T20 Policy Brief

Task Force 6
Accelerating SDGs: Exploring New Pathways to the 2030 Agenda

CREATING AN ENABLING ENVIRONMENT AND ACCELERATING SDGs THROUGH INCREASED PUBLIC FUNDING OF INNOVATIVE AGRICULTURAL RESEARCH AND DEVELOPMENT

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Abstract

G20 policymakers should strengthen the enabling environment for innovation in agriculture and food systems to unlock public funds to support researchers in developing their innovations. One way to implement this is through increased public funding for innovative agricultural research and development (R&D) efforts such as the Centre of Excellence in Science, Technology, and Innovation (CoE-STI) of the African Union Development Agency – New Partnership for Africa's Development (AUDA-NEPAD) and CGIAR[1] Accelerate for Impact Platform (A4IP).[2] CoE-STI brings in a focus on innovation and R&D capacities toward the commercialisation of genome-edited agricultural products to improve livelihoods. CGIAR A4IP promotes the acceleration of the Sustainable Development Goals and food systems progress by valorising and connecting science-based solutions and innovators to deploy impactful solutions on the ground.

The Challenge

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The state of global agricultural and food systems is characterised by unsustainable, fragile, and exploitative practices, the persistence of which is further contributing to the degradation of the climate and thus a positive feedback loop. The effects of climate change, such as weather volatility, resource scarcity, and worsening agricultural practices and outcomes, in turn exacerbate environmental harm.[3] Critically, marginalised populations, including women, youth, and those from the Global South, often bear the worst of the consequences of unsustainable and inequitable food systems, and are left without adequate support to manage the resulting harm.[4]

The political and economic conditions are inextricably linked to agricultural and food systems.[5] In the current knowledge-based and innovation-led economy, the achievement of key objectives and priorities defined in most of the national science and technology policies, national development plans, continental visions, and global agendas are only possible if scientific and technological activities are well implemented. As far as the Sustainable Development Goals (SDGs) are concerned, technological innovations are seen as a vital pathway, with the Addis Ababa Action Agenda (AAAA) becoming a key framework motivating novel and inventive technologies.

Increased gross domestic expenditure on agricultural and climate-focused research to support the translation and deployment of novel technologies that harness the power of genetics, automation and robotics, and big data could provide concrete solutions to farmers and their communities. This would optimise productivity and nutrition, minimise waste while addressing challenges such as biodiversity loss and deforestationcan, boost economic growth through productivity gains, and create jobs.[6]

The socio-economic impacts and opportunities of agricultural automaton, for instance, can be explored as a representation of the opportunities for SDG acceleration through innovation.

In the development of these innovations, such as emerging agriculture automation or biotechnology (for example, genetically modified crops), the primary focus is creating an enabling environment. These require a level of commitment to create a favourable regulatory framework and increased research spending. The target gross domestic expenditure on research and development (R&D) threshold for African countries is 1 percent compared to 3 percent among OECD member countries. However, the majority of African Union (AU) member states do not meet these goals.[7,8,9]

The G20's Role

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With greater investment in innovative agricultural R&D, public health can be strengthened as agricultural innovations can address issues of food security to ensure populations have available and accessible nutrition.[10] The sharing of the research advances from investing in agricultural innovation could encourage international and diplomatic collaboration between countries facing similar challenges, and more coordinated action toward the SDGs.[11] There are several policy implications for public investment in innovative R&D, many of which emphasise the role of the state in value creation.[12]

But underinvestment in innovative agricultural R&D is contributing to several barriers in the way of SDG acceleration:

- Scientists often do not have access to resources to de-risk the technological development or the commercialisation of their innovations. Research and development into nascent technologies is inherently fringe, such that common sources of funding for scientific research do not often support these endeavors with enough breadth or depth to reach the next level.

- Private sector capital may not be willing to bear the risk of investing in solutions at these pre-commercial and conceptual stages. Profit-driven private capital sources, mainly known in the context of R&D measurement as business enterprise sector,[13] may not be incentivized to devote resources to innovation efforts that have not yet proved profitable and scalable.

- Marginalised groups are vulnerable to issues of access to those technologies and insufficient involvement of these groups in the innovation and scaling processes. Innovation efforts for these technologies often do not prioritise the Global South, neglecting the importance of engaging those communities and marginalised groups to understand how agricultural innovation will affect them.

Recommendations to the G20

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The G20 countries can play an important role in overcoming the challenges for the development and deployment of technologies for sustainable agriculture and climate action. G20 policymakers can strengthen the enabling environment for innovation by funding to de-risk the technological development of the research to effectively deploy them. Public funding for early-stage scientific innovations, especially in the context of agricultural technologies meant to accelerate sustainable development, is a crucial tool.

- Public funding, from the central or federal government to the most remote municipality as a source of R&D funding, could provide security for scientists that want to explore more innovative and fringe technologies, who would otherwise be obligated to pursue research topics according to predetermined donor priorities. By providing a stable guarantee for funding such research, scientists may be able to valorise concepts more thoroughly with commercial potential into full technologies.
- Even though their potential return on investment is attractive, many innovations face long time-horizons to be developed (for instance, agrifood-tech and life-sciences), accrue revenue, and require high up-front costs to develop. For this reason, public actors are better positioned than the private sector to fund these at early stages. Public funding could provide a platform to sustain the technologies through the riskiest portion of their development, until other sources of capital have the appetite to invest.
- Government-sector funding could also ensure a more equitable and democratic innovation process for agricultural technologies. Where business enterprises may only focus on the easiest pathway to scale with highest profit, public funding could provide a backbone for innovation to target the context of the Global South, prioritise the needs of marginalised communities, and involve them throughout the development of solutions, and ensure democratised access to the technologies once available.

One example of an opportunity for investment to support innovative agricultural R&D is genome editing (GEd) capacity building in promoting international collaboration. Among the suggested pathways for G20 to support the ongoing work are the contribution to:

- Capacity strengthening efforts of researchers, policymakers, and regulators on the principles and applications of GEd in agriculture.
- Strengthening the establishment of an African genome-editing community of practice to share experiences, knowledge, and best practices across the continent.
- Fostering a broader understanding of GEd among different stakeholder groups in pilot countries; and
- Accompanying the development of communication strategy document and implementation plans during the lifespan of the initiative with the ownership of the document by the focus institution in the member state.

For an enabling environment for innovation to accelerate SDG progress, G20 policymakers must focus on increasing funding toward innovative agricultural R&D.

AUDA-NEPAD centre of excellence in science, technology, and innovation and CGIAR A4IP are suggested means of implementation to support this effort (see Appendix).

Attribution: Gianpiero Menza et al., "Creating an Enabling Environment and Accelerating SDGs Through Increased Public Funding of Innovative Agricultural Research And Development," *T20 Policy Brief*, July 2023.

Appendices

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The work of CGIAR Accelerate for Impact Platform (A4IP) is an example of the kind of venues by which G20 policymakers can strengthen the enabling environment for innovation by funding the development of such technologies to de-risk and effectively deploy them. Public investment into this kind of innovation at the early stage will make the difference in allowing scientists to innovate with more security, de-risk the innovations to a point at which other capital will support them, and ensure the development of the technologies engages and prioritises the necessary populations. Public investment in the development and adoption of science-driven innovations for sustainable agriculture and climate action is an integral case within the wider need for an increased gross domestic expenditure on research & development. CGIAR is an agricultural science and innovation for development organisation dedicated to transforming food, land, and water systems in a climate crisis. CGIAR is the world largest global agricultural research partnership via the work of over 8000 scientists, 3000 partners, and in 90+countries. A4IP is a venture space that builds on CGIAR's legacy in research and innovation to co-design, accelerate, and fund science-driven technologies to address some of the world's most pressing challenges. A4IP explores innovative partnership models to bridge research products from lab to market, all while funding the most visionary teams to leverage their scientific creativity.

The role of the African Union Development Agency- New Partnership for Africa's Development's centre of excellence in science, technology, and innovation (AUDA-NEPAD CoE-STI) is to provide governments with supports on policy enabling environments for genome editing and science-based communication strategies with action plans owned and driven by national governments. In so doing, AUDA-NEPAD advances the continental vision for transformation, Agenda 2063: The Africa We Want,[14] through its development aspirations. The support is aligned with national development plans. in respective member states and regional economic communities as well as at the continental stage, AUDA-NEPAD CoE-STI leverages its convening power and political mandate at all three levels to raise awareness, understanding, and support for the technology among key stakeholder communities engaging in broader technology outreach and awareness. A core role of AUDA-NEPAD CoE-STI is to identify and expose AU member states to problem-solving innovations whose application will augment and accelerate progress towards attainment of Agenda 2063's goals and targets and to also provide science- and evidence-based backstopping advisory support for the development and management of biotechnology and genome editing-related innovations. In this regard, support on genome editing are: (i) to give expanded number of member states' access to expert information and analysis on the issue of genome editing along intention to embrace emerging technological and management innovation to leapfrog productivity-production (advocacy and information support); and (ii) to provide Africa's related constituencies exposure, at all levels and across different sectors, to Africa's own science-based narratives on genome editing and its applications (potential) in driving economic growth and development ambitions particularly in the transformation of Africa's agriculture in alignment to the AU CAADP-Malabo Decision.[15] The goal is to set one target as "at least double agricultural productivity by 2025." Genome editing provides one of the technological innovations that will propel countries towards this goal. CoE-STI fosters this message and supports member states in policy and investment decisions in this regard.

Endnotes

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