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**Key policy initiatives and capacity-building on gender
mainstreaming: focus on science and technology**

**MAINSTREAMING A GENDER PERSPECTIVE
IN SCIENCE, TECHNOLOGY AND
INNOVATION POLICY***

by

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*The views expressed in this paper are those of the author and do not necessarily represent those of the United Nations.

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I. Gender, science and technology on the international agenda

Gender equality is fundamental to achieving poverty reduction and socio-economic development: this results from the central and vital role that women play in society through their contribution to productive activities and their role as social educators and family caretakers. At the same time, gender equity in science and technology is important for development, as has long been recognised by the United Nations. Mainstreaming a gender perspective in Science, Technology and Innovation (STI) will hence both enhance social equity and bring significant benefits across the economic structure and social fabric, and contribute to the achievement of the Millennium Development Goals and the attainment of sustainable development.

More than 15 years ago, the Gender Working Group (GWG) of the United Nations Commission on Science and Technology for Development (CSTD) found that gender was the missing link in national science and technology programmes (Gender Working Group, 1995). The Working Group examined the differential impact of science and technology on the lives of men and women in developing countries, focusing on a number of sectors, including environment, health, energy, agriculture, education, information, employment, small-and-medium-sized enterprises and indigenous knowledge. It then made two important observations. *First*, serious obstacles existed which prevented girls and women from accessing science education and pursuing careers in science and technology. *Second*, technical change had benefited men more than women, largely because science and technology policies and programmes had not explicitly recognised the gender-specific nature of development. The Working Group recommended seven “Transformative Action Areas”, to support governments in their efforts to develop policy and programmes. These include:

1. Gender equity in science and technology education;
2. Removing obstacles to women in scientific and technological career;
3. Making science responsive to the needs of society;
4. Making the science and technology decision-making process more “gender aware”;
5. Relating better with “local knowledge systems”;
6. Addressing ethical issues in science and technology; and
7. Improving the collection of gender disaggregated data for policy makers¹.

These recommendations were adopted by ECOSOC in 1995. In addition, in 2006, the CSTD, through its Gender Advisory Board, iden

national development agenda among developing countries. There is renewed recognition among the international community that science, technology and innovation (STI) can be powerful tools to meet development goals, including those contained in the Millennium Declaration³. An increasing number of countries have partnered with international organizations to carry out reviews of their existing policies in STI. The United Nations Conference on Trade and

Women are responsible for crop production and food processing in most of the developing world, as well as dietary diversity and children's health. Worldwide, women are responsible for 60-90 per cent of food production activities. It is estimated for instance that up to 90 per cent of rice cultivation in Southeast Asia is performed by women while for basic foodstuffs in sub-Saharan Africa their input is about 80 per cent.

Women's agricultural activities tend to be under-reported, particularly in the developing world. They are usually recorded under household activities (e.g. household gardens) rather than agricultural production. Thus their contribution to agriculture tends to be poorly understood, and their agricultural activities are usually characterized by a lack of resources and support, including credit, agricultural inputs and technologies to increase production, as well as training (Meinzen-Dick et al, 2010). Additionally, HIV/AIDS forces women in many regions to neglect their food production activities to care for family members who are sick. This is a context where labour-reducing technologies would help increase food production.

The lack of rights of women to own land and other assets is an important agriculture and natural resource management issue. In spite of their substantial contribution to agricultural production, women are marginalized when it comes to land ownership and access to services. For example, less than 10 per cent of women farmers own land in a number of Asian countries, such as India, Nepal and Thailand (IAASTD, 2009). The percentage is even smaller in Africa where traditionally women in many countries are not allowed to own or inherit land. It has been estimated that agricultural production in sub-Saharan Africa could rise by 20 per cent if women had equal access to land, seed and fertilizer⁴. On the other hand, there is less incentive for women without land ownership to use conservation techniques to maintain it.

Particular attention should be paid to the technologies and techniques that can address the priority needs of rural women. Some of them include for instance: improved stoves, rainwater harvesting techniques and intermediate transport devices that reduce the time spent on collection of fuelwood and water.

unsafe water and unsanitary conditions, and it would fall on women to care for ailing members of their families. And yet, women are often excluded from water management decisions; their needs and uses are often not taken into account.

In most cultures, women and men have different roles and responsibilities in the use and management of water. Women use water for productive, consumptive and domestic purposes, including cooking, cleaning, health and hygiene, and growing food (if they have access to land). Men's water use priorities on

Working with women's knowledge, innovations, and concerns/interests and involving them in design and implementation will bring them into the research and development process to increase their effectiveness and production and add to the base of overall S&T knowledge.

What can be done?

There is a strong role for policies to support the design, development and diffusion of technologies that could contribute to improve the status of women as illustrated above in the agriculture, water or energy sectors. Policy choices and priorities need to take into account the gender factor. Applying a gender lens, through gender impact analysis, would contribute to designing and introducing gender-responsive policies. It is time to revisit this approach, suggested 15 years ago by the above-mentioned Gender Working Group of the United Nations Commission on Science and Technology, and to work on ways and means to operationalize and disseminate it.

Particular attention should also be paid to implementation, as the case of technology and know-how dissemination in the rural sector illustrates. As predominantly small farmers who tend to work with low input and rain-fed farming, enjoy fewer resources to invest in the formal technologies, and have multiple uses for a plot of land, women are often bypassed in the formal dissemination system (e.g. extension, technical assistance). In this regard, community-driven approaches to technology development can help Gender-Workshop-24-9-04-11-10-006-df-04-02-1c 0.19nTd[(d

In spite of the progress registered in gender parity in education, the participation of girls and women in STI education remains lower than that of males in all regions. In that respect, developing countries face a common set of challenges including in particular: cost, lack of family support, the school environment (e.g., lack of sanitation facilities), conflict, distance from school and lack of safe and reliable public transportation, lack of adequate teaching and learning material, cultural attitudes and practices, and counseling systems which do not necessarily take into account the specific needs of girls.

At present, there are imbalances between males and females at all levels of the science education system:

i) At the primary and secondary levels, even though girls and boys have the same access to coursework, they do not emerge with the same levels of understanding due to lack of life experiences and ability to participate actively in class (Malcom, 2010). Girls do not pursue science and technical studies at the same rate as boys, though the situation may vary depending on subject areas and countries. Bias in the teaching materials and the pedagogy tends to discourage girls and erode their self-confidence in S&T subjects (UNESCO, 2007). In addition, girls and boys experience differential access to technical and vocational education.

ii) At the tertiary level, science, engineering, and technology fields are predominantly male in the majority of countries, at every stage of higher education (Schiebinger, 2010). While women tend to be more highly represented in behavioural and life sciences, their representation in the other science-related subjects – maths, sciences, technology and engineering – is lower than that of men.

This is important because women in general, and men at lower income levels, tend to be concentrated in low or unskilled jobs and do not have the access to technical and skills training which will facilitate technical and cognitive employment in higher-skilled / higher-paid professions.

ICTs can support women's education and training

It has been recognized that ICTs can provide avenues to training and knowledge. They

strategies, including the national STI policies. The primary features of a gender-affirmative policy are: coherence, confirmation by evidence, integration into policy-making, and provisions for scaling up of successful programmes.

i) Coherence: Approaches to STI policy formulation, that used to be centered on evolving scientific and technological research, are moving towards a broader notion of the use of S&T more closely linked with other policy areas. Policy harmonization around gender equality is beginning to emerge in some countries. The Government of the United Republic of Tanzania, for example, is integrating gender equality into institutional and reform processes in key sectors and programmes, such as civil service reform, education, health, water, and agriculture sectors as well as the national AIDS prevention program. It has identified gender equality as a key target of its national development program.

Another model for integrating gender into multi-sectoral policies is the European Charter for Equality of Women and Men in Local Life of the Council of European Municipalities and Regions which encourages local and regional governments to formally commit to actions promoting gender equity and take into consideration gender concerns when dealing with issues such as infrastructure, transportation, and energy for instance.

ii) Evidence-based approach : Regardless of the approaches, policy making should be evidence-based and informed by rigorous gender-sensitive research. It has been found, for example in research on the adoption of agricultural biotechnology by men and women, that traits of interest to poor farmers are being neglected, and furthermore, agricultural R&D tends to exclude non-cash crops and vegetables, such as those grown by women for household use. Such neglect applies also to techniques and tools which could ease women's work. An evidence-based policy would draw on these findings to include crops, tools and techniques that would improve family nutrition, raise income levels and enhance quality of life. Evidence-based policy would require reliable information; gender impact analyses; competent professionals; and measures to disseminate findings, particularly into the governmental decision-making mechanism.

iii) Integration into STI policy making and good practice examples: gender mainstreaming into STI policy design and implementation (including data collection) and decision-making is key to empower women and optimize their contribution to development.

science. The South African policy platform is interlinked with other policies that also have gender equality components as well as with the widespread national gender machinery⁹.

Another example is the European Commission's Strategy for equality between women and men (2010-2015) which highlights the connections between gender equality, economic growth and sustainable development, and supports through a number of concrete actions integration of gender equality dimensions in the Europe 2020 Strategy.

iv) **Scaling up:** Policy initiatives do not need to be "top-down". There are initiatives wherein grassroots participants are 'partners' rather than 'targets' whose enhanced capacities would ensure the sustainability and growth when the project phase is completed. One example is the South African-based NGO ProLinnova, a global learning network built on farmer-led approaches to ecologically-oriented agriculture and natural resources management. Some organizations also work to complement their action at the community level with advocacy to influence relevant policies and programs at national, regional and global levels¹⁰, or to spread their projects or the lessons learnt to the regional or national level. What matters in all cases is that experience at the local level is fed into national policy and programming.

IV Conclusion

In order to achieve sustainable development and to meet the Millennium Development Goals, governments - and the world community at large - must find the right mix of policies and measures to fully reap the promises of a science-based, technology and innovation-driven knowledge society. This includes STI policies that empower and support both women and men in sustainable development: indeed, while economic progress can improve the status of women, a country cannot advance when women are left behind. Ensuring women's role in S&T (women IN science) and developing and implementing S&T approaches which benefit women (science FOR women) involves consulting and working with women in the choice, development and application of technologies; providing them access to resources; ensuring their contribution to and benefit from S&T innovations; recognizing and supporting their local knowledge and innovative practices.

The main strategy in this context requires gender mainstreaming throughout the whole process of STI policy making. It calls for an understanding of gender differences in terms of access to resources and opportunities, a recognition of the abilities and innovative capacities at the grassroots level, and building capacities of people to assess, create and implement solutions. It involves applying the gender lens in each phase of the policy making process, and in particular:

- 1) At the *research* level, evidence-based assessments of problems and challenges that take into account gender equality, and gendered gaps in design and implementation of

⁹ Ibid.

¹⁰ See for instance the NGO Practical Action's work on sanitary infrastructure which highlights that "while small scale interventions are important, it is equally important to influence the mechanism at the national and global levels, particularly the decisions to finance and provide environmental health infrastructure and services in large numbers" (<http://practicalaction.org/water-and-sanitation/sanitation>), and UNCTAD 2011.

STI policies and strategies;

2) At the *design* level, problem-based solutions and strategies elaborated in consultation with women at all levels;

3) At the *implementation and monitoring* level, programs and support structures to implement gender-responsive STI policy, such as credit and financing, scaling up, and expert advisory support. Also needed are capacity-building in supporting institutions through partnerships, consultation and training with and for women to ensure the development of new or enhanced local-scale technologies which are appropriate to conditions, users, and problems.

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