United Nations Commission on the Status of Women
Fifty-fifth session
22 February – 4 March 2011
New York

INTERACTIVE EXPERT PANEL

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

ANNE MIROUX
Director
Division on Technology and Logistics, UNCTAD

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 makers[1].

These recommendations were adopted by ECOSOC in 1995. In addition, in 2006, the CSTD, through its Gender Advisory Board, identified a new action area, namely, "Equal opportunity for entry and advancement into larger-scale science, technology, engineering, and mathematics (STEM) and innovation systems"[2].

Fifteen years later, it is particularly pertinent to revisit these recommendations at the Commission on the Status of Women, as we are confronted with some of the most daunting challenges to humanity, in areas such as agriculture, energy and climate change.

The timing indeed is opportune: after decades of relative neglect in many developing countries, there is some evidence that science and technology (S&T) is gaining prominence in

---

[1] Transformation Actions as identified in the Report of the Gender Working Group, UN Commission on Science and Technology for Development, *Missing Links: Gender Equity in Science and Technology for Development* , 1995
[2] http://gab.wigsat.org

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 Development (UNCTAD), for instance, has undertaken such reviews for a number of developing countries in recent years.

Unfortunately, very few national policies in industry, science and technology, and information and communication technologies (ICTs) address gender equality. This gap is often caused by a lack of understanding of 1) the role of women in social and economic development, 2) the role of S&T in addressing challenges faced by women in fulfilling their roles as food producers, social educators, caregivers for their families and community managers, and 3) the real and potential contribution of women to research, development and innovation. This paper examines the importance of making STI policies gender-responsive for growth and development and explore ways and means to achieve this.

II. Making STI policy gender-responsive

This area is not without signs of encouragement: over the course of the past 15 years, a number of national and regional initiatives have emerged to incorporate women's needs and perspectives into STI policies. From their experiences, as well as the landmark work of the GWG of CSTD, we have learnt that the following three elements are key to effective STI policies:

1. Promoting and leveraging S&T to support women's development ("**Science for Women**")
2. Promoting gender equality in science, technology and engineering education, workforce and leadership ("**Women in Science**")
3. Encouraging and supporting the role of women in innovation systems at national and grassroots levels.

I will address these in turn.

A. Promoting and leveraging S&T to support women's development: Science for Women

As we all know, women play a central role in all the main sectors that particularly affect human wellbeing, namely, food production and agriculture; water and sanitation; energy; and conservation of biodiversity. Appropriate gender-responsive policies targeting in particular these sectors would help support women's development and optimize their contribution to growth and sustainable development as illustrated below.

Food security, agriculture and nutrition

---

3 See for instance Juma and Lee, 2005.

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 fertilizer[4]. 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; improved hoes, planters and grinding mills to increase productivity and reduce energy expenditure; improved farming techniques to reduce the time needed for labour-intensive tasks; and food-processing technologies that will increase their incomes with less time and energy expended (Carr and Hartl, IFAD 2010).

Beyond technology and techniques, extension services are also essential in the agricultural innovation systems. In many countries extension is focused on cash crops, either for export or for national self-sufficiency. Therefore they tend to either overlook women, who are more commonly involved in food production for the family or communities than in cash crop production, or to be of little practical use for women's agricultural practices (eg. garden vegetables). Addressing these issues will require that extension approaches and agents take into account gender roles in households, society, agriculture and rural development more generally.

Water

Women and girls walk long distances for water. About two-third of the world's water-deprived are said to be women, who also have responsibility for sanitation and hygiene in the household (IFAD, 2007). It is estimated that 80 per cent of illnesses could be attributed to

---

[4] Wakhungu, 2010. See also IFPRI 2005 for estimates on Burkina Faso and Kenya. .

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 the other hand, mainly revolve around agriculture or livestock. Most water initiatives aimed at poor and vulnerable farmers often do not engage women with regard to location, technology choice or training, and therefore often fail to take into account women's concerns about the multiple uses of water, causing negative effects for community and household water use.

In as much as it is generally women who have responsibility for sanitation and hygiene in the household, they should be given expanded roles in water management. There are, for instance, simple technologies and innovations that might be scaled up. One such practice is drip-irrigation, which is successfully used in vegetable production by women in Nepal. In addition to higher yields, this innovation has led to enhanced status and self-confidence, which resulted in better exercise of their decision-making prerogatives. In other words, it is an innovation that led to empowerment.

Energy
Rural energy is another example of a sector where STI can make an impact as women's priorities and tasks have tended to be overlooked in favour of larger-scale technologies. For instance, about 40 per cent of the world population still uses biomass for cooking. The use of biomass and traditional forms of energy has serious negative implications for health, economic development and the environment. Women have higher levels of lung and eye diseases from exposure to smoke and particulates in the household, for instance. In addition, women and girls spend an inordinate amount of time each day fetching fuelwood - time that cannot be used for other livelihood activities. Walking long distances with fuel, beside the detrimental impact it can have on health, keeps girls away from school. While women tend to have responsibility for the household's energy provision, they tend not to be involved in decision making around energy.

Access to modern energy services could liberate women and girls from household tasks, provide safe environment to work and study, as well as open opportunities for income-generating activities: it is hence a development as well as a gender issue. In Bangladesh and India, for instance, bottom-up programmes are underway to train rural women as solar energy technicians[5]. In Eritrea, improved cookstoves use waste biomass for fuel, such as twigs, leaves and animal waste, relieving pressure on fuelwood resources. The stoves are also designed to reduce hazardous effects, such as injuries and burns. Classes have been held in local communities to explain the use of the technology, and women are being hired to train other women in the stove-building technique (CSTD, 2010). These examples show that projects are more likely to succeed if they engage women, address their needs and build on their knowledge and skills.

---

5 In India for instance, the Barefoot College trains rural women to build, install and use solar panels.

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 women and small farmers benefit through improved crop diversification and new farming technologies that both cut down on unproductive time and increase yields.

In addition to encouraging more female extension workers, the training of extension workers should be expanded to allow them to provide advice on a multiplicity of crops, animals and agricultural alternatives. As well, training–of-trainer and community development skills should be developed so that extension workers can better understand how to invite farmer participation, especially that of women, and collaborate with them to develop technology inputs better adapted to their needs.

B. Promoting gender equality in science, technology and engineering education, workforce and leadership: Women in Science.

Through their participation in science, technology and engineering education, workforce and leadership, women can contribute to shaping the STI agenda to make it more gender-responsive. Key issues in this respect include the role of science education in promoting a scientific and technologically literate population (including women and girls), the role that scientists and technologists can play in working with women at the grassroots to improve their production and support their enterprises, and ensuring that women gain expertise, and credentials to participate in shaping the STI agenda, including as leaders and decision makers.

Indeed, optimizing women's participation in STI is not just a case of civic obligation for equality of all citizens; it is actually a case of shrewd management and good governance. A gender-balanced workforce has the benefit of a wider and enriching range of perspectives, which lends to more innovative problem-solving and decision-making capacities.

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. An alarming global phenomenon is the "leaking pipeline", a term used to denote the phenomenon of qualified women dropping out instead of moving up the career ladder. For example, in India women earned 32 per cent of all first-level degrees and 20 per cent of all third-level degrees in physics, but made up only 11 per cent of professionally- employed physicists.

What can be done?

A number of policies and measures have been developed, with the objective of attracting and retaining women in S&T, including in developing countries. For instance, while science, maths and technology (SMT) education in Africa is confronted by challenges of participation, equity, resources and expertise, a number of African States have developed national policies on SMT education. These policies aim, inter alia, at demystifying science and technology, promoting female SMT education, and building science and technology institutional and human capacity.

Continuing education and technical training

Lifelong learning and vocational educational strategies are important to those women and men who need additional skills and training outside the formal education system. These educational options can allow students to overcome the disadvantages of lower educational and literacy levels and to gain skills and knowledge that are specific to their goals and livelihoods.

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 can facilitate education and training for groups at all income levels and in both rural and urban settings. They can be a means for women and girls to overcome educational barriers to training and knowledge. ICTs provide flexibility of access and study times and the potential to reach women in rural areas: as such they can be very helpful in educating women who would not have access to more traditional forms of education (Kramarae 2001). Online courses tend also to be more affordable as they entail none of the travel, boarding and other related costs of higher education. A study in Barbados found, for instance, that participation in distance learning can inspire women to become more interested in and feel more confident about enrolling in S&T courses (Commonwealth of Learning 1999).

Fixing the "leaking pipeline"

Ignoring the leaking pipeline would be a significant mistake in economic terms, not to mention the social costs of unrealized potentials. Studies have shown that women's representation and advancement in the STEM fields are affected by factors external to their ability, interest and technical skills, such as organizational constraints of academic institutions, differential effects of work and family demands, implicit and explicit bias, and under-representation of women in academic leadership and decision-making positions.

Some of the many initiatives to break the glass ceiling and fix the leak are the ADVANCE program of the National Science Foundation (USA) and L'Oreal's Women in Science Program. The impact of such programs, when coupled with political will, could be game-changing as in the case of the Brazilian Agricultural Research Corporation (EMBRAPA), where the proportion of women researchers more than doubled from 1980 to about 27 per cent in 2005 as a result of gender-targeted education measures to increase women's enrollment and completion of university science courses, and of EMBRAPA's proactive but non-discriminatory recruitment policies. Women scientists themselves have been networking and organizing themselves, the Organization for Women in Science for the Developing World (OWSDW) [formerly Third World Organization for Women in Science (TWOWS)] being the largest organization with a membership of 2000+ individuals and 30+ institutions from 102 developing countries.

C. Supporting women in innovation systems

A key entry point for women into innovation systems in most developing countries is through private enterprise, both formal and informal. The under-representation of women at the top levels of the business sector is also believed to make for weak national innovation systems and less competitiveness in the global innovation system. For women - farmers, small-scale

producers, managers and executives - the key obstacles are basically the same: lack of access to technical and scientific education and training, lack of access to venture capital; lack of recognition of and protection of women's knowledge and innovations; and lack of training of women for enterprise development (Huyer and Hafkin, 2007). Notwithstanding these obstacles, women-led innovations abound and represent a significant potential source of competitiveness for countries to tap into. The challenge for policy-makers is to build a framework wherein potentials for innovation - including those of women - can be brought to full fruition.

In a globalized economy, small and medium enterprises (SMEs) need to be supported to enter regional and global value chains connecting local, national, regional and international markets. The access to resources and benefits that women's SMEs enjoy will impact their ability to compete successfully at national, regional and international levels and produce the goods expected by large international buyers. The role for STI here involves technology support in production and quality processes, and enterprise support in the form of training, access to markets and business advice (CSW, 2010).

Supporting women's small-scale enterprises is essential for a flourishing national innovation system. That being said, women's representation in large-scale innovation systems should not be overlooked. Few international bodies have recognized the importance of this issue. As noted by the Gender Advisory Board of the CSTD, having women in management and leadership positions, and managing medium and large-scale enterprises, are "important factors for national innovation systems and the ability of countries to compete in global innovation systems".[6] As a result, as stated in the above mentioned Transformation Action Area 8 that was identified by the Gender Advisory Board of the United Nations Commission on Science and Technology in 2006, "Steps should be taken to encourage women's participation in innovation systems through their own enterprises as well as active engagement in innovative industries (including ICTs and advanced networks) at senior levels. Such steps include promotion and facilitation of women's inventions, protection of women's intellectual property, and access to capital for industrial/entrepreneurial development, from the level of micro-credit all the way to venture capital".[7]

II. Models for integrating a gender perspective into STI policies

There is no "one-size-fits-all" magic formula for integrating a gender perspective into STI policies. An examination of some of the successful experiences has demonstrated the importance of some common crucial elements, i.e.:
 1) integrating gender dimensions of both men and women throughout the different stages of policy-making;
 2) addressing institutional capacity-building needs; and
 3) monitoring continuously to assess gender impact. Policies without institutional capacity and strategies for implementation and monitoring will remain statements.

The challenge for policy-makers is to assess and understand the gender factor of their human capital, and to build this knowledge into the design of their national development

---

[6] http://gab.wigsat.org. Transformation Action Area 8
[7] Ibid

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.

A range of STI policies, policy tools, and measures are emerging at the national level. They focus either on a selected set of issues and goals, or take on a range of interlinking strategies to promote harmonization of results in related sectors. Brazil, China, Ghana, India, the Republic of Korea, the Philippines, Rwanda, and South Africa, are just a few countries which have developed policies to more effectively integrate women and gender into national STI systems[8]. In the case of South Africa, for instance, its Research and Development Strategy (2002) includes as one of its objectives to "increase the number of women and people from previously disadvantaged communities entering the sciences and remaining there." The implementation of this objective is overseen by a committee in the National Advisory Council on Innovation (NACI), made up of stakeholders with interest in STI and the progress of women in

---

[8] See UNCTAD, 2011.

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 machinery[9].

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 levels[10], 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.

References

ActionAid, 2010. Fertile ground: How governments and donors can halve hunger by supporting small farmers. London: ActionAid.

Carr, M. and Hartl M. , 2010. *Lightening the Load: Labour saving technologies and practices for rural women*. Rugby, UK: International Fund for Agricultural Development and Practical Action.

Commonwealth of Learning, ed. 1999. Identifying barriers encountered by women in the use of information and communications technologies (ICTs) for open and distance learning in the Caribbean. *Summary Report of a workshop held in Bridgetown, Barbados.*

Commission on the Status of Women, 2010, *Report of the Secretary General*, E/CN.6/ 2011/3

Department of Economic and Social Affairs (DESA), 2010. *The World's Women 2010: Trends and Statistics*. New York: United Nations.

 FAO, 2010d. *Gender: Natural Resources*. [Webpage].
Available from: http://www.fao.org/gender/gender-home/gender-programme/gender-natural/en/

Gender Working Group, UN Commission on Science and Technology for Development, 1995. Taking Action: Conclusions and Recommendations of the Gender Working Group. In *Missing Links: Gender Equity in Science and Technology for Development*. Ottawa: IDRC.

Huyer, Sophia and Nancy Hafkin, 2007. *Engendering the Knowledge Society: Measuring Women's Participation*. Montreal: Orbicom.

IFAD, 2007. *Securing water for improved rural livelihoods: The multiple-uses system approach*. Rome: IFAD.

IFAD, 2010. *From lighter loads to better business: empowering rural women in Kenya*. Availablefrom:http://www.ruralpovertyportal.org/web/guest/country/voice/tags/kenya/kenya_rural women

IAASTD, 2009, International Assessment of Agricultural Knowledge, Science and Technology for Development, *Agriculture at a crossroad, Global Report*, Washington D.C: Island Press

IFPRI 2005, *Women: still the key to food and nutrition security*, Washington DC.

Kramarae, Cheris, 2001. *The third shift: Women learning online*. Washington, DC: AAUW Educational Foundation.

Juma, Calestous and Lee Yee-Cheuog, 2005, *Innnovation: Applying knowledge for development,* UN Millennium Project task Force on Science, technologè and Innovation, London: Earthcan.

Malcom, Shirley, 2010. How to Reach Out to Girls, Their Families and Communities to Support Involvement in Inquiry-Based Science. *In: Inquiry Based Science Education (IBSE) for girls, 11-13 May, Pretoria, South Africa.* ASSAf.

Meinzen-Dick, Ruth and Zwarteveen, Margreet, 1998. Gendered participation in water management: Issues and illustrations from water users' associations in South Asia. *Agriculture and Human Values,* 15 (4), p. 337-345.

Schiebinger, Londa, Gender, Science and Technology. *In: Background Paper prepared for the UN Expert Meeting on Gender, Science and Technology, September 28 - October 1, Paris.* 2010:.

UN Division for the Advancement of Women (UNDAW), ed. 2010. Gender, science and technology: Report of the expert group meeting. *Expert Group Meeting on Gender, Science and Technology,28 September – 1 October 2010, Paris.*

UNCTAD, 2002. Mainstreaming Gender to Promote Opportunities through the Increased Contribution of Women to Competitiveness. [Sixth Session Geneva]. *Note by the UNCTAD Secretariat. Commission on Enterprise, Business Facilitation and Development ,* February. Available from: www.unctad.org/en/docs//c3d44.en.pdf

UNCTAD, 2011 forthcoming, *Applying a Gender Lens to Science, Technology and Innovation.*

UNESCO, 2007. *Science, Technology, and Gender: An International Report.* Paris: UNESCO.

Wakhungu, Judi W. , 2010. Gender Dimensions of Science and Technology: African Women in Agriculture. [pdf]. *United Nations Commission for the Status of Women,* (Expert paper prepared for the Expert Group Meeting on Gender, Science and Technology), September 28 - October 1. Available from: http://www.un.org/womenwatch/daw/egm/gst_2010/index.html