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**BRIEFING PAPER** May 2022

## SEEDING SUCCESS AT COP27 FINANCING INNOVATION FOR AGRICULTURAL ADAPTATION IN AFRICA

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The profile of agriculture, land use, and food systems in addressing climate change was raised in 2021 through the UN Food Systems Summit and COP26 in Glasgow. However, with severe climate impacts on agricultural systems and a looming global food system crisis, public finance providers must deliver concrete plans and finance for agricultural resilience, bolstering food security for those most exposed to shocks.

The incoming COP27 Egyptian Presidency presents an opportunity to center the interests, needs, and contexts of African countries. COP27 in Sharm el-Sheikh is a moment for high-income countries to bolster issues of critical importance to low-middle income countries, particularly those in Africa. Investing in adaptation and building resilience in food and agricultural systems in Africa is critically important given the continent's exposure and vulnerability to climate impacts and the cascading impacts on food security, nutrition, prosperity, and political stability.

In 2022, with the AU Commission's Year of Nutrition and COP27 in Sharm el-Sheikh highlighting the critical need for finance for mitigation and adaptation, there is a clear opportunity to bridge climate and food security, creating lasting, high-quality avenues to support agricultural adaptation, grounded in an African-led agenda. The International Food Policy Research Institute (IFPRI) estimates \$1.7 billion additional international finance is required for agricultural innovation in Africa and the Middle East per year to adapt to the impacts of climate change on achieving the goal of zero hunger.<sup>1</sup>

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<sup>1</sup> IFPRI, 2021, <https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/134423/filename/134634.pdf>



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Given the scale and scope of the challenges, a multi-pronged effort will be required to mobilize and channel the resources needed. Five potential avenues for development agencies and funders to pursue, building momentum behind finance flows to innovation in agricultural adaptation in Africa include:

- **Building on the COP26 Glasgow Breakthrough on Agriculture** launched by the UK as the President of COP26 with the UK and Egyptian Presidencies championing the co-design of metrics for success and an implementation plan through to 2030 presented at COP27.
- **Ensuring the US-UAE led AIM4C launched at COP26 promotes innovation sprints that demonstrate best practice and strong engagement with farmers, local communities, and, where relevant, Indigenous Peoples in developing research.** AIM4C has mobilised \$4 billion USD with the aim to create a “quantum leap in agricultural innovation” to reduce agriculture’s impact on the climate<sup>2</sup>. Member finance providers – public and private - can leverage AIM4C’s platform and innovation sprints to support farmers that are set to experience the worst impact of climate change: those in Africa.
- **Re-setting the relationship between high-income economies and partner countries in low- and middle-income economies, placing agriculture and food security at the heart of this new relationship.** The UK and Germany can lead this effort as outgoing and incoming G7 Presidencies, respectively with the Glasgow Breakthrough on Agriculture as a framework for action and collaboration.
- **Repurposing existing R&D public budgets which are a key factor in making agriculture more climate smart,** oriented towards mitigation and adaptation and away from unsustainable agricultural practices that damage the climate and the environment and drive biodiversity loss.
- **Dedicated declaration on agricultural adaptation in Africa.** As global action on climate change to date has tended to marginalise the needs of low- and middle-income countries, a political declaration dedicated building on existing mechanisms and aimed at mobilising more investment in and policy attention on innovation is required to shift attention and resources to this crucial issue.

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<sup>2</sup> AIM4C, <https://www.aimforclimate.org/>



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## Agricultural adaptation in Africa underpins food security

Africa contributes the least to global emissions - less than 3% of the global total<sup>3</sup> - yet the continent, and especially African agriculture, are burdened with severe vulnerabilities to climate change. This is due, in part, to the projected intensity of exposure to climate change impacts across the continent. It is also due to the limited adaptive capacity of African agriculture. Given the importance of agriculture in African economies – accounting for over a third of total African GDP<sup>4</sup> and employing 50% of the labour force<sup>5</sup> -, its vulnerability is ominous.

### Impacts of climate change on African agricultural systems

Climate change presents significant challenges to the productivity and resilience of agricultural systems in Africa including water scarcity and drought, unreliable weather, new and migrating pests, and degraded soil health<sup>6</sup>. The Global Center on Adaptation (GCA) highlights that extreme heat, in addition to lowering yields, will increase stress on livestock and labour.

Climate change is already exacerbating food insecurity across Africa with many parts of the continent experiencing impacts on their agricultural sectors. For example, models indicate that temperature rises have already resulted in regional average yield reductions of 10–20% for millet and 5–15% for sorghum in West Africa.<sup>7</sup> As seen in Figure 1 below, under the worst-case climate scenario, crop yields are projected to decline by 13% in West and Central Africa, 11% in North Africa, and 8% in East and Southern Africa by 2050, with wheat crops declining significantly across all geographies<sup>8</sup>.

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<sup>3</sup> UNEP, <https://www.unep.org/regions/africa/regional-initiatives/responding-climate-change>

<sup>4</sup> World Bank, Development Indicators, 2020, <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS>

<sup>5</sup> ILOSTAT, Africa's Employment Landscape, 2019, <https://ilostat.ilo.org/africas-changing-employment-landscape>

<sup>6</sup> GCA, State & Trends in Adaptation, 2021, <https://gca.org/reports/state-and-trends-in-adaptation-report-2021/>

<sup>7</sup> Nature, Evidence of crop production losses in West Africa due to historical global warming in two crop models, 2019, <https://www.nature.com/articles/s41598-019-49167-0>

<sup>8</sup> WMO, State of the Climate in Africa 2019, 2020 [https://library.wmo.int/doc\\_num.php?explnum\\_id=10421](https://library.wmo.int/doc_num.php?explnum_id=10421)



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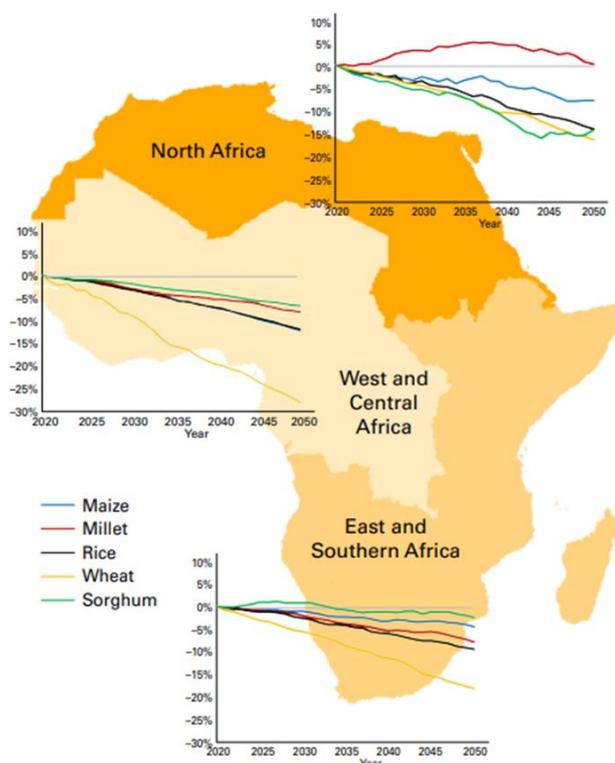


Figure 1: estimated crop yield reductions in Africa due to climate change.<sup>9</sup>

These decreases in yields will have knock-on effects on prosperity, health, food security, and political stability. The GCA estimates a 3-degree increase in global temperature by 2030 could reduce incomes by 8% for the poorest 40% of Africa's people. In this scenario, with falling agricultural productivity directly related to malnutrition, it is estimated that 350 million Africans will be undernourished by 2050 due to reduced access to food and decreased diet diversity.<sup>10</sup> This is compounded by demographic trends, with Africa recording the highest population growth rate worldwide, projected to double to 2.5 billion by 2050.<sup>11</sup>

The ongoing Russia-Ukraine crisis, and its global reverberations, serves as a stark example of how regional food system disruption can exacerbate food insecurity. In Africa, 23 countries – many experiencing climate impacts and rising food prices - are dependent on Russia and Ukraine for more than half the imports of at least one of their staple goods.<sup>12</sup> With climate change, the probability of multiple breadbasket failures increases resulting in inflated food prices in vulnerable, import-dependent regions such as Africa.

<sup>9</sup> WMO, State of the Climate in Africa 2019, 2020 [https://library.wmo.int/doc\\_num.php?explnum\\_id=10421](https://library.wmo.int/doc_num.php?explnum_id=10421)

<sup>10</sup> GCA, State and Trends in Adaptation, 2021, <https://gca.org/reports/state-and-trends-in-adaptation-report-2021/>

<sup>11</sup> Statista, 2022. *Forecast of the total population of Africa from 2020 to 2050*. Available online at: Africa: total population forecast 2020-2050 | Statista

<sup>12</sup> ONE Campaign, Rasna Warah, 2022, <https://www.one.org/africa/blog/rising-food-prices-africa-unrest/>



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For example, in April 2022, North Africa’s grain belt suffered its worst drought in 30 years<sup>13</sup> while the Horn of Africa experienced the driest conditions recorded since 1981, leaving 13 million people in North-East Africa facing severe hunger<sup>14</sup>. This has led to increased reliance on imports of staple foods at a time of high inflation with the Russia-Ukraine conflict exacerbating already high food prices. Egypt, which imports more than 80% of its wheat from Russia and Ukraine, is struggling to maintain its bread subsidy program on which 70 million Egyptians rely<sup>15</sup>. With the potential cascading risk of rising food prices fuelling civil unrest<sup>16</sup> – as seen following the 2007-08 food price crisis<sup>17</sup> – bridging the finance gap for agricultural adaptation is a security and geopolitical imperative.<sup>18</sup>

### Investing in innovation for resilient agriculture systems

An estimated 60-65% of the world’s uncultivated arable land is found in Africa, representing huge potential for the continent to reduce dependence on food imports, as well as a vast untapped resource for employment and wealth creation through exports of agricultural products.<sup>19</sup> Investing in the sustainability and resilience of agricultural systems in Africa is imperative if the continent is to take advantage of agriculture as an engine of growth – and more generally is critical for maintaining and improving food security, nutrition, and economic prosperity on the continent and beyond.

Many of the solutions that African farmers need to adapt to climate change — including weather information platforms, resilient seed varieties, water management technologies<sup>20</sup> - exist yet are not accessible to, or widely deployed among, smallholders. In the short term, scaling up the use of these technologies and practices could have significant impact. However, as climate impacts become more prevalent, timely and relevant research, development, and deployment (RDD) of innovations will become increasingly important to manage emerging risks and deliver adaptation and resilience outcomes.

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<sup>13</sup> USDA, Weekly Weather & Crop Bulletin, Vol 109, No.13

<https://www.usda.gov/sites/default/files/documents/wwcb.pdf>

<sup>14</sup> UNWFP, (2022) <https://www.wfp.org/news/13-million-people-facing-severe-hunger-drought-grips-horn-africa>

<sup>15</sup> Bloomberg, The \$120 Billion Global Grain Trade, 2022, <https://www.bloomberg.com/news/features/2022-04-05/will-russia-s-war-in-ukraine-cause-wheat-shortages-raise-food-prices-more>

<sup>16</sup> IFPRI, The Russia-Ukraine crisis poses a serious food security threat for Egypt, 2022, <https://www.ifpri.org/blog/russia-ukraine-crisis-poses-serious-food-security-threat-egypt>

<sup>17</sup> UNCTAD, Covid-19: A Threat to Food Security, 2020 <https://unctad.org/news/covid-19-threat-food-security-africa>

<sup>18</sup> ONE Campaign, Rasna Warah, 2022, <https://www.one.org/africa/blog/rising-food-prices-africa-unrest/>

<sup>19</sup> African Development Bank Group, 2016. *Feed Africa*. Available online at: Brochure\_Feed\_Africa\_-En.pdf (afdb.org)

<sup>20</sup> Brookings Institution, The Urgency and Benefits of Climate Adaptation for Africa’s Agriculture and Food Security, 2022, <https://www.brookings.edu/blog/africa-in-focus/2022/03/24/the-urgency-and-benefits-of-climate-adaptation-for-africas-agriculture-and-food-security/>



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While not a silver bullet, innovation, through new methods, varieties, and ways of gathering and sharing information with farmers, can play a critical role in helping farmers to adapt to climate change - for example, new seed varieties tested locally can both improve yields and/or reduce risk of loss from changing weather conditions.<sup>21</sup> The success of these innovations requires public and private investment in the ecosystem of actors and institutions that deliver and co-create relevant, usable solutions for smallholder farmers.

## The resilience gap: insufficient finance flows for innovation in agricultural adaptation

COP26 raised the profile of food and agricultural systems in the climate agenda, however, did not go far enough in mobilizing finance for the scale or scope of the challenges facing agriculture in Africa, and globally. In particular, the emerging and long-term impacts which will demand relevant RDD driven by African institutions and countries did not garner the attention or resources required.

### The finance gap for innovation agricultural adaptation in Africa

In 2021, the GCA<sup>22</sup> estimated that Africa will require, at least, \$331 billion through 2030, of which African countries expect to contribute ~\$66 billion from national budgets. The remaining gap of \$265 billion is expected to be met by international public finance providers and domestic and international financiers. However, only \$6 billion was tracked<sup>23</sup> in adaptation finance to Africa in 2017 and 2018, far off the pace to meet finance needs set out in African NDCs.

On agricultural adaptation specifically, climate finance from multilateral banks for the agricultural sector in Sub-Saharan Africa increased from \$433 million in 2015 to \$2 billion in 2018 before declining to \$1 billion in 2020.<sup>24</sup> As seen in Figure 2 below, most of this finance was for adaptation activities. However, in comparison to the projected need in NDCs, this still falls short. Adaptation finance generally and that finance targeting agriculture is scaling up too slowly to narrow the gap, even as the costs of climate impacts rise.

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<sup>21</sup> GIZ, Agricultural Adaptation: Six categories of good practices and technologies in Africa, 2017, <https://reliefweb.int/sites/reliefweb.int/files/resources/Agricultural-Adaptation-Report-Digital-lowres.pdf>

<sup>22</sup> GCA, State and Trends in Adaptation, 2021, <https://gca.org/reports/state-and-trends-in-adaptation-report-2021/>

<sup>23</sup> Finance tracked refers to (i) reporting from the members of the OECD's Development Assistance Committee and data publicly available through the Creditor Reporting System database; ii) dedicated reporting of the group of Multilateral Development Banks jointly reporting on climate finance and the members of the International Development Finance Club; and iii) Climate Funds.

<sup>24</sup> GCA, State and Trends in Adaptation, 2021, <https://gca.org/reports/state-and-trends-in-adaptation-report-2021/>

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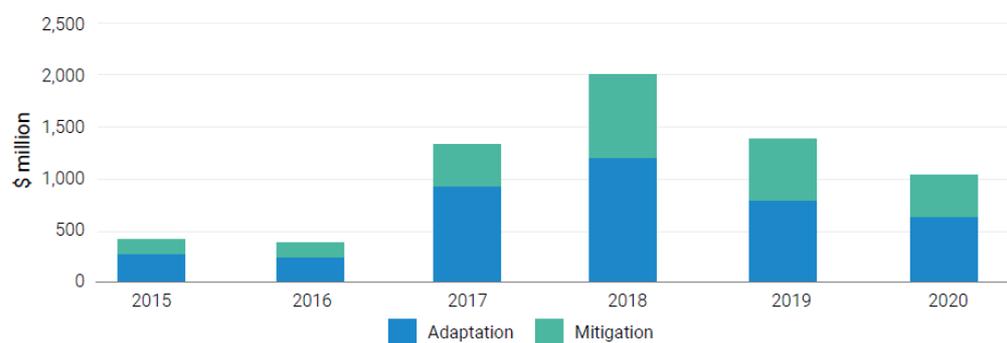


Figure 2: MDBs' climate finance flow to adaptation and mitigation activities in agriculture and land use in Sub-Saharan Africa from 2015 to 2020 (\$ million)<sup>25</sup>

Lastly, a recent study from the Commission on Sustainable Agriculture Intensification (CoSAI) modelled the need for public and private investment in agriculture relevant to the Global South. The study found that an additional \$4 billion is required per year for international public research institutions, national agricultural research, and extension systems in the Global South to offset the impact of climate change on achieving the SDG zero hunger goal.

The additional \$4 billion per year for research and extension is further broken down by region with the highest need projected in Sub-Saharan Africa (SSA) at \$2.2 billion per year for research and extension from domestic and international sources. Adding projected need for the Middle East and North Africa (MENA) – almost \$0.5 billion – the gap in funding for agricultural RDD in SSA and MENA is almost \$3 billion per year.<sup>26</sup> As shown in Figure 3 below, looking at international funding requirements alone, the study estimates an average of \$1.7 billion more for agricultural R&D in SSA and MENA per year, up to 2050, to adapt to the impacts of climate change on achieving zero hunger.<sup>27</sup>

<sup>25</sup> GCA, State and Trends in Adaptation, 2021, <https://gca.org/reports/state-and-trends-in-adaptation-report-2021/>

<sup>26</sup> CoSAI, 2021, [https://wle.cgiar.org/cosai/sites/default/files/CoSAI\\_Investment%20Gap%20Study.pdf](https://wle.cgiar.org/cosai/sites/default/files/CoSAI_Investment%20Gap%20Study.pdf)

<sup>27</sup> IFPRI, 2021, <https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/134423/filename/134634.pdf>



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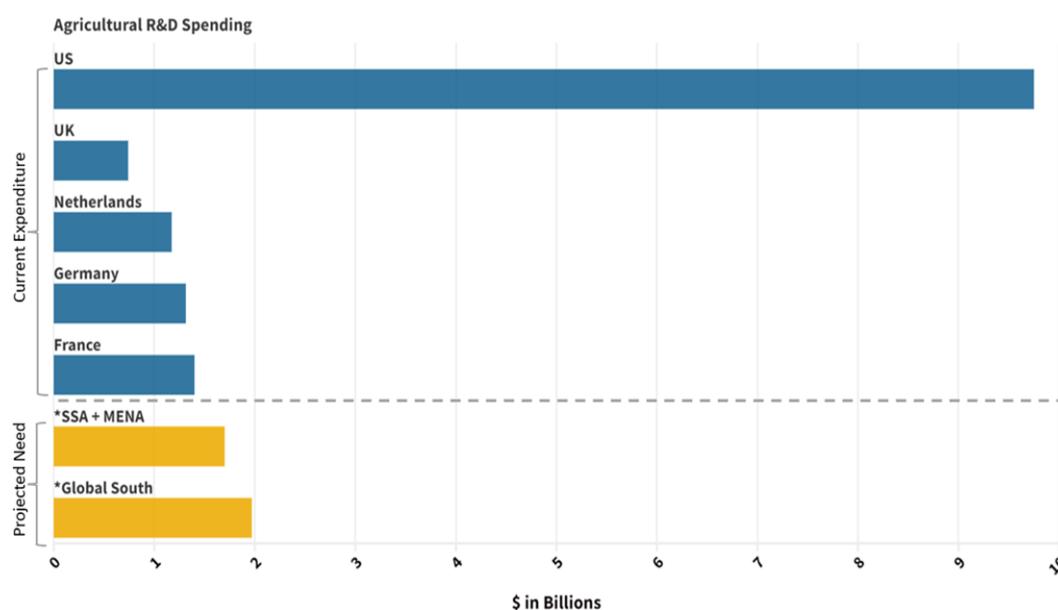


Figure 3: Comparison of recent domestic public and private agricultural R&D expenditure in High Income Countries versus projected agricultural R&D spending needs in Global South, Sub-Saharan Africa & Middle East, North Africa (\$ billions)<sup>28</sup>

While there is a clear gap in the level of international public support for agricultural adaptation innovation in Africa, any additional finance must also foster relevant solutions aligned with African priorities. For new investments to deliver for Africa, the RDD agenda must be driven by and through African institutions and align with and support continental priorities – increasing resilience, improving nutrition, and reducing poverty - as set out by the African Union Commission and its affiliated technical agencies<sup>29</sup>.

<sup>28</sup> The data for high income country spending on R&D in agriculture uses most recent data from [USDA, 2019; ONS, 2022; BMBF, 2022; OECD, 2022; Statistics Netherlands, 2014] including for France (2019), Germany (2020), Netherlands (2014), UK (2020), and USA (2014). The data for projected need sourced from CoSAI 2021 and IFPRI 2021.

<sup>29</sup> These include, but are not limited to, the African Union Development Agency (formerly NEPAD), the Forum for Agricultural Research in Africa (FARA), the sub-regional organizations (SROs) on agriculture research and coordination, the African Forum for Agricultural Advisory Services (AFAAS).



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## Call to Action: invest in agricultural resilience in Africa through innovation

As food and agricultural systems have risen on the climate agenda, so too have the number and variety of initiatives and mechanisms to address food system challenges. At COP26 alone, a multitude of initiatives were launched<sup>30</sup> however, the finance to address the scale of the challenges, particularly in exposed and vulnerable countries, has not yet materialized.

The stage is set for COP27 in Sharm el-Sheikh to focus on issues of critical interest to Africa, such as finance for adaptation and resilience in food and agricultural systems. The emerging challenges in these systems will require investment in RDD for relevant solutions from scientific breakthroughs to extension, and the protection and utilization of Indigenous knowledge. COP27 is a moment for finance providers to bolster support for these solutions.

Given the scale and scope of the challenge, a multi-pronged effort will be required to mobilize and channel the resources needed. Five avenues for development agencies and funders to pursue, building momentum behind finance flows to innovation in agricultural adaptation in Africa include:

1. **Follow-on to the COP26 Glasgow Breakthrough on Agriculture launched by the UK as the President of COP26.** The UK Presidency and incoming Egyptian Presidency should champion the co-design of a detailed set of metrics, together with the UNFCCC High Level Champions, and sector-specific experts and organisations, for how the Glasgow Breakthrough on Agriculture will be measured as part of the Global Stocktake Process. These can be presented at COP27 at the latest, together with a detailed timeline and delivery plan for implementation through to 2030.
2. **Ensuring the US-UAE led AIM4C promotes innovation sprints that demonstrate best practice and strong engagement with farmers, local communities, and Indigenous Peoples in developing research.** AIM4C has mobilised \$4 billion, aiming to create a “quantum leap in agricultural innovation” to reduce agriculture’s impact on the climate<sup>31</sup> and help the sector adapt. Member finance providers – public and private - can leverage AIM4C’s platform to target support for adaptation that addresses the needs and constraints of farmers and, with the right partnerships, AIM4C’s innovation sprints provide a vehicle for rapidly increasing investments in innovation that target and benefit African smallholder farmers.

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<sup>30</sup> E3G, 2021: <https://www.e3g.org/news/cop26-agriculture-and-land-takeaways/>

<sup>31</sup> AIM4C, <https://www.aimforclimate.org/>



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3. **Re-setting the relationship between high-income economies and partner countries in low- and middle-income economies, placing agriculture and food security at the heart of this new relationship.** The G7 provides a forum in which the UK forwarding the Glasgow Breakthrough on Agricultural, France with the recent non-paper on a Food and Agriculture Resilience Mission<sup>32</sup>, together with the German Presidency, can foster a re-set of the relationship between high-income and low- and middle-income economies. This re-set should place support for agricultural RDD at the heart of a solidarity offer for African countries to address the short-term impact of the emerging food crisis, the long-term drivers, and the need to build sustainable and resilient agriculture and food systems, reducing dependencies on international imports.
  4. **Repurposing R&D public budgets towards mitigation and adaptation and away from unsustainable agricultural practices** that damage the climate and the environment and drive biodiversity loss. The UK and incoming Egyptian Presidency should champion targets for repurposing of existing public sector and international financial institutions' agricultural budgets to focus on developing and incentivising the use of innovations that support more sustainable and resilient practices, and to identify ways in which the private sector can be encouraged to do the same.
  5. **Supporting a declaration on agricultural adaptation in Africa.** COP26 directed some attention to the role innovation can play in agricultural mitigation and adaptation. However, COP26 did not focus on the challenge of mobilising resources and attention to the specific and urgent needs of countries in Africa. A specific political declaration dedicated to mobilising more investment in and policy attention on innovation could help African agriculture and food systems adapt to climate change, building on existing mechanisms and emerging ones – such as the Egyptian COP27 Presidency's proposed initiative on food and agriculture.

Together, these avenues can build substantial and long-lasting momentum to support agricultural adaptation in Africa and beyond.

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<sup>32</sup> Ministry for Europe and Foreign Affairs, and the Ministry of Agriculture and Food, Joint Communiqué, 2022, <https://www.diplomatie.gouv.fr/en/french-foreign-policy/development-assistance/food-security-nutrition-and-sustainable-agriculture/news/article/food-security-implementation-of-the-farm-initiative-05-apr-2022>

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## About E3G

E3G is an independent climate change think tank accelerating the transition to a climate-safe world. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere.

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