
UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
CSTD
COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT
2024-2025 CSTD Intersessional panel
Technology Foresight and Technology Assessment for Sustainable Development
22 October 2024
UN trade & development
UNCTAD
60 years

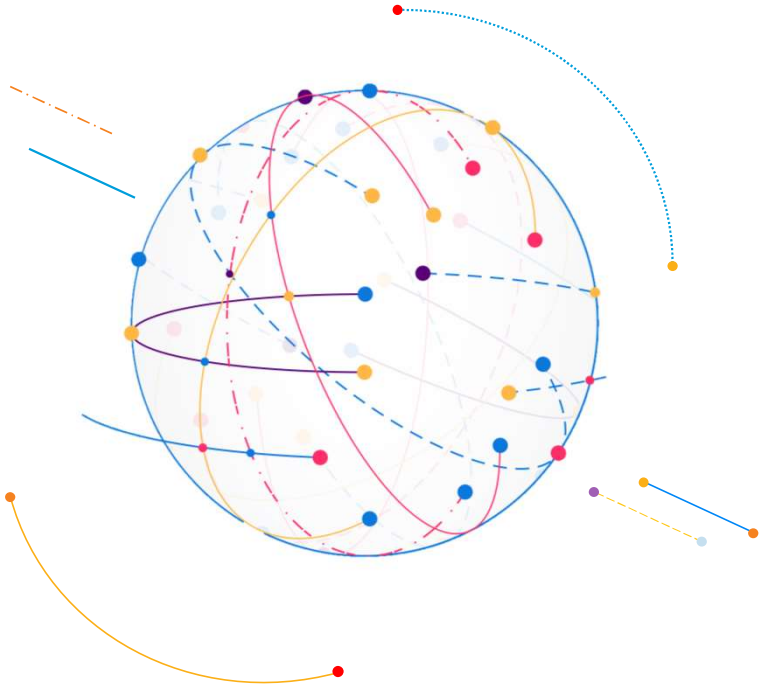
1. United Nations Resolutions
2. Definitions of Technology Foresight (TF) and Technology Assessment (TA)
3. Roles of TF/TA in Policymaking
4. TF/TA for Transformative Innovation Policies
5. Challenges in Implementation
6. Recommendations

UN General Assembly (GA) and ECOSOC Resolutions

United Nations
General Assembly

UN GA Resolution A/RES/78/160 on Science, Technology and Innovation for Sustainable Development:

Encourages all stakeholders to explore ways and means of conducting inclusive national, regional and international **technology assessment and foresight exercises** on existing, new and emerging technologies to help to evaluate their development potential and mitigate possible negative effects and risks.



United Nations
Socio-Economic
Council (ECOSOC)

ECOSOC Resolution E/RES/2023/4 on Science, Technology and Innovation for Development:

Conduct TA/TF exercises **as a process to encourage structured debate** among all stakeholders towards creating a shared understanding of the implications of **rapid technological change;**

Undertake strategic foresight initiatives on global and regional challenges at regular intervals and cooperate towards the establishment of **a mapping system to review and share technology foresight outcomes;**

CSTD to explore ways and means of conducting international technology assessments and foresight exercises

Defining TF and TA

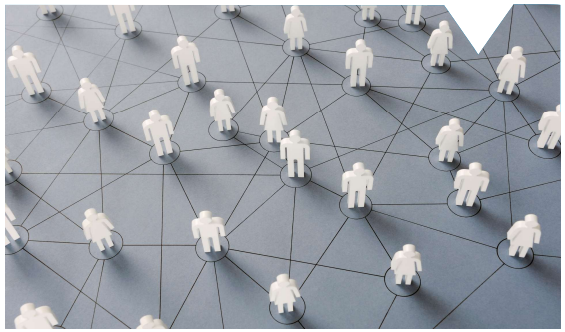
Technology Foresight (TF): **TF** involves a systematic process for anticipating technological changes over the long term. **ForSTI** looks at STI more broadly. **Strategic foresight** is broader, anticipating future scenarios in diverse areas.

Technology Assessment (TA): **TA** is focused on evaluating the **short- to medium-term** impacts of the development or adoption of technologies. It aims to contribute to public dialogue, provide policy advice and/or shape technologies.

Defining TF and TA

Differences and complementarity: While TF focuses on long-term strategic planning, TA addresses primarily short-term to medium-term impacts of emerging and new technologies. Together, they provide a comprehensive strategic intelligence framework for anticipating and addressing technology-driven change.

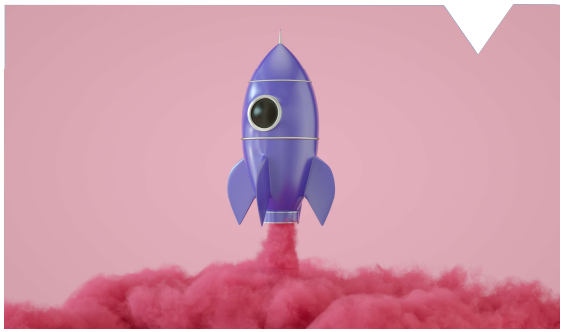
TF & TA for Transformative Innovation Policies



System-Oriented Approaches

TA: Assesses interactions of technological solutions within regulatory frameworks and markets, highlighting governance gaps.

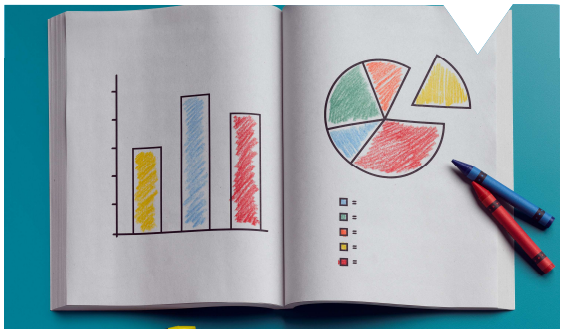
TF: Explores future systemic impacts and fosters long-term strategic planning for innovation ecosystems, enabling collective action.



Mission-Oriented Innovation Policies

TA: Provides insight into regulatory needs and evaluates the readiness of technologies for implementing high-risk/high-reward projects.

TF: Anticipates future technological challenges and aligns R&D efforts with societal missions and values.



Continuous Learning and Feedback

TA: Embeds evaluation to adapt policies based on real-time feedback and outcomes.

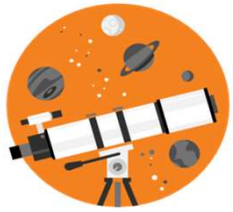
TF: Supports flexibility in long-term plans by identifying new opportunities and risks through iterative foresight.

Roles of TF and TA

- **Policy Guidance for Rapid Technological Change:** TF and TA provide policy frameworks that can identify benefits and risks, and help use technology for sustainable development.
- **Addressing Societal Concerns:** Stakeholder inclusion through TA and TF allows for broader societal perspectives, and more inclusive and evidence-based decision making.
- **Identification of Out-of-the-box Solutions:** TA/TF can challenge existing visions of the future and offer alternative forward-looking perspectives, broaden the scope of strategic thinking and help to harness benefits and mitigate risks.

Examples of TA/TF

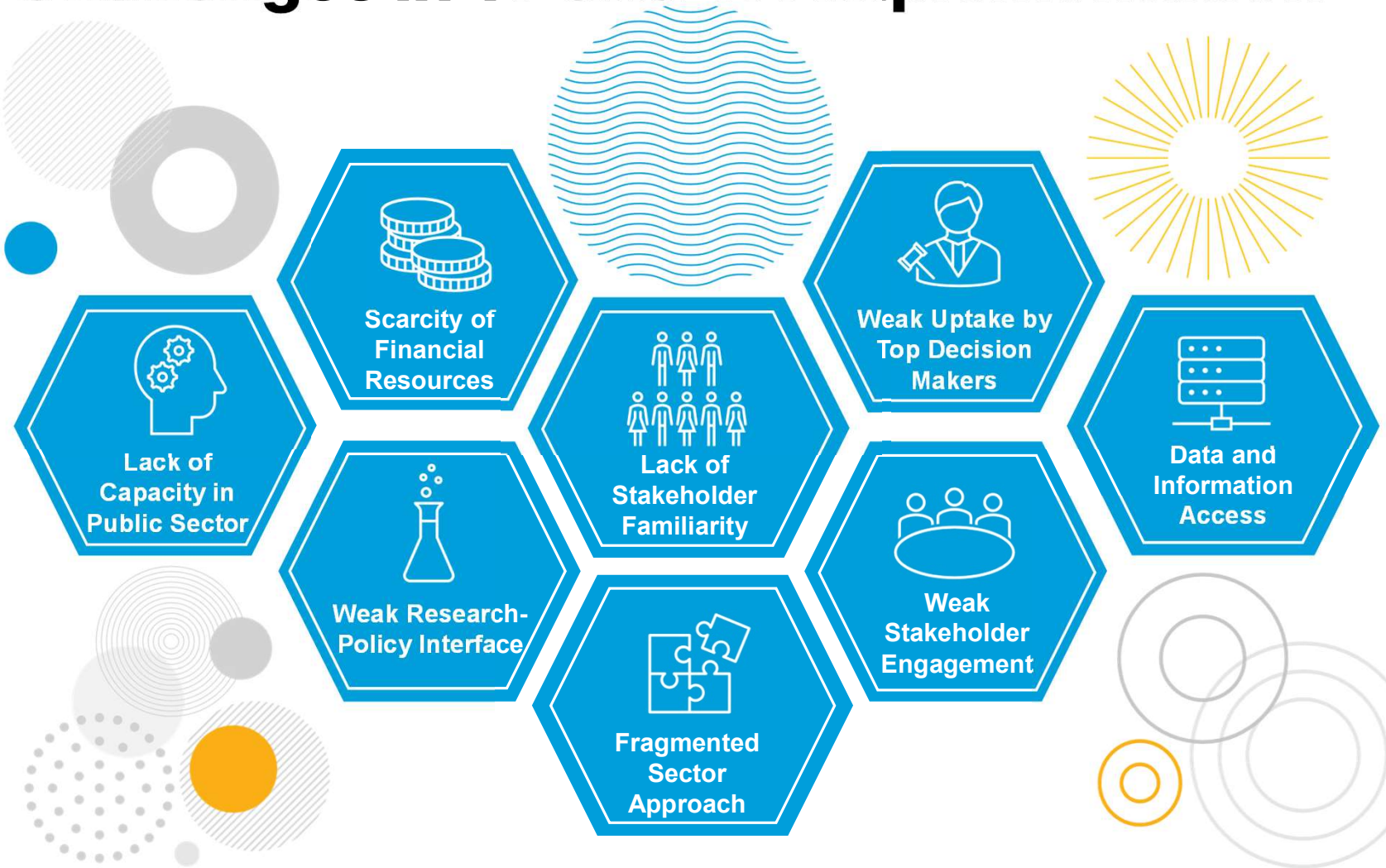
- The **Fossil Free Sweden** is a **TF exercise** guiding Sweden's transition to carbon neutrality by 2045. It unites stakeholders to create sector-specific roadmaps, such as **green steel production and energy-efficient building** practices. These roadmaps tackle technological, financial, and regulatory challenges, and through scenario planning, the initiative ensures Sweden's strategies are resilient and adaptable to future changes.



- The **NASA Asteroid Initiative** is an example of **participatory Technology Assessment (pTA)**, conducted in collaboration with the **Expert and Citizen Assessment of Science and Technology (ECAST)** network. This participatory approach provided valuable insights from the public, helping NASA better understand societal perspectives on space hazards and guide its policy on **asteroid detection and planetary defense**.

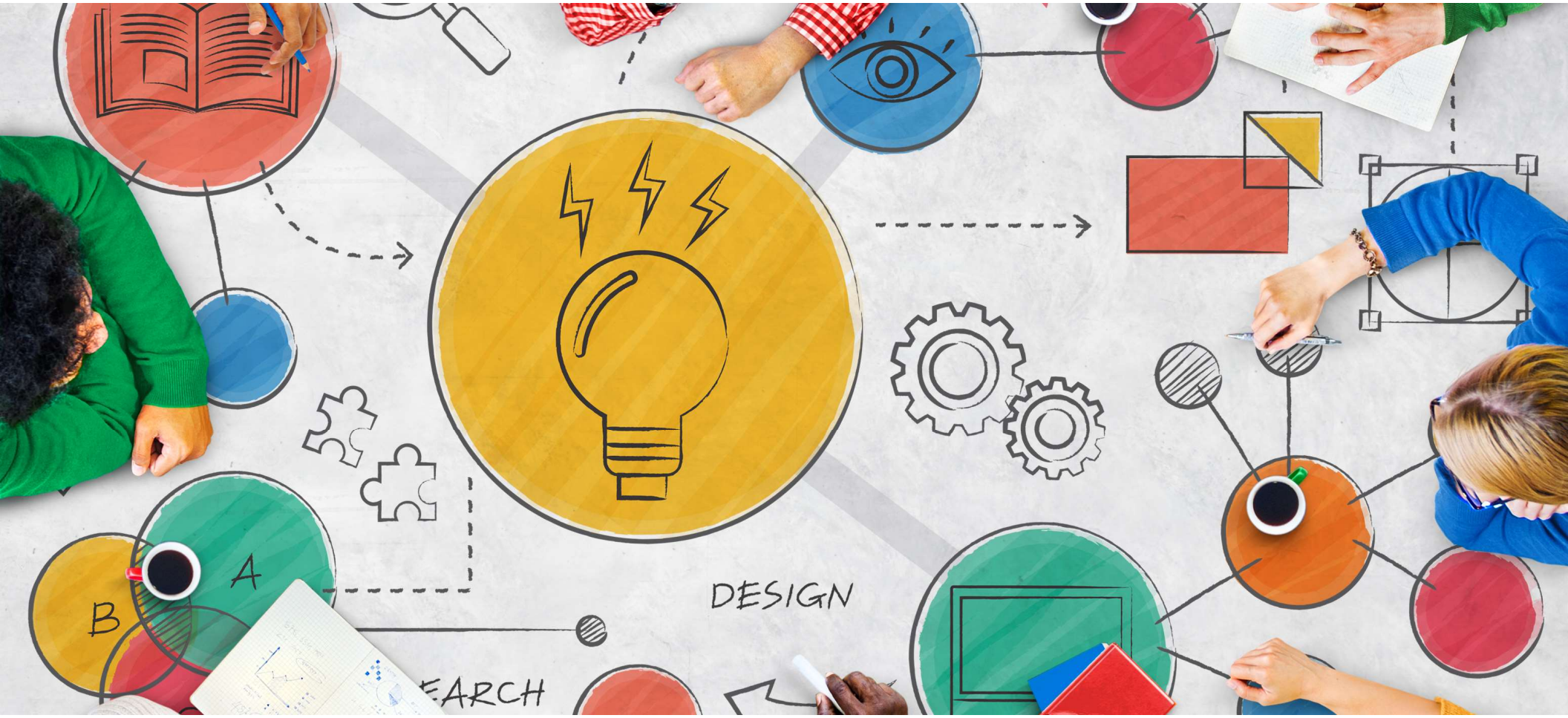
- **UNCTAD's Technology Assessment in African Countries**: UNCTAD has piloted **TA projects** in Seychelles, South Africa and Zambia, focusing on energy and agriculture. The assessments evaluated the impacts of a technology new to each country using a **new TA methodology** developed by UNCTAD for developing countries. It has been updated and is available for reference by other developing countries.

Challenges in TF and TA implementation



The adoption of Technology Assessment (TA) and Technology Foresight (TF) is widespread in developed countries, but significantly lower in developing countries located in Asia-Pacific, Latin America and the Caribbean, and lowest in Africa, where institutional frameworks and resources are lacking.

There is an urgent need for increased support to build TA/TF capacity in Africa to help the region address technological and societal challenges.



RECOMMENDATIONS

Recommendations for policy-makers

#1	Establish or Enhance TA/TF Centres	Initiate or strengthen dedicated **TA/TF centres** to scope projects that inform STI-related policy decisions. Proper scoping is critical to ensure the projects are aligned with national and regional priorities.
#2	Find Project Champions	**Identify champions** to advocate for the initiatives, ensuring cross-government collaboration and effective implementation of TA/TF results.
#3	Ensure Independence of TA/TF Teams	Maintain **independence to prevent bias** in assessments, ensuring TA/TF does not simply reinforce existing policies but provides objective insights.
#4	Localize TA/TF Processes	Adapt TA/TF to **national and sub-national contexts** to ensure relevance and effectiveness in addressing local challenges.
#5	Foster Cross-Sectoral Collaboration	**Break down silos** between ministries by promoting cross-sectoral TA/TF activities to address complex, overlapping issues in science and technology.
#6	Promote Regional and International Collaboration	**Explore collaborations** across national and regional borders to pool resources and address shared challenges effectively.

Recommendations for practitioners

#1	Ensure Methodological Diversity	Utilize a mix of **data-driven forecasting** and **creative approaches** (e.g., role-playing, brainstorming), combining **quantitative** and **qualitative** methods for robust assessments.
#2	Build Local Expertise	Engage local institutions and provide training to develop **TA/TF capabilities**, embedding knowledge transfer to support long-term local capacity.
#3	Address Social Inequalities	Ensure sensitivity to **gender, ethnicity, and social factors** in the assessment process to promote equitable and inclusive outcomes.
#4	Promote Futures Literacy and Set Realistic Expectations	Highlight **the value of foresight in navigating potential futures**, rather than predicting them, to ensure realistic expectations and support for long-term strategic planning.
#5	Engage with policymakers	**Involve the immediate client** in shaping policy impact by keeping policymakers informed about project progress and engaging them.

Recommendations for international cooperation

#1	Mobilize Resources and Promote Best Practices	Focus on identifying and mobilizing resources for TF/TA exercises and help countries leverage **successful TA/TF models.**
#2	Develop International Standards and Tools	Establish **common methodological standards for TA/TF at the international level**. This would enable consistent comparisons across countries and promote the use of shared tools to address global technological challenges.
#3	Build National Capabilities for Autonomy	Build **national capabilities** in countries to conduct TA/TF projects independently, reducing reliance on external expertise. This ensures sustainable and long-term capacity for innovation and policy formulation.
#4	Establish a Global TA/TF Support Mechanism	Create a global framework to provide **technical assistance**, **funding**, and **knowledge-sharing** for countries developing TA/TF capabilities
#5	Harness the CSTD's role	Harness the CSTD's role as a forum for **strategic planning**, sharing lessons learned and best practices in TA/TF exercises.

Conclusion

- **TA/TF: Not Cheap or Easy, but Critical:** While costly and complex, TA and TF are vital for shaping technology choices and driving sustainable innovation over the long term.
- **Addressing Grand Challenges:** TA/TF can help tackle global issues like clean energy and the circular economy, aligning STI with SDGs through strategic planning.
- **Both TA and TF are Crucial:** TA focuses mainly on immediate and mid-term evaluations, while TF explores long-term futures. Countries should develop capabilities in both for **a well-rounded approach to strategic planning**.

Thank you

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