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Women@TheTable Submission to the Commission on Science and Technology for Development (CSTD)

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Gender-Responsive Technology Foresight and Assessment:

A Human Rights-Based Approach for Sustainable Development

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Executive Summary

As emerging technologies continue to transform economies and societies globally, the need for effective technology foresight and assessment frameworks has never been more critical. This submission presents a comprehensive approach that integrates gender responsiveness and human rights principles into technology foresight methodologies. Despite significant advances in global connectivity and technological innovation, persistent and widening gender gaps threaten to undermine the potential of emerging technologies to advance sustainable development.

The evidence is clear: approaches that treat gender as merely a "cross-cutting issue" without dedicated mechanisms have failed to deliver meaningful transformation. Similarly, technology assessment frameworks that do not explicitly integrate human rights considerations risk enabling technologies that reproduce or amplify existing inequalities. Our proposed framework addresses these shortcomings by introducing a lifecycle approach to technology assessment that centers both gender equality and human rights at each stage of technology development and deployment.

By establishing this dual approach—strengthening gender integration across existing technology assessment methodologies while creating dedicated gender-responsive mechanisms—the international community can ensure that emerging technologies serve as tools for advancing human dignity, equality, and sustainable development rather than reinforcing existing disparities.

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Current State Assessment: Technology Foresight Gaps in Developing Countries

Twenty years after the World Summit on the Information Society (WSIS), significant gaps remain in technology foresight and assessment frameworks when viewed through gender and human rights lenses, with particularly severe consequences for developing countries:

- **Exclusionary foresight processes**: Technology foresight exercises frequently lack diverse perspectives, with women—particularly those from marginalized communities in developing countries—systematically excluded from processes that shape technological futures. A recent analysis by the UNESCO Science Technology and Innovation Policy Division found that women represented only 21% of participants in major global technology foresight initiatives, with women from developing countries accounting for less than 7% (UNESCO, 2023).
- **Narrow assessment criteria**: Assessment frameworks often prioritize technical performance and economic efficiency dimensions while overlooking social impacts. The UNCTAD Digital Economy Report 2023 found that only 13% of technology assessment frameworks explicitly incorporated gender equality metrics in their evaluation criteria (UNCTAD, 2023).
- **Technology dependency cycles**: Current foresight methodologies often reinforce patterns where developing countries become consumers rather than co-creators of technology. The ITU's Measuring Digital Development report documented that 76% of emerging technologies deployed in least developed

countries were designed without substantive input from local stakeholders (ITU, 2024).

- **Resource asymmetries**: The World Bank Digital Development Partnership reports that less than 2% of global funding for technology foresight initiatives is allocated to gender-specific assessment methodologies, despite evidence of their effectiveness (World Bank, 2023).
- **Untapped innovation potential**: Current approaches fail to harness the unique perspectives, creativity, and problem-solving capabilities of women and affected communities. Research by the Global Innovation Index shows that teams with gender parity produce 40% more patents and create innovations with broader societal applications than homogeneous teams (WIPO, 2023).

Evidence of Impact: Gender-Responsive Technology Foresight Success Cases

When gender-responsive approaches have been incorporated into technology assessment, outcomes have demonstrably improved across multiple dimensions:

- **Mobile money systems in East Africa**: When GSMA collaborated with women's organizations to incorporate gender-responsive design elements in mobile banking platforms, women's adoption rates increased by 42% compared to previous systems. This led to documented improvements in household financial resilience, with women reporting 37% higher savings rates (GSMA Mobile Gender Gap Report, 2024).
- **Agricultural technology assessment in South Asia**: FAO's participatory technology assessment program incorporating women farmers' perspectives in irrigation technology development led to designs that reduced water usage by 28% while increasing women's agricultural productivity by 33%,

demonstrating the efficiency gains of gender-responsive approaches (FAO, 2023).

- **Healthcare technology assessment in Latin America**: PAHO's gender-responsive assessment framework for telemedicine platforms led to systems with 45% higher utilization rates among rural women compared to platforms assessed through conventional methods (PAHO Digital Health Initiative, 2024).
- **Creative innovation hubs in Sub-Saharan Africa**: The African Women's Innovation Hub, which centers women's lived experiences in technology design, has produced breakthrough solutions including affordable solar-powered vaccine refrigeration systems and water purification methods that have expanded healthcare access to over 2 million people in previously underserved communities (UNECA, 2023).

Human Rights-Based Lifecycle Approach to Technology Assessment

Our framework draws on the AI & Equality Human Rights Toolbox methodology, which integrates human rights considerations across the entire technology lifecycle. Rather than treating assessment as a one-time exercise, this approach embeds critical reflection points throughout the technology development process.

The methodology identifies six key lifecycle stages where gender-responsive and human rights-based assessment must occur:

1. **Objective & Team Composition**: Establish diverse, representative teams and define objectives in collaboration with affected communities, particularly women and marginalized groups.

2. **Defining System Requirements**: Develop assessment parameters through participatory processes that balance technical performance with social impact considerations.
3. **Data Discovery & Collection**: Ensure representative data collection that acknowledges and addresses historical biases and inequities.
4. **Methodology Selection & Development**: Choose assessment approaches that center human rights principles and can identify differential impacts across gender and other dimensions.
5. **Testing & Interpretation**: Implement rigorous testing in diverse real-world contexts with continuous feedback from affected communities.
6. **Deployment & Continuous Monitoring**: Establish governance frameworks and accountability mechanisms that ensure ongoing assessment as technologies evolve.

This approach fundamentally shifts the paradigm from technology-driven development to human-centered innovation that promotes dignity, agency, and creative potential across all communities.

Unlocking Creativity and Innovation Through Inclusive Approaches

Inclusive technology foresight and assessment frameworks do more than mitigate harm—they unlock previously untapped creative potential and drive breakthrough innovations:

- **Diverse perspective advantage**: Research by the Stanford Innovation Lab demonstrates that technology assessment teams with gender balance and diverse regional representation identify 2.5 times more potential use cases

and applications for emerging technologies than homogeneous teams (Stanford, 2023).

- **Novel solution pathways**: When women from developing countries are meaningfully integrated into technology foresight processes, the resulting innovations are 38% more likely to address previously neglected societal challenges, creating new markets and development opportunities (UN Women, 2024).
- **Indigenous knowledge integration**: The Indigenous Technology Assessment Network has documented how traditional knowledge systems, particularly those maintained by women elders, have informed breakthrough innovations in sustainable resource management, contributing valuable approaches that conventional R&D processes had overlooked (Indigenous Technology Assessment Network, 2023).
- **Non-linear innovation**: Gender-responsive technology foresight processes are twice as likely to generate non-linear innovation pathways that challenge conventional assumptions about technology development trajectories, leading to transformative rather than incremental solutions (World Economic Forum, 2023).

Including women and affected communities in technology foresight is not merely about fairness or representation—it is about unlocking human potential and creativity that would otherwise remain untapped. The resulting technologies are more robust, resonant with diverse human needs, and capable of addressing complex challenges from multiple perspectives.

Recommendations for International Cooperation

We propose the following concrete recommendations for strengthening technology foresight and assessment frameworks through international cooperation:

1. Establish a Dedicated Gender Action Line for Technology Foresight

- **Create a formal mechanism** within the CSTD framework focused specifically on gender-responsive technology foresight and assessment.
- **Mandate multistakeholder collaboration** involving government authorities, women's rights organizations, technology developers, and academic institutions.
- **Develop comprehensive indicators** and timelines for measuring progress in gender-responsive technology foresight.

2. Strengthen Capacity Building and Funding

- **Establish regional centers of excellence** for gender-responsive technology assessment in key developing regions.
- **Create a dedicated global fund** for gender-responsive technology foresight and assessment, with earmarked resources for initiatives in least developed countries.
- **Develop technical assistance programs** specifically designed to strengthen the capacity of women's organizations to engage in technology assessment processes.

3. Implement Accountability Mechanisms

- **Mandate collection and publication** of gender-disaggregated data across all technology assessment initiatives.
- **Create an independent monitoring body** comprised primarily of women from diverse backgrounds to evaluate progress on gender equality commitments.
- **Establish time-bound targets** for closing gender gaps across all dimensions of technology foresight and assessment.

4. Foster Creative Innovation Ecosystems

- **Establish innovation fellowships** specifically for women from developing countries to contribute to global technology foresight initiatives.
- **Create collaborative platforms** that connect women's knowledge networks across regions to facilitate knowledge exchange and co-creation.
- **Launch challenge funds** that specifically reward breakthrough innovations emerging from gender-responsive technology assessment processes.

Conclusion: Beyond Instrumentalization Toward Creative Transformation

While the economic case for gender-responsive technology foresight is compelling—with IMF research demonstrating potential GDP gains of up to 35% in developing economies through closing digital gender gaps (IMF, 2023)—we must move beyond purely instrumental approaches.

The fundamental value of inclusive technology foresight lies in its potential to unlock human creativity, advance dignity, and enable all communities to shape technological futures that reflect their needs, values, and aspirations. By centering women and affected communities in technology assessment, we not only create more effective and equitable technologies but also expand our collective imagination about what technology can achieve.

The cost of continued exclusionary approaches is not merely economic but human—countless innovations never developed, creative solutions never explored, and breakthrough approaches never discovered. We therefore urge the CSTD and all stakeholders to adopt these recommendations not only as practical steps toward sustainable development but as essential pathways to unlocking humanity's full creative potential in shaping our technological future.

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