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Contribution by Portugal

to the CSTD 2023-2024 priority theme on "Global cooperation in science, technology and innovation for development"

PRIORITY THEME 2: Global cooperation in science, technology and innovation for development

United Nations Commission on Science and Technology for Development (CSTD)

Dear CSTD Member,

The 26th CSTD annual session selected "Global cooperation in science, technology and innovation for development" as one of the priority themes for its 27th session (2023-24 period). This theme addresses SDG 17 "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development" at the 2030 Agenda.

Although the contribution of science, technology and innovation (STI) to the achievement of other sustainable development goals (SDGs) is discussed in every session of the CSTD, SDG 17 itself has not been specifically addressed for several years in the Commission. Interaction among CSTD members has resulted in several pilot programmes for international collaboration in STI. However, there is a need to consider from a broad strategic perspective the question of international collaboration in STI, including its digital dimensions. Under this priority theme the Commission could discuss the status of global STI cooperation (including coordination and funding) in knowledge creation and dissemination, the diffusion and sharing of technology and alternative modes of technology creation and distribution such as open-source approaches.

Under this theme, the Commission will examine how STI organizations at the global and regional levels collaborate better to scale up their impact on key development challenges; how to ensure that the international STI agenda is aligned with the development priorities of the Global South and includes adequate mechanisms for cooperation and sharing; and finally what could be the role of the CSTD in coordinating and imparting directionality to international STI collaboration and technology sharing.

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting to be held in the second half of October 2023 in Portugal. In this context, we would like to solicit inputs from the CSTD member States on this theme. We would be grateful if you could kindly answer the following questions based on your experience in your country or region.

1. What STI cooperative mechanism(s) at global or regional levels has your country joined in?

In 2006 the Portuguese Government, through the Fundação para a Ciência e Tecnologia (FCT), supported by the Conselho de Reitores das Universidades Portuguesas (CRUP), launched the International Partnerships, a strategic collaboration opened to all Portuguese Universities and R&D institutions mainly with leading American Universities, also involving several industrial partners. The International Partnerships included a set of leading American Universities and a European well-known applied research institution: the Massachusetts Institute of Technology - MIT (since 2006), Carnegie Mellon University – CMU (since 2006), University of Texas at Austin - UTAustin (since 2007), Harvard Medical School (HMS) (from 2009 to 2015) and the Fraunhöfer Portugal (since 2008).
For the period 2018-2023, the goPORTUGAL initiative reinforced and expanded the concept of international partnerships. In particular the US partnerships further their activities aiming to: foster the creation of qualified jobs and attraction of qualified human resources to Portugal; stimulate the scientific and technological development, with reference to the best international practices (including in the relation with companies and the productive fabric); stimulate scientific and business development and creating value through the development of new services, products and processes, fostering the creation and growth of new science and technology-based companies; to value Portugal's positioning in the world by attracting funding and mobilising various actors, both national and international, in terms of an innovative and integrative approach in all areas of knowledge with a focus on the Atlantic interactions research and innovation agenda.
The US Partnerships undertake activities focused in areas targeted for social and economic impact around three common pillars: (1) Research projects (Collaborative research between Portuguese and US research teams and Portuguese corporations); (2) Education and training (traditional and

executive masters and PhDs programmes, some of them dual); (3) Innovation and entrepreneurship activities (focusing on commercialisation, technology transfer and the creation of high-tech high-growth new ventures). The thematic areas chosen for International Partnerships take into account, on the one hand, the impact and the transformative potential of these areas in the Portuguese academy and economy, and, on the other hand, the competences of US universities, aiming to create a vibrant, interactive, and sustainable collaborative platform that addresses the complex challenges of global and societal impact.

Other initiatives we would like to highlight regarding cooperative mechanisms at global or regional levels are:

- *The "International Centre for Advanced Training in Fundamental Sciences of Scientists from Portuguese-Speaking Countries" (Centro Ciência LP) - This is a category 2 centre under the auspices of UNESCO and is a result of an agreement between the Portuguese Government and UNESCO. The centre aims to foster advanced training and scientific development in Portuguese Speaking Countries.*
- *The "Programa Ibero-americano de Ciência e Tecnologia para o Desenvolvimento" (CYTED) - Created in 1984, this programme fosters Ibero-American cooperation in the field of science and technology.*
- *Protocol FCT-AKDN: A Protocol of Cooperation between the Ministry of Science, Technology and Higher Education of the Portuguese Republic (MCTES) and the Ismaili Imamat was signed on May 2016. This partnership is embed in the Initiative Knowledge for Development and includes new actions for the revitalisation of the agenda "Ciência Global" with African Portuguese-speaking countries, launched in 2009, and strengthened and stimulated through this cooperation as well as other related actions, like the "Ciência LP" that aims to establish the launch of a new joint initiative aimed for the strengthening of the scientific and technologic academy cooperation with countries and regions in development, through the scientific empowerment directed for promising researchers with recognised experience, which tackles the current topics of global importance, promoting the multidisciplinary collaboration and that guaranties the financial resources and enough length to allow the effective impact in those regions and countries.*
- *Cooperation with Angola: The Action "Financing policies and practices for a global, ethical, innovative and relevant science and technology: dialogues between Angola, Mozambique and Portugal" is coordinated by the Foundation for Scientific and Technological Development (FUNDECIT) of Angola and the Foundation for Science and Technology (FCT), with the participation of the National Research Fund (FNI) of Mozambique. This action aims to create a partnership between the three agencies, conduct a benchmarking exercise on Science and Technology funding and organise three face-to-face workshops in Lisbon, Maputo and Luanda to discuss funding practices and instruments. This initiative encompasses the EU-Angola Dialogue Facility held, on 1 June, in Luanda, with the signing ceremony of the Action Implementation Agreements for 8 proposals selected in the 3rd Call for Proposals of this project financed by the European Development Fund.*

2. To what extent the existing cooperation programmes are aligned with the development priorities of participating developing countries?

The cooperation programmes that Portugal is part of are designed with a strong alignment to the development priorities of the participating countries. For example, the Centro Ciência LP is designed to foster advanced training and scientific development in Portuguese Speaking Countries, addressing the need for capacity building and scientific advancement in these nations.

On the other hand the 8 approved proposals selected in the 3rd Call for Proposals under the EU-Angola Dialogue Facility cover a wide variety of areas, all of which are essential to Angola's sustainable development. These areas include funding for ethical and innovative science and technology, human capital development, international business missions, promotion of competition, national development planning, public policy evaluation, and promotion of renewable energy, boosting institutional cooperation and the exchange of information and experiences.

Similarly, the CYTED programme, which fosters Ibero-American cooperation in science and technology, is also likely aligned with the development priorities of the participating countries, though the provided documents do not contain detailed information on this aspect.

The cooperation programmes between Portuguese institutions and their US partners, MIT, CMU, UTAustin have primarily focused on advancing research, education, and innovation in specific thematic areas. While these initiatives have not specifically mentioned alignment with the development priorities of participating developing countries, they can indirectly contribute to global development by addressing complex challenges and fostering socio-economic impact as providing practical solutions.

The thematic areas chosen for these partnerships encompass various fields that are relevant to societal and environmental concerns at a global level. These areas include Information and Communication Technologies, Climate Science and Climate Change, Sustainable Cities, Advanced Computing, Nanotechnologies, Medical Physics, Technology Innovation and Entrepreneurship, and more. By focusing on these areas, the initiatives aim to generate knowledge, develop innovative solutions, promote sustainable development and economic and societal impact.

In terms of potential alignment with the development priorities of participating developing countries, the cooperation programmes can indirectly contribute in the following ways:

- *Knowledge Transfer and Capacity Building: Through collaborative research projects and educational programmes, these initiatives facilitate knowledge transfer, skill development, and capacity building. This can enhance the expertise and capabilities of participating researchers, students, and professionals, which can be valuable in addressing development challenges in their home countries.*
- *Technology Transfer and Innovation: The initiatives promote technology transfer, entrepreneurship, and the creation of startups. This can facilitate the adoption and adaptation of innovative technologies in developing countries, supporting their economic growth, industrialisation, and competitiveness.*
- *Sustainable Development and Environmental Solutions: Thematic areas such as climate science, sustainable cities, and renewable energy address global challenges related to climate change, urbanisation, and environmental sustainability. The research outcomes and knowledge generated in these areas can provide insights and solutions that are relevant to developing countries' development priorities.*
- *Collaborative Research and Partnerships: The initiatives foster collaboration between researchers from different countries institutions and companies. This can create opportunities for joint research projects, exchange of ideas, and sharing of best practices. Such collaborations can contribute to building networks, fostering innovation ecosystems, and promoting international cooperation in science and technology.*

US Partnerships can indirectly contribute to the United Nations Commission on Science and Technology for Development's objectives of harnessing science and technology for sustainable development and promoting global collaboration in STI.

About the Fraunhofer Portugal: While the specific alignment with the development priorities of participating developing countries may depend on the specific projects and collaborations within Fraunhofer Portugal, the institution's overall focus on applied research, sustainability, technology transfer, and customer-oriented solutions can indirectly support the development priorities of participating developing countries. By providing practical solutions, fostering innovation, and promoting knowledge sharing, Fraunhofer Portugal contributes to the global agenda of sustainable development and addresses challenges that are relevant to developing countries. As an applied research institution, Fraunhofer Portugal focuses on developing practical solutions and fostering innovation in specific areas:

- *Sustainable Development: Fraunhofer Portugal's research centres, such as AICOS and AWAM (Research Center for Smart Agriculture and Water Management), address challenges related to sectors like health, agriculture, retail, energy, and water treatment. These areas are crucial for sustainable development, food security, and resource management, which are often priorities for developing countries.*
- *Technology Transfer and Knowledge Sharing: Fraunhofer Portugal promotes technology transfer by collaborating with companies and stakeholders. This transfer of knowledge, expertise, and technology can benefit developing countries by providing access to innovative solutions, enabling technology adoption, and facilitating capacity building.*
- *Customer-Focused Research: Fraunhofer Portugal conducts applied research with a customer-focused approach, aiming to provide cutting-edge solutions that address real-world challenges. This approach aligns with the development priorities of participating developing countries, as it*

focuses on creating practical, market-driven solutions that can have a tangible impact on their socio-economic development.

- *Circular Economy and Sustainable Practices: AWAM, in particular, focuses on research areas related to sustainable crop products, water treatment, and bioenergy. These topics are relevant to developing countries striving for sustainable agricultural practices, efficient resource management, and environmental stewardship.*

3. What are the main outcomes of such mechanism(s)? And what are the impacts of the resultant cooperation on your country? Pls. include the gender dimension.

Under the Protocol FCT-AKDN it was possible to establish a commitment of 10 million euros over the 10-year duration of the Protocol (2016-2026), with 4.8 million euros having already been allocated to support projects selected for funding in the two tenders already launched, as detailed below, to which was added an investment by FCT in the same amount and for the same purpose:

- *1st Call (2017): 16 projects were funded with a joint investment by FCT and AKDN of 4.6 million euros, with partners from institutions in 8 African countries: Angola, Cape Verde, Guinea-Bissau, Mozambique, Nigeria, Tanzania, São Tomé and Príncipe and South Africa.*
- *2nd Call (2019): 21 projects were funded with a joint investment by FCT and AKDN of 5 million euros, - with partners from institutions in 13 African countries: South Africa, Angola, Burkina Faso, Cape Verde, Ghana, Guinea-Bissau, Morocco, Mauritania, Mozambique, Namibia, Nigeria, Tanzania, São Tomé and Príncipe.*

Overall, the US Partnerships promoted the internationalisation of Portuguese scientific and higher education institutions, fostering innovative projects and the mobility of highly qualified human resources through new thematic knowledge networks involving more than 1000 teachers and researchers and more than 1500 master's and doctoral students. More than 300 companies in Portugal have been actively engaged in their multiple education, research, and innovation activities, with a special focus on high-tech high-growth new ventures. The entrepreneurial culture of the partnerships supported initiatives have had an impact on more than 200 startups. More than 220 projects were funded, including strategic (large 3 years projects) and exploratory projects (one year), engaging Portuguese and US researchers as well as more than 150 Portuguese companies. We highlight the following impacts:

- *Enhanced Research and Innovation Ecosystem: The programmes have strengthened the research and innovation ecosystem in Portugal by fostering collaboration, promoting interdisciplinary research, and facilitating the transfer of knowledge and technology.*
- *Economic Growth and Job Creation: The initiatives have contributed to economic growth by supporting the development of innovative industries, the creation of startups, and the commercialisation of research outcomes. They have also facilitated the attraction of qualified human resources and investment to Portugal.*
- *Human Capital Development: The programmes have played a significant role in developing human capital by providing high-quality education and training opportunities. They have produced a pool of highly skilled graduates, researchers, and entrepreneurs who can contribute to the country's development.*
- *Internationalisation of Portuguese Institutions: The collaborations with internationally renowned institutions have increased the international visibility and reputation of Portuguese universities and research centers. This has facilitated further partnerships, increased access to international funding opportunities, and promoted Portugal as a destination for research and innovation.*

Regarding Centro Ciência LP the main outcomes and impacts are:

- *By the end of June 2023, 15 calls for PhD grants were completed resulting in around 200 students from Portuguese Speaking Countries in Africa attending classes in Portuguese Higher Education Institutions or finishing administrative procedures and 2 new calls will still be launched in 2023. From these, 30% are women.*
- *In two Editions, six Merit Medals were awarded to scientific thesis, all from Portuguese Speaking Countries in Africa authors, half being delivered by female researchers.*
- *Ongoing build up of Ciência LP Network, open to Portuguese Speaking Countries in Africa Researchers, including the PhD grantees.*
- *Privileged relationships established with the main universities from Portuguese Speaking Countries in Africa, at a dean's level, as well as at researchers' level.*

- *Local governments at science and higher education areas, institutional support to Ciência LP initiative and activities.*
- *Successful implementation of mission and annual objectives, with high local impact in strengthening institutions in targeted countries, framed by UNESCO values, in line with UN 2030 Agenda and within the priorities of the AU-EU Agendas.*

4. What are the main difficulties member countries have encountered or are facing when implementing the cooperation mechanisms?

- *Funding and Resource Allocation: Adequate funding and resource allocation can be a significant challenge.*
- *Cultural and administrative divergences: Differences in administrative structures, decision-making processes, and legal frameworks can create complexities and delays in implementation.*
- *Monitoring and Evaluation: Establishing robust monitoring and evaluation mechanisms to assess the progress, outcomes, and impacts of cooperation mechanisms can be challenging. Developing appropriate indicators, collecting data, and conducting evaluations across multiple countries and projects require careful planning and coordination.*
- *National cooperation between institutions: Coordinating activities between the Portuguese institutions during the first couple of years of the US Partnerships were a significant hurdle, but afterwards the Portuguese STI has become more cooperative. This meant a culture change facilitated by the US partnerships Programmes.*
- *The implementation of joint activities within the Protocol FCT-AKDN (open calls) is fully managed by FCT and does not directly involve the AKDN (only required to validate the process) or the African institutions applying for funds. In accordance, there are no significant difficulties in implementation. In the follow-up of the project phase, financial reporting regulations sometime raise constraints and doubts due to different national legislations.*

5. In respect of achieving the objectives and goals, what are the factors contributing to the success or failure of the cooperation mechanism(s) that your country has joined in?

- *A key factor of success is the alignment of best practices, norms and regulations and the correct understanding and compliance with them. Also to maintain close regular communication channels with all partners involved (contact points), to ensure the fulfilment of tasks, deadlines, submission of deliverables, etc.*
- *For instance, regarding the alignment of Portuguese strategic for science and technology and the competences of the US Institutions and Fraunhofer under the "goPortugal" initiative, clearly defining the objectives and aligning them with the priorities and needs of participating institutions and Portugal was crucial. A shared understanding of the goals helps to focus efforts and ensure that the cooperation mechanisms are designed to address specific challenges or opportunities. Also, concerning the coordination models, a strong leadership and commitment at coordination is crucial: the coordination has two offices, one in Portugal and another in the US; in CMU and UTA, a Portuguese national serve as a director which facilitates the communication and fosters a collaborative culture among all stakeholders.*
- *Adequate funding and resources: Sufficient funding and resources are critical for the implementation and sustainability of cooperation mechanisms. Adequate financial support enables the development of research projects, infrastructure, educational programmes, and other initiatives necessary to achieve the objectives of the programmes.*
- *Monitoring and evaluation: Establishing robust monitoring and evaluation mechanisms helps track progress, measure impact, and identify areas for improvement. Regular evaluation of the cooperation mechanisms enables evidence-based decision-making, fosters accountability, and ensures the achievement of desired outcomes.*
- *Involvement of prestigious partner Institutions: Some programmes offer collaboration opportunities with world-renowned universities and research institutions. The reputation and expertise of these institutions attract talented researchers, students, and industry partners.*
- *Interdisciplinary approach: Programmes should encourage interdisciplinary collaboration, allowing participants to work across different fields and domains. This approach fosters cross-*

pollination of ideas, encourages innovation, and promotes the development of holistic solutions to complex societal challenges.

- *Scientific areas addressed aligned with SDG and approach to global problems: By aligning with the SDGs, some programmes demonstrate their commitment to addressing these challenges and creating positive societal impact. This relevance enhances the attractiveness; increases the potential for partnerships and collaborations with other organisations, both within and outside the participating countries and has global recognition and reputation.*
- *Mobility and international networking opportunities: These programmes facilitate international mobility, enabling researchers, students, and faculty to engage in cross-border collaborations, exchange programmes, and networking opportunities. The exposure to diverse perspectives, cultures, and research environments enhances personal and professional growth.*
- *Entrepreneurship and innovation focus: Some programmes emphasise entrepreneurship and innovation, providing participants with the tools, resources, and support to translate research outcomes into real-world applications. The focus on commercialisation, technology transfer, and the creation of high-tech startups cultivates an entrepreneurial mindset and creates opportunities for economic growth and job creation.*

6. In your country's view, what role could CSTD play in coordinating and imparting directionality to international STI collaboration and technology sharing?

We believe that CSTD can play several key roles in coordinating and imparting directionality to international STI collaboration and technology sharing:

- *Policy harmonisation and advice: CSTD can work towards harmonising policies across countries to create a conducive environment for international STI collaboration. It can facilitate dialogues, provide platforms for policy exchange, and help member states align their STI policies to common global objectives. CSTD can also provide policy recommendations and best practices tailored to the specific needs and conditions of smaller and/or lower performing countries and regions. by helping them to understand the potential impacts of various science, technology, and innovation initiatives and guide them towards making strategic policy decisions.*
- *Capacity building: CSTD can help in capacity building of developing and least developed countries. It can organise programmes to train researchers and innovators and strengthen the institutional framework of these countries to help them actively participate in and benefit from international STI collaboration. CSTD can also help organising training programmes and workshops for policymakers and stakeholders in smaller and/or lower performing countries and regions to equip them with the necessary skills and knowledge to effectively manage STI initiatives and collaborations. This could include training on patent laws, technology transfer processes, R&I strategies, etc.*
- *Promotion of fair and equitable sharing: By providing guidelines and encouraging policies that promote fair and equitable sharing of technology, CSTD can ensure that all countries, irrespective of their development status, can benefit from the advancements in STI.*
- *Addressing Global Challenges: CSTD can help align international STI collaboration towards addressing global challenges such as climate change, global health issues, food security, etc. It can provide a platform for sharing best practices and innovations to tackle these challenges.*
- *Fostering dialogue and cooperation: CSTD can play a key role in fostering international partnerships, by providing a platform for engagement between different stakeholders such as governments, research institutions, private sector, civil society, etc. It can also facilitate dialogue and cooperation between smaller and/or lower performing countries and larger, more technologically advanced countries by establishing joint ventures and collaborative research initiatives that allow access and benefits from advanced technologies.*
- *Resource mobilisation: CSTD can assist smaller and/or lower performing countries and regions in mobilising resources needed for STI collaboration and technology sharing. This could involve linking with potential donors, investors, and funding sources, as well as guidance in the effective use of these resources.*
- *Advocacy: CSTD can advocate for the needs and interests of smaller and/or lower performing countries in international forums and negotiations related to STI. This could involve highlighting the specific challenges faced by these countries, lobbying for more equitable technology*

sharing practices, and pushing for the removal of barriers that hinder certain countries and regions from fully participating in STI collaborations.

- *Promoting open science: CSTD can promote the principles of open science, encouraging the sharing of research data and findings, thereby accelerating scientific discovery and innovation, while also ensuring equitable access to STI.*
- *Monitoring and assessment: CSTD can help in monitoring and assessing the progress of international STI collaboration and technology sharing. This could involve developing indicators and benchmarks to track progress, identifying bottlenecks, suggest improvements, and provide reports to guide future initiatives.*

To achieve these roles effectively, CSTD needs to work closely with member states, international organisations, academic institutions, private sector, and civil society, and promote a collaborative and inclusive approach towards STI collaboration and technology sharing.

Please indicate contact person(s) responsible for projects/policies and international collaboration in this context in case we need clarification on the inputs.

Please send your responses and any further inputs on the theme to the CSTD secretariat (stdev@unctad.org) by **15 August 2023**. We look forward to receiving your valuable inputs.

Sincere regards,

CSTD secretariat