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Gender Mainstreaming in Ministries and Departments Responsible for Science and Technology

The Complex and Cross-Cutting Nature of the Science and Technology Portfolio

Departments mandated to co-ordinate science and technology vary widely with respect to their portfolio of responsibilities. Commonly, a core activity is to ensure that the national science and technology infrastructure is supported and fostered, including human resource capacity building and technology transfer. Trade promotion and investment are often also part of the portfolio, including initiatives pertaining to Small and Medium-sized Enterprises (SMEs) and micro-enterprises.

Research laboratories and science-based policies and programmes also may be dispersed across several departments including Ministries of Energy and Natural Resources, Health, Environment, Agriculture and Industry. Frequently, agencies such as the Statistics Agency, Office of Intellectual Property, Centre of Disaster Management, Tourism Agency and National Advisory Board on Ethics report to the Minister of Industry, Science and Technology. The cross-cutting nature of the science and technology mandate requires that gender mainstreaming be promulgated through inter-departmental science committees as much as it is implemented in the lead Science and Technology Ministry.

The collection of sex-disaggregated data is an important starting point in identifying the gender gap in science disciplines and in positions of decision-making. Historically, governments have initiated their response to the gender gap in science and technology by introducing strategies to fill the science and technology 'supply pipeline'. Initiatives to attract and retain women in science have aimed to increase the numbers rather than investigate the rationale for why women are absent in the first place (or how science might change with increasing numbers of women defining the research agenda). Agendas for action to enhance the numbers of women in science can draw upon the policy recommendations of the Beijing World Conference, the UNCSTD Gender Working Group and UNESCO.

These strategies to increase the numbers, however, represent an important but only initial stepping stone to gender mainstreaming. To help ensure a strong science policy that is serving society equitably and is sustainable for future generations, science and technology decision-makers have at their disposition the powerful tool of gender-based analysis (GBA). The systematic introduction of such an impact analysis filter across federal departments is not new. Since the United Nations Conference on the Environment and Development (UNCED) in the early 1990s, most governments have introduced mandatory environmental impact assessment protocols for all publicly-funded policies and programmes. Similarly, the systematic application of GBA permits science and technology decision-makers to see the differential impacts of their proposals on all sectors of society prior to implementation. Such an 'early-alert system'

will aid decision-makers in ameliorating unexpected or unintended outcomes of science research and projects on vulnerable populations within society that might have otherwise have been overlooked.

Two further dimensions of science and technology policy will become apparent when gender aware practices are required. First, attention will be paid to the valuable contributions made by women's local and indigenous knowledge systems and innovations to western science systems. In a related fashion, intellectual property (IP) offices will become aware of the need to handle community-based knowledge generated over decades differently to individual applications for protection of IP. Secondly, as the ethical implications of research are examined, gender analysis will reveal to decision-makers diverse perspectives and value systems in society.

Governments can be supported strongly in achieving their goal of gender equality by tapping into the rich variety of networks of non-governmental organisations (NGOs) and the flourishing number of websites highlighting the new emergence of women in technology and feminist bioethics (see Chapter 6).

Practical Steps to Mainstream Gender at Multiple Levels

In order to bring women's concerns into the science and technology mainstream and identify gender bias and inequity, it is necessary to operate at several different levels:

1. introducing the systematic use of gender-based analysis for all policies and programmes;
2. establishing gender units in Science and Technology Ministries and science and technology experts inside the national women's machinery (NWM);
3. diffusing responsibility for gender integration beyond focal points and gender units through department-wide gender training and gender guidelines to make gender analysis a routine undertaking by all bureaucratic units and staff members and one that is identified and rewarded in job performance evaluations;
4. setting up an enforcement mechanism for monitoring through a central agency such as the Auditor General.

High-level enforcement sends strong signals throughout the system that gender equity is a priority of political leaders. In some countries, for example, the environmental impact assessment tool mentioned above is monitored by the office of the Auditor General. Ensuring the systematic incorporation of GBA across science departments requires no less corporate commitment. Gender mainstreaming in the machinery of government departments is underpinned by international commitments of governments to gender equity and serves to translate this obligation into action at the level of federal science and technology machinery.

Guidelines and Roadposts

When a gendered perspective is not explicitly and systematically used to inform policy analysis, the analysis will be gender-blind, meaning it is implicitly premised on the notion of a male reality. While often couched in apparently gender-neutral language, it is actually male-biased in that it privileges male needs, interests and priorities in the distribution of opportunities and resources. The following guidelines are therefore suggested to ensure that a gender perspective is brought to bear:

♦ ***Identify problems, issues, and objectives of the policy initiative***

How a problem or issue is defined is not neutral, but will reflect the biases and

assumptions of those who define it. Therefore, the definition of the problem or issue may need to be dynamic, and modified during the research, so that recommendations made will address the real and not the perceived issue. As the problem or issue is re-defined, so the objectives will also change. Does the definition of the problem reflect women's and men's reality and experience? What steps were taken (i.e. who was consulted) to better form a gendered perspective on this issue? Does the explanation of the problem take into account the immediate, underlying and structural/systemic roots of the problem or issue? Have objectives been defined to address each of these causes? Are the objectives generic or gender-specific?

♦ ***Define desired/anticipated outcomes, indicators***

Is the policy intended to be: (i) gender-neutral (i.e. differential impacts are avoided by revising policies so that men and women benefit equally); (ii) gender-specific (i.e. intended to target either women or men specifically to achieve policy goals); or (iii) gender-transformative (i.e. seeking to transform gender relations and identities, a long-term goal with much deeper social and cultural impacts, leading to a more egalitarian society)? Is the intention to integrate gender into pre-existing policy concerns (i.e. highlighting the gender dimension within current policy preoccupations), or to transform mainstream policy agendas from a gender perspective (i.e. evaluating and re-orienting not just the policies, but the institutions that create them and their norms, rules, priorities and goals from a gender perspective?) How will these outcomes be measured? What will indicate to policy evaluators that the desired outcomes have been achieved?

♦ ***Conduct inclusive research***

Sex-disaggregated statistics are essential but cannot be considered the end result of research. Instead, statistics should be the basis for research questions, so that assumptions as to the underlying causes of or trends in the statistics can be investigated and, if necessary, disproved, and the reality of the situation can be revealed. Consultation strategies which are inclusive, dynamic and open are essential. The selection of representatives of social groups should reflect the true diversity of people affected by the policy, avoiding stereotyping or aggregating of groups, so that all voices have an equal chance of being heard. This will likely require scheduling consultations during times and in places which are more convenient for certain groups. Where topics may be sensitive or taboo for women to discuss with men, female researchers should be utilised.

♦ ***Learn from the process***

Questions should also be asked about what has been learned through this analysis. How does it apply to government policy development? What was learned by using a gendered approach which would otherwise have been ignored? What assumptions and stereotypes were revealed, questioned or disproved? What value has been added to the analysis by taking a gender perspective?

♦ ***Set targets***

What have the research results shown must be addressed in order to counter the problem or issue? What can be realistically achieved in the short term? In the long-term? These possibilities will be the targets of the policy or programme.

♦ ***Develop options for recommendations and prioritise them***

What are the possible policy or programme options which could achieve these targets? Can these potential policy options be prioritised? Criteria can be established which reflect the objectives of the policy and can be used to compare the different recommendations developed using gender analysis. Examples of criteria could be: How well does it address the equity objectives? Will opportunities and choices for women be improved? Will systemic causes of the problem be addressed or only the immediate

causes? These criteria can then be used to rank the various options as to how well they can be expected to achieve the objectives and targets set out during the analysis.

♦ **Communicate the recommendations**

Has the support and commitment of key decision makers been obtained? A communication strategy may be required in order to create an awareness of the benefits of gender mainstreaming and the policy recommendations, which will in turn produce the support and commitment needed to, firstly, implement the recommendations and, secondly, institutionalise a gender perspective.

Developing an Action Plan

The process of gender mainstreaming can be broken down into four phases:

- ♦ Raising awareness
- ♦ Process of legitimisation
- ♦ Implementation and institutionalisation
- ♦ Monitoring and evaluation

Phase 1: Raising Awareness

The profile of the issue must be raised both externally and internally, and the benefits of gender sensitive policy must be clearly demonstrable.

Externally: International fora that have addressed gender equity have resulted in Declarations, Platforms for Action, Statements of Intent and Conventions endorsed by states. Progress reports by governments to international bodies, such as the United Nations and the Commonwealth Secretariat, must be published to highlight progress and best practices. Civil society needs to be engaged in this process. NGOs, public interest groups and the press can provide supporting research and raise awareness of progress and obstacles in closing the gender gap.

Internally: The benefits of gender-sensitive policy must be clearly demonstrable. Removing gender bias in science policy and ensuring that science serves society in an equitable manner must become synonymous with sustainable strategies. Up-to-date, high quality statistics and studies which clearly spell out the need for government to address gender issues in science and technology empowers decision-makers to take effective action. If these do not exist, gender mainstreaming methods can be used to identify the gender gap and differential impacts of policies on society in time for policy makers to adjust their approaches.

Pre-requisite: Without women's human rights written into the laws of a country, very little ground may be gained trying to institute gender-based analysis. Legislation and regulations regarding gender equality should be reviewed to ensure that the fundamental rights of gender equality and equity are being honoured by the government.

Phase 2: Legitimation

Experience in gender issues must exist: Personnel trained in gender issues and analysis are essential to begin the process. If these do not exist, training may be available from the National Women's Machinery (NWM), NGOs or consultants. It is equally important to have gender expertise within science and technology departments, as it is to have science and technology expertise within NWM offices.

Figure 6 Promoting Gender Equity through Government Structures

Level of Government	Organisation and Assignment	Reports to:
Prime Ministerial	Request S&T Advisory Bodies to examine issues of gender in science and technology (e.g. Canadian NABST 'Winning with Women').	Prime Minister
Parliament	Require reporting by S&T departments and/or agencies on the outcome of the systematic implementation of GBA using indicators of success.	Parliament through Central Agencies such as the Auditor General or Treasury Board
Inter-departmental	Place gender as a routine agenda item on the agenda of inter-departmental committees on science (with representation from energy, agriculture, natural resources, environment, industry, health, etc.) and request regular updates on progress closing the gender gap.	Ministers of S&T and Secretaries of State for NWMs
Specialised Agencies	Bureau of Statistics should be requested to systematically collect sex-disaggregated data and make all statistics public. Offices of Intellectual Property Protection should include consideration of indigenous knowledge (IK) systems and develop initiatives to address IK and its gender dimension.	Published for public with other national statistics. Developed with aboriginal & indigenous peoples
S&T Departments	Gender Advisory Committees, Action Committees for Women's Issues and Focal Points should help monitor GBA implementation within their department, arrange for gender-sensitivity training, and make recommendations.	Deputy-Minister Assistant Deputy-Minister
Research Councils	Designated Chairs responsible for Women in Science, Technology, and Engineering should promote scholarships for promising female scientists, serve as role models and mentors and ensure GBA is performed on all research proposals (see Box 2, page 18).	S&T Ministers and Board of Directors
National Women's Machinery	Inclusion of S&T expertise into the NWM to ensure that status of women offices are facilitated in their undertakings to include research and action agendas in science including ethical issues arising from research in biomedical sciences and ICTs among others.	Secretary of State for Women's Affairs
Inter-Governmental	S&T Ministers should promote gender equity in economic arenas and regional policy fora such as APEC (see APEC Ministers Meeting in Korea) and collaborate with policy networks like the APEC Women Leaders Network (WLN) to advance regional attention to closing the gender gap in S&T and attaining a sustainable and equitable science system globally.	APEC, MERCOSUR, CARICOM, NAFTA, OECD, etc.

Championing the issue within government: Identify a 'champion' to spear-head the initiative, someone who is well-positioned within government (with regard to key decision makers) and who has the credibility and power to influence others and convince them of the essential need to mainstream gender concerns into government machinery. Because raising the profile of the issue with the government, and subsequent changes in budget and/or policy, may require submitting memoranda to Cabinet or discussion papers, having a champion at the ministerial or deputy-

ministerial level will be essential. A committee may need to be formed to do the groundwork and research and report to the champion.

Seize opportunities where gender can be moved forward on the policy agenda: Link a gender element to another issue which has already gained legitimisation with policy-makers, such as human resource development or financial efficiency, to demonstrate how a gender-based analysis will improve the quality of policy and programmes.

Gender must be apparent in the allocation of staff, time and financial resources: Real resources are needed for decisions on mainstreaming gender to be fulfilled. Include gender-based analysis in the budget and plan of the department, which will raise its stature from a special-interest issue to standard operations.

Phase 3: Implementation/institutionalisation

In the case of science and technology, the implementation and institutionalisation will consist of the organisation of the following bodies, which will carry out the major actions to do with research and advocacy, policy and programme. Their work plans and reporting structures should be designed to achieve effective and efficient research and analysis of gender issues in science and technology and reporting of this, along with policy recommendations, to decision makers.

The NWM should collaborate with ministries responsible for science and technology in the staged implementation of a gender-based analysis process, including the development of tools, training materials and procedures, and the monitoring of the process itself. In so doing, the actors involved should draw on the experiences of other governments already using this approach and extensive resource materials developed world-wide. For example, gender-based analysis is being carried out by the governments of Australia, Canada and New Zealand.

Costs for implementing the gender-based approach should be within departmental allocations. These include customary operational costs such as training employees and conducting the analysis, both of which are part of ongoing business costs.

Phase 4: Monitoring and evaluation

Mainstreaming means that gender analysis becomes a permanent part of the planning and policy cycles. When gender-based analysis (GBA) is first being implemented, it should be scrutinised for its value to policy development in terms of staff time, budget, impact and obstacles. This evaluation will help to gauge whether GBA is truly being mainstreamed, what the barriers to this are and how they can be overcome in the next planning cycle. Measuring impact may be challenging since, like environmental impact assessments, the value comes in averting detrimental policies and outcomes. Furthermore, the rationale for policies that respect equity are fundamentally issues of human rights and justice more than human capital strategies. In any case, indicators should be clearly established to measure the effective and systematic use of the tool by all policy-makers.

Mainstreaming Gender in Science and Technology Research

In order to ensure that the research agenda supported by public funds is serving society in an equitable manner and that the impacts and beneficiaries are all clearly identified, GBA can be effectively employed by science and technology decision-makers to answer questions including:

- ♦ Have accommodations been made to include all the important informants in the research?
- ♦ Are the same questions asked of men and women?
- ♦ Is the language used appropriate, respectful and inclusive?
- ♦ Is the research based on sexist 'knowledge'?
- ♦ Does the research reflect a false hierarchy of characteristics and roles based on stereotypes of gender?

Have accommodations been made to include all the important informants in the research?

In order to include all the important informants in the research, consultations or focus groups need to be arranged at convenient times. Having these meetings at a time when only certain people can attend (e.g. during working hours, in the evening) means that the results will exclude the perspectives of those who could not attend. In communities where education for boys is favoured over that of girls, women's literacy rates will be lower than men's, and women will be less able to take part if interview methods require literacy and numeracy. The same may be said for different economic and ethnic groups within a society if access to education is unequal. And although one group may be able to speak about another, they cannot speak for them. This point is especially important when researching indigenous knowledge and technologies. It is also important that the appropriate person does the consulting. For example, in some cultures women are not able to speak freely and frankly to a man (and there may be cases where the reverse is true).

Are the same questions asked of men and women?

While women are often asked if they have conflicts between family and employment responsibilities, men are rarely asked this. Differential questioning will impose the researcher's own biases and assumptions regarding gender roles on the interviewees. The same question asked of women and men within the same context will often produce different answers, which is very significant and may lead to the creation of new knowledge on an issue.

Is the language used appropriate, respectful and inclusive?

If the research has been done in a way which provides sex-disaggregated data, the vocabulary should reflect this. In English, male terms are often used for generic references, such as 'mankind' instead of 'humanity'. As a rule, use sex-specific terms only for sex-specific references and generic terms only for generic references. If 'female-headed households' are meant, do not write 'one-parent households' which, although technically correct, obscures reality and the results of the research. If research has found parallel experiences between men and women, inclusive generic terms should be used. The same vocabulary should be used to describe equivalent characteristics and behaviours in women and men, girls and boys. For instance, calling a father working full-time the 'bread-winner', while calling a mother working full-time 'absent from children' is a reflection of the researcher's values. Where a profession has been male dominated, so that the title connotes a male professional, adding 'woman-' to the title makes women seem like anomalies. If it is necessary to say 'woman-scientist', 'female doctor', etc., the same should be done for men, i.e. 'male scientist' or 'male doctor'.

Is the research based on sexist 'knowledge'?

Previous knowledge on this topic must be questioned, since it may have been gender-blind or based on male experience and reality. How was this knowledge acquired? Were all perspectives incorporated or is this knowledge reflective of only one social reality? Probing the process which produced the knowledge may reveal that women's perspective has been omitted and that hence, what is known must be revised to take women's reality into account.

The lack of recognition of women's work has left them historically invisible in national census exercises. Women's work needs to be reframed from that of 'home-maker' to recognition of role of reproductive work in society (Waring, 1999). In a similar manner, rendering women's work visible in the rural sector requires recognition of their fundamental role in subsistence farming and food security. Women's innovations are often not apparent; and sometimes pirated and patented. The work of the Intermediate Technology Development Group (ITDG) in exploring women's indigenous innovations and video-taping women's inventions turned the spotlight on a much ignored source of innovation and knowledge.

Does the research reflect a false hierarchy of characteristics and roles based on stereotypes of gender?

For instance, in a study on occupational satisfaction, would it be assumed for a man that being a professional is most desirable and child-rearing would be least desirable, while for a woman, child-rearing would be assumed satisfactory and a professional career may be desirable but not necessary for occupational satisfaction? Choices and desires of women and men should be evaluated using equal standards, and the researcher should endeavour to reveal and break down such stereotypes.