) under the Paris Agreement, which addresses the specific climate vulnerabilities of women. The GAP sets out five priority areas for action:

- Capacity-building, knowledge management and communication.
- Gender balance, participation and women's leadership.
- Coherence across different workstreams, processes and other UN conventions.
- [Gender-responsive] implementation and means of implementation.
- Monitoring and reporting.

#### AGRICULTURE AND FOOD SECURITY

On this important topic, there was both disappointment and cause for optimism.

The final "mutirão" text mentioned the synergies between climate change, biodiversity loss, land rights and deforestation, and emphasizes the importance of "conserving, protecting and restoring nature and ecosystems". But no mention is made of food or agriculture, to the consternation of many.

Nevertheless, COP30 delivered many launches, discussions and financing initiatives for food systems and agriculture outside of the negotiation rooms. These spanned everything from smarter and more sustainable production, new technologies and better supply chains to policy shifts, new finance models, and responsible consumption. There was tangible energy and purpose amongst the role players to make faster progress towards implementing known solutions at scale.

#### SHARM EL-SHEIKH JOINT WORK

Formal negotiations under the Sharm el-Sheikh joint work on the implementation of climate action on agriculture and food security (SJWA), the main process for climate action on agriculture and food security, ended without agreement. The COP30 Presidency announced that this critical workstream will be given more time for discussion.

The SJWA runs workshops, is developing an online portal and preparing an annual synthesis report of agriculturerelevant work undertaken by UNFCCC bodies. At COP30, parties discussed the outcomes of a workshop on "systemic and holistic approaches" to implementing climate action on food and agriculture.

A highly divergent set of views on what constitutes "holistic approaches" ranged from agroecology to Al-driven farming, precision agriculture and carbon markets to reward farmers. Talks will resume in June 2026.

#### **RAIZ**

RAIZ (Resilient Agriculture Investment for net Zero land degradation) was launched at COP30, backed by ten countries. It aims to bring together governments and investors to restore degraded farmland globally, unlocking private capital, boosting food security, and cutting emissions. A global dashboard will help countries map degraded land and attract investment.

#### BELÉM DECLARATION ON HUNGER, POVERTY AND **HUMAN-CENTERED CLIMATE ACTION**

The Belém declaration on hunger, poverty and humancentered climate action was launched during the world leaders' summit preceding the start of negotiations. It was adopted by 43 countries and the EU. It aims to address the "unequal distribution of climate impacts" through actions including expanding social-protection systems, and supporting climate adaptation for small farmers.

#### **GLOBAL FOOD-WASTE INITIATIVE**

The United Nations Environment Programme (UNEP) launched its Global Food-Waste Initiative, backed by Brazil, Japan, the UK and several cities and companies across supply chains. It aims to halve food waste by 2030, potentially cutting methane emissions by up to 7%. It includes goals for governments to integrate food waste into climate and biodiversity plans.

#### **BELÉM DECLARATION ON FERTILIZERS**

Brazil and the UK launched the world's first global standard for low-emission fertilizers. The declaration also calls for support for clean ammonia, new production hubs, and digital nutrient tools, targeting one of agriculture's fastest-growing emission sources.

#### ALLIANCE OF CHAMPIONS FOR FOOD SYSTEMS **TRANSFORMATION**

The Alliance of Champions for Food Systems Transformation welcomed three new country members at COP30: Colombia, Italy, and Vietnam. This coalition, launched at COP28, also published its progress report.

#### Reports on how food systems were included in NDCs

Several reports were released that analysed how agriculture and food systems were included in the updated set of NDCs (countries' official climate plans). 93% of current NDCs include at least one measure around agriculture or food systems, up from 86%.

#### Private funding pledges

- During the Agricultural Innovation Showcase, several countries pledged over \$142m to the Consortium of International Agricultural Research Centers (CGIAR) for climate-smart agricultural innovation.
- The Gates Foundation pledged \$1.4bn for smallholder farmer climate adaptation in sub-Saharan Africa and south Asia.
- The Rockefeller Foundation pledged more than \$5.4m to strengthen the resilience of food systems and provide children's school meals.

#### Stronger role for local action: communities, cities and subnational regions

This was a major theme across COP30. In the next edition of the SmartAgri Barometer we will discuss this in more detail, alongside an account of the Western Cape's participation in panel discussions aligned with this theme.







# THE GEN-Z VINEYARD PROJECT GROWS AND TRANSFORMS INTO ADVICO

Supplied by Vinpro



The ADVICO (Advancement of Viticulture Collective) platform marks the next chapter in journey of GEN-Z Vineyard Project, launched by Vinpro in 2016. What started as a focused initiative to establish demonstration blocks comparing cultivars, clones, and rootstocks has grown into a dynamic, collaborative effort that connects research, practice, and people across South Africa's wine industry. The GEN-Z Vineyard Project was established to create a space where winegrowers could learn through observation and shared experience. By developing interplanting demonstration sites in commercial vineyards, growers can see firsthand how different combinations perform under real-world conditions. These demonstrations remain invaluable learning grounds, bringing science out of the lab and into the vineyard, where theory meets practice and practical insights are carefully and collaboratively developed.

As the project has matured, its vision has broadened. The focus, no longer solely on the "next generation" of vineyard plantings but on advancing viticulture as a whole through applied research, collaboration, and continuous learning. This shift in purpose called for a new identity, one that captured the broader mission and the collaborative spirit that had defined the project's success. The name ADVICO, derived from the Advancement of Viticulture Collective, embodies that vision. It reflects a renewed commitment to drive progress through partnerships, to link growers and researchers, and to bridge the gap between research and practical vineyard application. ADVICO represents not a new beginning, but a natural continuation of the GEN-Z legacy—stronger, more connected, and future-focused.

Today, ADVICO's work spans several interconnected areas. The interplanting demonstration network remains the foundation, offering comparative insights into the performance of cultivars, clones, and rootstocks across diverse growing environments. Alongside these sites, applied research projects address real-world viticulture challenges developing solutions that are both scientifically sound and practically relevant. ADVICO also partners with tertiary institutions to support student learning and cultivate the next generation of viticulturists, ensuring that the industry continues to attract and nurture fresh talent. Knowledge sharing is another cornerstone of the platform. Through vineyard walks, demonstration days, workshops, and digital learning resources, ADVICO makes research findings accessible, actionable, and relevant to growers on the ground. In an industry facing the pressures of climate change, limited natural resources, and rising input costs, collaboration has never been more important.

ADVICO helps the South African wine industry respond to these challenges through collective learning and shared innovation. By connecting growers, researchers, and industry partners, the platform encourages open exchange, turning data into understanding and experience into progress.

Looking ahead, ADVICO continues to expand with new demonstration sites, research initiatives, and partnerships. Its goal remains clear: to advance viticulture through collaboration, ensuring that the insights gained in the vineyard benefit not just individual farms but the broader wine community. ADVICO is more than a platform, it is a movement towards smarter, more sustainable, and more connected wine grape growing in South Africa. For further information please contact Emma Carkeek, Manager: Knowledge & Technology Transfer, Vinpro, at emma@vinpro.co.za



Siyabonga Mhlungu (Vinpro intern), Logan Jooste (ADVICO viticulturist), Emma Carkeek (ADVICO & Knowledge Transfer Manager, Vinpro) and Elzanne Bosman (ADVICO viticulturist) at the launch of the new ADVICO platform on October 29th at Rupert & Rothschild in Simmondium.



The ADVICO team harvesting and collecting samples for the evaluation of different Cabernet Sauvignon clones at an interplanting demo site at Stellenzicht in Stellenbosch.



# SHOWCASING RESEARCH

In this edition of the Barometer, we share a set of recently published scientific articles from around the world that advance our understanding of agricultural emissions footprints, factors that enhance the land carbon sink, the benefits and costs of increasing soil organic matter, the impact of climate change on major crops in the last 50 years, factors influencing sustainable agriculture practices adoption by farmers, and an assessment of the "safe operating space" of food systems. We encourage our readers to explore these articles. Please feel free to share your comments and what we can learn for agriculture in the Western Cape as we navigate the changes occurring due to climate change.

C. A. Adlan, S. V. Hanssen, H. Luchtenbelt, C. Hendriks, J. C. Doelman, E. Stehfest, B. Wicke, 2025. Emissions Footprints of Agriculture Around the World 1970-2020: Decreasing Land Conversion, Regional Exceptions and Increasing Management Intensity. Global Change Biology, 2025; 31:e70528. https://doi.org/10.1111/ gcb.70528

#### **ABSTRACT**

Land-use change (LUC) and agricultural management associated with crop production are responsible for 13% of global anthropogenic greenhouse gas emissions. However, the quantification of such land use emissions for specific crops remains incomplete due to the exclusion of important emission sources and limited geographic or crop coverage in previous studies. In this paper, we derive global spatially explicit land use emissions from LUC and agricultural management over the period of 1970 to 2020 and attribute them to 16 agricultural crop types and pastureland for livestock production, using the IMAGE-Land and LPJmL 4.0 models. Our results show 210 GtCO2-eq were emitted over these 50 years; 69% of which were from LUC and 31% from agricultural management. To analyze trade-offs between emissions and productivity, we generate emissions footprints (tCO2-eq/ha) and emission intensities (tCO2-eq/ton) per crop. Here, we define three clusters of crop-region pairings that help prioritize measures for future reduction in land use emissions from agricultural crops: (i) high-footprint, efficient land use (e.g., palm oil in Indonesia) where limiting conversion of high-carbon stock area has first priority, (ii) low-emission, inefficient land use (e.g., tropical cereals in Western Africa) where the focus should be on improved agricultural management to increase yields and thereby also minimize the need for land expansion, and (iii) moderate-footprint and moderately efficient land use (e.g., soybeans in Brazil and rice in Southeast Asia) where a combination of agricultural management improvements and restricting land conversion can help most.

Trevor W. Cambron, Joshua B. Fisher, Bruce A. Hungate, Benjamin D. Stocker, Trevor Keenan, Iain Colin Prentice & César Terrer, 2025. Plant nutrient acquisition under elevated CO<sub>2</sub> and implications for the land carbon sink. Nature Climate Change. <a href="https://doi.org/10.1038/s41558-025-02386-y">https://doi.org/10.1038/s41558-025-02386-y</a>

#### ABSTRACT

Terrestrial ecosystems currently sequester around one-third of the anthropogenic carbon emitted each year, slowing the pace of climate change. However, the future of this sink under rising atmospheric CO. concentrations remains uncertain, in part due to the impact that nutrient limitation may have on plant biomass. Here we review plant nutrient acquisition strategies and evidence of the enhanced utilization of these strategies under experimental and real-world elevated CO2. Many of the strategies that are key to alleviating nutrient limitation under elevated CO2 are not well represented in current Earth system models, and a simple data-driven analysis implies that models that do not account for nutrient acquisition strategies could underestimate the land sink.

Chelsea Janke, John Kirkegaard, James Hunt, Louise Barton, Lindsay Bell, Senani Karunaratne, Lynne M. Macdonald, Chiara Pasut, Uta Stockmann, Ehsan Tavakkoli, Gupta Vadakattu, Anton Wasson and Mark Farrell, 2025. The pros and cons of increasing soil organic matter in dryland cropping systems. Crop & Pasture Science 76, CP24257. https://doi.org/10.1071/CP24257

#### **ABSTRACT**

Soil organic matter (SOM) in drylands accounts for approximately 33% of global soil organic carbon (SOC) stocks and regulates many processes. Anthropogenic activities and climatic changes have influenced, and continue to significantly influence SOM contents. However, management practices that improve the soil carbon (C) and macronutrient balance can increase or maintain SOM. These include (1) maximising C inputs from grain crops, (2) integrating livestock and pasture phases, (3) using cover crops, (4) intercropping, (5) managing tillage and stubble, and (6) organic amendments. Estimated SOC increases achievable in drylands, ranging from 60 to 114 kg C ha year-1, fall short of the ambitious '4 per mille' target, which is equivalent to a 0.4% annual increase in initial soil C, or at least 240 kg C ha-1 year for drylands (assuming a global mean dryland SOC stock of 60 Mg C ha-1). In dryland systems, we propose a more rational approach, advocating for context-specific optima with a clear understanding of the benefits and costs to evaluate the suitability of management practices for improving SOM. The benefits include amelioration of soil constraints, improving nutrient and water availability, enhancing system resilience and sustainability, and potential participation in C markets. However, costs can be significant and are typically divided into the following two main categories: (1) economic (e.g. financial costs required for implementing management practices), and (2) environmental (e.g. the potential for increased nutrient loss via emissions or leaching as a result of enhanced nutrient cycling). The net benefit or cost is highly context-dependent, with the unique challenges of dryland environments being often overlooked in the literature. This review examines the primary strategies for maintaining or increasing SOM in dryland arable systems, the associated benefits and costs, methods for monitoring SOC stocks, and future challenges and opportunities.

David B. Lobell and Stefania Di Tommaso, 2025. **A half-century of climate change in major agricultural regions: Trends, impacts, and surprises**. *PNAS* 2025 Vol. 122 No. 20, e2502789122. <a href="https://doi.org/10.1073/pnas.2502789122">https://doi.org/10.1073/pnas.2502789122</a>

#### **ABSTRACT**

Efforts to anticipate and adapt to future climate can benefit from historical experiences. We examine agroclimatic conditions over the past 50 y for five major crops around the world. Most regions experienced rapid warming relative to interannual variability, with 45% of summer and 32% of winter crop area warming by more than two SD (a). Vapor pressure deficit (VPD), a key driver of plant water stress, also increased in most temperate regions but not in the tropics. Precipitation trends, while important in some locations, were generally below 1σ. Historical climate model simulations show that observed changes in crops' climate would have been well predicted by models run with historical forcings, with two main surprises: i) models substantially overestimate the amount of warming and drying experienced by summer crops in North America, and ii) models underestimate the increase in VPD in most temperate cropping regions. Linking agroclimatic data to crop productivity, we estimate that climate trends have caused current global yields of wheat, maize, and barley to be 10, 4, and 13% lower than they would have otherwise been. These losses likely exceeded the benefits of CO2 increases over the same period, whereas CO2 benefits likely exceeded climate-related losses for soybean and rice. Aggregate global yield losses are very similar to what models would have predicted, with the two biases above largely offsetting each other. Climate model biases in reproducing VPD trends may partially explain the ineffectiveness of some adaptations predicted by modeling studies, such as farmer shifts to longer maturing varieties.

Michael Madin, Katherine Nelson, Matthew Sanderson & Laura Moley, 2025. A synthesis of factors influencing sustainable agriculture practices adoption among rural farmers: A scoping review. Journal of Rural Studies 120, 103853. https://doi.org/10.1016/j.jrurstud.2025.103853

#### **ABSTRACT**

Rural regions are significant food producers, yet there are concerns about adoption of sustainable agriculture practices among rural farmers. Empirical studies show that a wide range of factors influence adoption of sustainable practices. We reviewed 83 studies on this subject to analyze which climatic, economic, sociocultural, and environmental factors significantly influence adoption of sustainable practices. Our analysis found that most of the selected studies (82 %) considered socio-cultural and economic characteristics of farmers but neglected climatic and environmental factors. The influence of these factors on farmers' adoption likelihood varied by type of sustainable practice and study context. The results indicated that drought events, rising temperatures, higher income and wealth, perceived environmental benefits, presence of disease, poor soil fertility, higher education, access to extension services, strong social networks, and positive psychological attitudes showed significant positive influence on farmers' uptake of most studied sustainable practices. In contrast, limited access to credit and markets consistently served as barriers to adoption. Characteristics such as gender and household size showed correlations to adoption of some studied practices, although these results were more mixed and affected by study context. While our findings are similar to the results of previous reviews, our specific focus on rural areas across the globe suggests that the positive effects of gender, education, and adequate access to credit on adoption may be stronger in more rural or less developed regions. Our analysis further indicates that most adoption studies' models assumed a discrete binary approach to assessing adoption decisions, which may exclude the ability to capture discontinuation or re-adoption among farmers. Therefore, adoption literature would benefit from alternative approaches such as multivariate path-dependent analysis, which is particularly important for modeling factors with interactive relationships.

Sofie te Wierik, Fabrice DeClerck, Arthur Beusen, Dieter Gerten, Federico Maggi, Anna Norberg, Kevin Noone, Lena Schulte-Uebbing, Marco Springmann, Fiona H. M. Tang, Wim de Vries, Detlef van Vuuren, Sonja Vermeulen & Johan Rockström, 2025. Identifying the safe operating space for food systems. Nature Food. https://doi.org/10.1038/s43016-025-01252-6

#### **ABSTRACT**

Global environmental pressures from food systems threaten biodiversity and the stability of the Earth system, yet the safe operating space for food systems is unknown. Here we calculate food system boundaries as shares of planetary boundaries, proposing budgets for the food system across nine boundaries. Our results indicate that food systems are a critical driver of planetary boundary transgressions, dominating at least four transgressed boundaries (that is, biosphere integrity, land system change, freshwater change and biogeochemical flows) while strongly contributing to the transgression of two more (that is, climate change and novel entities). Moreover, global food systems are currently beyond all nine food system boundaries; moving to the safe operating space requires reducing related greenhouse gas emissions substantially, halting the conversion of intact nature to agriculture, redistributing fertilizer inputs, limiting pesticide and antibiotic use, and preserving critical freshwater flows without negatively affecting yields.



# 1. Climate, Migration and Health Nexus: Summer School 2026

3-6 February 2026

School for Climate Studies, Stellenbosch University

Contact: Dr Christian Lueme, the Summer School Facilitator at <a href="mailto:christianl@sun.ac.za">christianl@sun.ac.za</a>



# 2. Southern African Sustainable Energy Conference

24-26 June 2026

Skukuza Conference Centre, Kruger National Park, South Africa

Organised by the University of Pretoria, in collaboration with Stellenbosch University

#### https://sasec.org.za/

- The deadline for abstract submissions has passed. However, registration is open.
- The Southern African Sustainable Energy Conference (SASEC) focuses on research, development, and deployment of methodologies, technologies, and systems within the Southern African context and beyond, related to sustainable energy.
- This conference offers researchers, engineers, practitioners, decision-makers, and policymakers an opportunity to share and discuss recent developments in the field. Presentations at SASEC 2026 will be subject to the acceptance of an abstract.
- SASEC 2026 is held with the support of the Department of Science, Technology and Innovation.

Enquiries: Prof Willem le Roux, tel. 012 4202446, email: <u>willem.leroux@up.ac.za</u> or Fhatuwani Mulaudzi, tel. 021 8089474, email: fmulaudzi@sun.ac.za

# 3. Grassland Society of Southern Africa 26th Annual Congress

20-24 July 2026

Hybrid event to be held at Houw Hoek Hotel, Grabouw, Western Cape: <a href="https://grassland.glueup.com/event/61st-annual-congress-of-the-grassland-society-of-southern-africa-151840/">https://grassland.glueup.com/event/61st-annual-congress-of-the-grassland-society-of-southern-africa-151840/</a>

Abstract submissions opening soon. Congress 61 Abstract Topics:

- Rangeland Ecology & Management
- Livestock & Game management & Ecology
- Climate change & carbon
- Planted pastures
- Fire Ecology
- Bush encroachment & Alien Invasives
- Biodiversity & Conservation
- Communal Rangelands
- Restoration & Rehabilitation Ecology

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Interested persons who would like to get more information on SmartAgri and its related actions, are invited to contact Prof Stephanie Midgley: <a href="mailto:stephanie.midgley@westerncape.gov.za">stephanie.midgley@westerncape.gov.za</a>. Please subscribe to the SmartAgri Barometer if you would like to be updated on a regular basis.



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