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Contribution by UNTBLDC

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Un Technology Bank is a global organization dedicated to enhancing the contribution of science, technology and innovation for sustainable development in the world's 45 least developed countries (LDCs).

As technology deficient countries, LDCs rely on transfer of technology from abroad to build their domestic technological capabilities. However, while transfer of technology is an important channel for acquiring technologies, it is not, by itself, sufficient for inducing technological learning and upgrading. Effective utilization and deployment of acquired technologies and their assimilation, absorption and scaling up will depend on the level of development of domestic STI capacity and the policy and regulatory environment that supports the STI ecosystem.

Since 2019, the UN Technology Bank has been carrying out Technology Needs Assessments (TNAs) in LDCs. The main objective of TNAs is to identify the technologies and technical know-how that LDCs require to tackle key development challenges. In the long run, these assessments aim to help LDCs develop the technological and innovative capabilities needed for growth, structural transformation, and the achievement of the Sustainable Development Goals (SDGs). TNAs serve as valuable policy tools for identifying specific areas where appropriate technological solutions can assist LDCs in overcoming developmental obstacles.

It is easy to say that TNAs are the step before Technology Assessments, as they utilize a participatory approach to support national stakeholders identify which are the priority technologies that need to be implemented. TNAs also include a brief overview on implications of the identified technologies. Going forward, the TNAs will embed foresight in the analysis and selection of technologies to be prioritized.

The UN Technology Bank TNAs are guided by the following key principles:

1. Prioritization: Focus on a limited number of sectors or economic activities that the country has identified as priority areas in its national development strategy.

2. STI Ecosystem Assessment: Provide a clear picture of the country's Science, Technology, and Innovation (STI) ecosystem and its capacity to absorb or effectively utilize technological solutions.

3. Suitability and Relevance: Concentrate on technological solutions that are appropriate for the country's level of development and relevant to its specific needs. Include youth, underrepresented groups, and gender perspectives in the analysis.

4. Environmental Sustainability: Prioritize technologies that offer low or zero emissions solutions and those that address adaptation needs, given the growing importance of environmental sustainability.

5. Government Ownership: Ensure government ownership of the TNA process, its results, and subsequent follow-up actions.

6. Cross-Sectoral Approach: Establish a cross-sectoral TNA committee and ensure broad stakeholder consultation, including with the private sector, academia, research centres, and non-governmental organizations, recognizing that science and technology span various sectors.

7. Expert Involvement: Identify and involve a group of technology experts to pinpoint and evaluate priority technologies.

Through TNAs it is possible to prioritize the needs in the related countries, trying to achieve a tangible result. The results from the TNAs provide the country with a technology implementation plan (TIP) for their technological development that contribute towards the achievement of the 2030 Agenda.

The Technology Needs Assessments (TNAs) employ a mixed methodology approach, heavily emphasizing qualitative methods such as interviews with representatives from diverse stakeholder groups, including government, universities, the private sector, development banks, and other interest groups. Focus group discussions are also used to build consensus, especially when determining priority needs and technology sectors. TNAs encompass a broad conceptualization of technology, considering it as systematic knowledge and skills used in production or service delivery, which can be based on science, research, or experience and may be embodied in products, blueprints, or processes. The TNAs aim to identify, prioritize, and plan the implementation of technologies that

address a country's priority needs, ensuring alignment with the country's policies and context. The UN Technology Bank has completed 14 TNAs in the least developed countries. Here are some examples of our work:

- Science, Technology and Innovation Review and Technology Needs Assessment for the Kingdom of Bhutan, in collaboration with UNESCO, which resulted in the Hear, Listen, Speak. A programme that grants access to education to many non-hearing children under the age of 14.
- Science, Technology and Innovation Review and Technology Needs Assessment for the Kingdom of Cambodia. This TNA was possible thanks to the collaboration of the Cambodia Ministry of Industry, Science, Technology & Innovation and the entire General Department of Science, Technology, and Innovation.
- Science, Technology and Innovation Review and Technology Needs Assessment for the Gambia conducted in collaboration with UNESCO, which resulted in Post-Harvest Loss Management for Cashew Production in The Gambia project

As it can be noticed from the examples, the UN Technology Bank primarily focuses on the Least Developed Countries (LDCs), which, while being among the most in need of technological development, also present some of the greatest challenges.
One significant challenge we encountered is the sheer breadth of technological development required across multiple sectors. This makes it difficult during Technology Needs Assessments (TNA) to prioritize and persuade governments on which sector should take precedence and why it might be more beneficial over another.
Additionally, many LDCs face a complex array of challenges that impede their progress. These countries often lack basic infrastructure, including reliable electricity, internet connectivity, and transportation networks, making it challenging to implement and sustain technological initiatives. Moreover, financial constraints limit their ability to invest in new technologies and maintain existing systems, as securing funding for technological advancements often competes with other urgent needs such as healthcare, education, and food security. There is also a shortage of skilled professionals and technicians in many LDCs, which hinders the development, implementation, and maintenance of technological solutions. Educational systems in these countries struggle to provide the necessary training and skills development. Furthermore, governmental, and institutional frameworks may lack the capacity to support large-scale technological projects, including challenges in policy formulation, regulatory oversight, and effective coordination among various stakeholders. Political instability, conflict, and social unrest in some LDCs can disrupt development projects and make long-term planning difficult. Additionally, these countries are particularly vulnerable to environmental challenges such as climate change, natural disasters, and resource depletion, which can divert attention and resources away from technological development. These challenges highlight the immense need for targeted support in building capacity and prioritizing technological advancements.
In addition to all the issues stated above, another major constraint is the limited capacity within the UN Technology Bank itself. Despite being a small organization, the UNTB is tasked with extensive evaluations of technologies, which is a demanding process.
However, the UN Tech Bank must concentrate on LDCs, not only because it is in the mandate but also because these countries belong to the most fragile category that urgently requires assistance, even though they are more challenging to work in. Our efforts are imperative for providing these countries with the necessary support to build their technological capabilities and improve their developmental outcomes.

Even though UNTB did not conduct any ForSTI and TA, however, the UN Tech Bank is envisaging to connecting ForSTI with the work of TNAs to make anticipatory recommendations on technological investment priorities at the national level.

In conclusion, the TNAs have significantly enhanced STI (Science, Technology, and Innovation) decision-making in LDCs which possibly also brought to the prioritization, design, and implementation of STI policies. TNAs have provided and are providing a structured framework for gathering and analysing data, which has enabled policymakers to make more informed decisions. These comprehensive assessments help identify the most pressing technological needs and opportunities within the LDCs, ensuring that policies are based on robust evidence. Through detailed Technology Needs Assessments, the UN Technology Bank has been able to prioritize the most critical technological requirements that align with the LDCs' development goals. This prioritization ensures

that resources are directed towards areas with the highest potential impact on sustainable development and economic transformation. By understanding the specific strengths, weaknesses, opportunities, and threats within the STI environment of each country, the UN Technology Bank has helped tailor policies that address unique national contexts and challenges. The development of detailed Technology Implementation Plans as part of the TNAs has provided clear roadmaps for realizing prioritized technologies. TNAs processes have encouraged broad stakeholder engagement, including representatives from government, academia, the private sector, and civil society, fostering a sense of ownership and collaboration among all stakeholders involved in the STI ecosystem.