

GUIDELINES FOR GENDER MAINSTREAMING IN SCIENCE AND TECHNOLOGY



RESGEST



**REGIONAL SECRETARIAT FOR GENDER EQUITY
IN SCIENCE AND TECHNOLOGY
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REGEST



FOREWORD

The following Guidelines on Gender Mainstreaming in Science and Technology are designed to demonstrate *what* gender mainstreaming is, *why* it is important in science and technological enterprise, and *how* to go about doing it.

There is a history behind the development and content of these Guidelines. It is worth summarizing as context for what follows.

Gender mainstreaming as a general strategy emerged during the early 1990s for ensuring equality of women with men in both contributing to sustainable development and in sharing development benefits. Two key influences were important. The first was the United Nations Third World Survey on the Role of Women in Development conducted in 1994. The second was the World Summit on Social Development held in 1995. The World Summit directly used the results of the Third World Survey as the basis for its deliberations on the social and human dimensions of development. As a result the Survey's findings were reflected in the ten Commitments that were agreed at the Summit. Commitment 5 specifically emphasizes the commitment of participating governments to promoting respect for the dignity of women and to the achievement of equality between men and women. The Commitment further recognizes the importance of women's participation and leadership roles in political, civil, economic, social and cultural life and development.

UNESCO through its Jakarta Office, Regional Science Bureau for Asia and the Pacific, brought this general Commitment to life in the Asia-Pacific region, referring to the specific domain of science and technology. Launching the process was the International Seminar on Women and

Technology organized by the UNESCO Office, Jakarta, in 1996. The Seminar concluded that as platform for organization of action, 'focal points' at national levels needed to be established along with a regional secretariat to coordinate across countries and to enhance mutual learning and synergies. In parallel, the UNESCO World Science Report of 1996, brought the gender dimension of science and technology into the public spotlight, with one of its three chapters being devoted to "Science, the Gender Dimension" – a chapter that dealt substantively with the principle of gender equity in both development contribution and benefit.

A process of change was launched. The idea that emerged from the International Seminar on Women and Technology, and indeed the women who created them, brought these ideas forward to the 1998 Asia Pacific Regional Preparatory Meeting in Sydney, and through an Asia-Pacific Workshop on Women and Gender in Science, Engineering and Technology associated with this regional forum, on to the World Conference on Science held the subsequent year, 1999, in Budapest. In parallel, other Regional Preparatory Meetings such as those held in Africa and Latin America addressed the same gender dimension of science and technology.

Consequently, the 1999 Budapest 'World Conference on Science for the Twenty-first Century' was strongly influenced by the emerging mobilization of opinion on Gender Mainstreaming in Science and Technology. Conclusions of a thematic meeting held within the Conference on gender, science and technology therefore were brought onto the world stage as two Main Outcomes of the World Conference, namely:

(i) *The Declaration on Science and the Use of Scientific Knowledge*, which underlines political commitment to scientific endeavour and to the identification of solutions of problems and concerns related to science and society, including gender issues; and,

(ii) *The Science Agenda: Framework for Action*, which contains commitments and specific recommendations on capacity building in science and its application to sustainable development with a gender perspective.

The UNESCO Office, Jakarta, within its regional mandate, maintained the commitment to a gender dimension in science and technology that had now been reinforced at a global level by the world's scientific community. In response to the Budapest Declaration and Framework for Action, the Regional Secretariat for Gender Equity in Science and Technology (RESGEST) that had been formed jointly by the UNESCO Office, Jakarta and the Indonesian Institute of Sciences – with funding support from the Government of the Netherlands through the Gender Advisory Board of the United Nations Commission on Science and Technology for Development, organized a regional workshop in October 2000 to elaborate action to be now taken at regional and national levels. A key agreed recommendation was the establishment of a national committee or its equivalent to facilitate gender responsive country specific action. So far, two national committees have been set up- the Philippines and Indonesia.

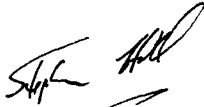
Action of RESGEST favours the empowerment of 'women-in-science'. In parallel, the UNESCO Office, Jakarta developed a regional programme targeting the beneficial impact of science and technology on women, particularly at grass roots village levels. This is the Asia Pacific Gender Equity in Science and Technology (APGEST) programme. With funding supplied by UNDP's Regional Programme based in the Philippines and within the UNDP Gender Equity Network (APGEN), APGEST published in 2003 '*Gender, Science and Technology "Asia Pacific Gender Mainstreaming Manual"*' – which has now been implemented in several countries including Indonesia.

Thus, we come a full circle back to the Indonesian National Committee on Gender, Science and Technology – source of the present *Guideline*. The *Guideline* has been produced to complement the Gender, Science and Technology Training Manual published by the UNESCO-APGEST Programme.

The present *Guidelines on Gender Mainstreaming in Science and Technology* provide all science and technology stakeholders with key ideas and guides relating the gender

dimension to the development and application of science and technology, and respond to some of the most directly relevant practical questions the stakeholders confront in association with their work.

I trust that you, the reader and science and technology practitioner, will find these Guidelines helpful as you contribute to the important task of *mainstreaming gender in science and technology and its contribution to sustainable development*.

A handwritten signature in black ink, appearing to read 'Stephen Hill', written in a cursive style.

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I. INTRODUCTION

A. Background

The Advancement of women and the achievement of equality between women and men in science and technology are a matter of human rights and a condition for social justice and should not be seen as a women's issue. They are one of the strategic means to build a sustainable, just and developed society. Empowerment of women and gender equality in science and technology is one of the pre-requisite for achieving political, social, economic, cultural and environmental security among all peoples.

The gender dimension of science and technology entered the world science agenda through the United Nations Commission on Science and Technology for Development (UNCSTD) since its first session in 1993. This concern emerged from more than two decades of gender studies around the world and concerns expressed by series of international conferences including three on women¹ and two world surveys on the role of women in development² as well as the 1984 concerns expressed by science and technology experts³ about the situation of women in the fields of environment and natural resources, education, information and communication, health, food security and women's indigenous knowledge.

Gender mainstreaming has been globally recognized as the most effective strategy to achieve gender equality and

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- 1 Report of the World Conference of the International Women's Year, Mexico City, 19 June – 2 July 1975 (United Nations Publication, sales No E.76.IV.1); Report of the World Conference of the United Nations Decade for Women: Equality, Development and Peace, Copenhagen, 14-30 July 1980 (United Nations Publication, sales No E.80.IV.3); Report of the World Conference to Review and Appraise the Achievements of the United Nations Decade for Women: Equality, Development and Peace, 1976-1985, Nairobi, 15-26 July 1985 (United Nations Publication, sales No. E.85.IV.10)
 - 2 World Survey on the Role of Women in Development, 1984 (United Nations Publication, sales No.E.86.IV.3); World Survey on the Role of Women in Development, 1989 (United Nations Publication, sales No.E.89.IV.2).
 - 3 United Nations Advisory Committee on Science and Technology for Development.

justice in all fields of life and in all sectors of development. Obviously, Science and Technology is no exception.

B. What is Gender Mainstreaming

Gender mainstreaming is a means to ensure that:

- a. Experiences, aspiration, knowledge, needs and concerns of both men and women are integrated in:
 - i. the formulation of policies and decision making;
 - ii. the planning, programming and budgeting;
 - iii. the monitoring and evaluation of progress achieved and obstacles encountered in the implementation process of plans and program.
- b. Women's participation is equal to, and on an equal basis with men, in all activities and at all levels.
- c. women and men share equally the benefit resulting from the implementation of policies, plans and programs in all sectors of development.

C. Why Gender Mainstreaming in Science And Technology is Needed

Data and gender studies around the world for the last twenty years, in many countries in the Asia Pacific region, including in Indonesia demonstrated that women lagged behind men in science and technology education and training, careers, participation in policy and decision making positions as well as in the enjoyment of benefits emanating from science and technology development and application.

Recognition of these facts and realities around the world, has led UNCSTD to commission a gender working group in 1993 to further elaborate particularly on the nature and root causes of such gender gaps. The Gender Working Group was tasked to come up with its report and recommendations for action to eliminate gender gaps and to achieve gender equality and justice in science and technology.

UNCSTD Gender Working Group identified seven key issues that is considered to be particularly important and for which transformative actions were both necessary and feasible

and therefore strongly recommended. These issues are:

- 1) *Gender equity in science and technology education*
- 2) *Removing obstacles to women scientific and technological careers.*
- 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*
- 7) *Improving the collection of gender disaggregated data for policy makers.*

The identification of the seven key issues has contributed to the substantive deliberations on the issue at the Fourth World Conference on Women in Beijing in 1995 as well as to the drafting of Chapter III: The gender Dimension of Science and Technology of UNESCO's World Science Report of 1996.

The culmination of the recognition of the gender dimension of science and technology in the World Science Agenda is reflected in the convening of a thematic meeting on "*Gender, Science and Technology*" during the *World Conference on Science for the Twenty First Century: A new Commitment*, in Budapest in 1999.

The conclusions and recommendations of the thematic meeting were reflected in both the Budapest Declaration and the Science Agenda: Framework for Action, adopted by the World Conference.

In response to the call of the Budapest World Conference and in line with Indonesia's active participation in UNESCO –UNCSTD Program on the "Regional Secretariat for Gender Equity in Science and Technology in Southeast Asia and the Pacific" (REGEST)⁴ and in UNESCO-UNDP Asia Pacific Gender Equity for Science and Technology (APGEST) Project, the Indonesian Strategic Policy for National Development of Science and Technology of 2003 included gender dimension. In order to ensure its proper implementation, in July 2003, the Minister of Research and Technology established a National Committee on Gender, Science and Technology, which is co – chaired between the ministries of Research and

4 Formerly known as Regional Secretariat for Gender, Science and Technology (REGSEC)

Technology, Empowerment of Women, National Education and National Development Planning.

In 2003, UNESCO Office Jakarta through the Asia Pacific Gender Equity in Science and Technology (APGEST) project in the Asia Pacific Region, funded by APGEN-UNDP the Philippines, published in 2003: *Gender, Science and Technology "Asia Pacific Gender Mainstreaming Training Manual"*. The manual intends specifically to enhance capacity building in training for leaders in the field of gender equity in science and technology as well as capacity building in the empowerment of women, particularly poor and marginalized women.

This guideline constitutes one of the committee's initial undertakings.

Objectives of the Guidelines

The guidelines intend to provide stakeholders with key ideas and guides relating to the development and application of science and technology with a number of practical questions associated with:

- a. gender mainstreaming in their respective work
- b. monitoring and evaluation of their progress in achieving gender equality and justice in science and technology
- c. gender differential impact of science and technology

II. SCOPE, TARGET GROUPS AND INSTITUTIONS OF THE GUIDELINE

A. Scope

The guidelines covers the various stages of activities in the development and application of science and technology, namely:

- a. education and training
- b. research and development (R&D)
- c. policy formulation and decision making, including research priority setting
- d. planning, programming and budgeting
- e. monitoring and evaluation of progress . achieved and obstacles encountered
- f. gender differential impact studies
- g. statistical data collection and analysis
- h. science and technology reporting

B. Target Groups

Target groups of the guidelines are those involved in the various stages of activities such as:

- a. teachers and lecturers
- b. research and development managers and principal investigators
- c. researchers, technologists and technicians
- d. policy and decision makers, including those who set research priorities

- e. planning, programming and budgeting officers
- f. monitoring and evaluation teams/groups
- g. gender differential impact study teams/groups
- h. statisticians
- i. science and technology reporters

C. Target Institutions

Target institutions constitute, but not limited to the following:

- a. Education and training institutions, from pre-school to higher education institutions
- b. R&D institutions
- c. Policy and Decision making institutions, commissions, councils, advisory bodies.
- d. Planning, Programming and Budgeting Institutions
- e. Scientific professional organizations

III. GENDER MAINSTREAMING BY TARGET GROUPS

A. Teachers and Lecturers

Gender mainstreaming in science and technology is for the benefit of all – women and men as well as young and old – and therefore it is essential that teachers and lecturers are aware of the fact and act to ensure that boys and girls as well as female and male students:

- a. have, and are enjoying their equal rights:
 - i. to pursue studies in science and technology
 - ii. to receive proper science teaching
 - iii. to be encouraged, supported to become scientists and technologists if they so desire.
- b. are being treated and given equal opportunities during the learning and teaching processes:
 - i. to interact with their teachers, lecturers and with each other
 - ii. to develop their own ideas and views on certain issues.
- c. are having equal access to the necessary teaching aids, facilities and other resources.

B. R&D Managers and Principal Investigators

Gender mainstreaming in science and technology is for the benefit of all – women and men as well as young and old – and therefore it is essential that R&D managers and principal investigators are aware and act to ensure that female and male researchers have equal rights to participate in:

- a. the research priority setting
- b. the selection of research topics
- c. the development and formulation of research proposals
- d. the access to research funds and facilities
- e. the assessment of progress achieved and obstacles encountered

C. Researchers, Technologists and Technicians

Gender mainstreaming in science and technology is for the benefit of all – women and men as well as young and old – and therefore it is essential that male and female researchers, technologists and technicians are aware of their responsibility and act to ensure that:

- a. they respect and treat each other as equal partners
- b. their respective work is not simply aimed at achieving progress in science and technology, but should also be aimed at meeting the needs of society which consist of women and men who's conditions, needs and concerns are not the same due to biological differences. Similarly, the differences in knowledge, experiences, and perspective result in different expectation and treatment by society.
- c. their work properly consolidate the experiences, knowledge, aspiration and concerns of both men and women, as this is essential for the provision of support to the success of human centered sustainable development.

D. Policy and Decision Makers

(Top policy makers in the executive, legislative and judiciary branches of state government responsible for science and technology)

Gender mainstreaming in science and technology is for the benefit of all – women and men as well as young and old – and therefore it is essential for policy and decision makers in science and technology to recognize the need for human centered sustainable development and the critical role of

science and technology for effective planning, programming and implementation of such development.

Science and technology for human-centered sustainable development implies that:

- a. Science and technology development actors consist of men and women.
- b. Boys and girls as well as women and men enjoy equal rights to receive science and technology education and training in all disciplines and at all levels.
- c. Science and technology decision makers consist of men and women proportionately so as to ensure that:
 - i. experiences, knowledge and aspiration of both women and men are taken into consideration and serious account in the formulation of policy and decision making.
 - ii. science and technology contribution to human centered sustainable development indeed leads to the meeting of the needs and concerns of the entire society, both men and women equally.

Consequently, it is essential for science and technology policy and decision-makers to take into serious consideration during the entire stages of their decision making process a number of existing realities such as science and technology related policies, strengths, weaknesses, opportunities and challenges as well as availability of sex-desegregated data.

For example: case of Indonesian S&T Policy.

- a. the Indonesian Strategic Policy for National Development of Science and Technology of 2003 (JAKSTRA pembangunan iptek 2003) which contains principles to ensure that:
 - i. science and technology development needs to apply gender perspective, so as to realize gender equality and justice (JAKSTRA IPTEK 3.1, Prinsip Dasar no. 8)
 - ii. control and application of science and technology is humane, so as to be supportive to the realization of justice in national life; build upon community's

- potency and aimed at meeting their needs. (JAKSTRA IPTEK 3.2, Visi)
- iii. science and technology development's support is enhanced in order to strengthen socio political order, including gender equality (JAKSTRA IPTEK 3.3, Misi No. 4)
 - iv. Studies be carried out on the weaknesses of institutional structure which need to be overcome immediately in order to reduce impact of socio political gap and provide support to gender equality through harmonious atmosphere in order to continuously strengthen the basis for social solidarity (JAKSTRA IPTEK 3.4, No 2)
- b. the existing science and technology strengths, weaknesses, opportunities and challenges in providing support to human-centered sustainable development
 - c. the most recent sex-disaggregated data about existing science and technology "actors" and all people who are going to be impacted by their policies/decision as well as their actual overall and specific- socio economic, political and security condition.

E. Officers for: Planning, Programming and Budgeting; Monitoring and Evaluation; Impact study and Statistical collection and analysis

These officers must be familiar with and able to apply existing gender mainstreaming guidelines – nationally, regionally as well as internationally. Gender Analysis Pathway (GAP) is an excellent tool for gender mainstreaming. This means that in their work, they should follow the 6 established steps for the application of GAP, as follows:

- **Step 1:** Assess whether or not commitments to the objective of gender equality in science and technology contained in the Strategic Policy on Development of Science and Technology are reflected in the objectives of the existing plans and programs. If not, their objectives should be adjusted and the objectives of the future plans and programs should be formulated in such a way so as to comply to those commitments.

- **Step 2:** Quantitative data (sex-disaggregated statistics) and qualitative data (information, in particular research findings about causes of existing gender gaps) must be used to assess the differential impact on women and men of existing science and technology policies, plans and programs. Results of such assessment should be used in formulating new plans and programs which contain measure to close gender gaps and promote gender equality and justice throughout the entire stages of activities for the development and application of science and technology for human-centered sustainable development.
- **Step 3:** Analysis must be conducted to properly identify the variety of gender gaps, such as lack of equal access by girls and women to education and training, career, policy and decision making as well as to control of resources, funds and facilities, and benefit from science and technology progress and application. Proper understanding of the variety of gaps will facilitate the identification of appropriate measure to eliminate them.
- **Step 4:** Further understanding of the gender issues emanating from the gender gaps also needed to be identified. Both their root causes (such as gender gaps in science and technology education and career are caused by stereotyped perception about the unsuitability or inappropriateness for women to study or develop career, let alone participating in policy and decision making position in science and technology), and their impact on society, in general on women in particular, (such as the absence of women in policy and decision making position and the very low participation in scientific careers as well as high infant and under-five mortality rate and low level of nutritional status of lactating mothers and children, high maternal mortality rate and high prevalence of anemia among mothers), must be properly understood. Such understanding will facilitate the identification of effective measures for their redress.
- **Step 5:** Step 1 to 4 clearly demonstrate that gender gaps exist which have impact on society at large on women in particular. This is unacceptable and constitute serious obstacle to the achievement of gender equality and justice in science and technology. Therefore, planning, programming and budgeting officers must include specific and concrete measures to close those gaps by:

- a. meeting practical gender needs, which means meeting the actual situational needs of women and men.
 - b. meeting strategic gender needs, which means introducing gender mainstreaming in their respective work as planners and programmers, in order to close existing gender gap; to enable men and women to view and treat each other as equals in contributing to and benefiting from science and technology progress and application in everyday life.
 - d. allocating funds in the budget document for gender program, projects and activities to meet both practical and strategic gender needs
- **Step 6:** Both quantitative and qualitative indicators must be established in order to be able to measure the success of the previous and existing policies, plans and programs.

Quantitative indicators may consist of, but not limited to sex-disaggregated statistics on:

- a. participation in basic education, in vocational and technical training as well as science and technology enrollment and completion of study at both high school and higher education institutions.
- b. researchers, technologists and technicians in different science disciplines and at all levels of senior positions
- c. science teachers and lecturers, professors, deans and rectors
- d. directors of R&D institutions in different research areas/ science disciplines
- e. policy and decision makers as well as officers in senior positions in the executive, legislative and judiciary branches of state government related to science and technology, including those members of science advisory and research councils
- f. members and executive board of scientific profession's organizations
- g. statisticians

Qualitative indicators may include but not limited to:

- a. peoples overall health conditions and nutritional status by sex and age
- b. number of inventors and acquisition of patents by sex
- c. invention of new technologies, the application of which contributed to the reduction of women's workload for the conduct of their stereotyped traditional responsibilities such as daily family chores (practical needs)
- d. invention of new technologies and their application in the production process which are both human-energy and time saving, so as to promote women's access to employment.
- e. application of information and communication technology (ICT) in the transfer of information and knowledge to people, particularly to women in the remote and poor areas, as one of the strategies to empower women.

IV GENDER MAINSTREAMING BY TARGET INSTITUTIONS

A. Education and Training Institutions

Each institutions must ensure that: their recruitment system, organizational culture, curriculum, text book, teaching – learning aids, teaching methods, performance appraisal and award systems in the area of science and technical subjects are free from gender based discrimination (see definition of discrimination against women in para 1 of the Convention on the Elimination of all Forms Discrimination Against Women or CEDAW convention).

B. R&D Institutions

All institutions must ensure that:

- a. their recruitment, management, remuneration, performance appraisal and award as well as promotion systems are free from gender based discrimination (CEDAW convention para 1)
- b. their programs of work are designed with equal participation of male and female researchers and are aimed not only at the advancement of science and technology but also at meeting practical as well as strategic gender needs of society, in line with the essence of human-centered sustainable development
- c. their monitoring and evaluation systems are carried out with gender perspective, so as to identify the extend to which their activities have reduced, perpetuated or created gender gaps in society, in science and technology in particular.

C. Policy and Decision making Institutions

(Ministry of Research and Technology, Higher Education Institutions, Research Councils, Advisory Committees etc)

Each of these institutions must ensure that:

- a. their work be preceded by analysis of sex disaggregated data about the target groups of their policy and decision, so as to have a clear idea about their practical and strategic gender needs
- b. their policy provides direction and outlines highest priorities in order to ensure that:
 - i. men and women master and able to utilize science and technology to eliminate gender gaps and meet society's practical and strategic gender needs
 - ii. science and technology provides support to the development of the nation's just society including gender equal and just society
 - iii. women and men are able to maintain the sustainability of natural resources and quality environment by applying relevant science and technology.
 - iv. society's potency and needs, including practical and strategic gender needs, are fully taken into consideration.
 - v. scholarships, awards and incentives are extended to deserving boys and girls, women and men to pursue careers in science and technology.
 - vi. the use of ICT is encouraged in all institutions of government, local and national agencies and educational or academic institutions, as a means to speed up gender mainstreaming in their respective work.

D. Planning, Programming and Budgeting Institutions

(In Indonesia include: National Planning Institutions: BAPPENAS; Ministerial, Provincial, District down to village level Planning, and Programming; National Budgeting Institutions: Ministries of research and technology and Finance, Parliament Commission VII and the relevant Commission at Provincial and District Parliaments)

Each of these institutions is also obliged to include gender mainstreaming as one of their planning, programming and budgeting strategies. To this end, the following principles must be adhered to:

- a. the formulation of science and technology plans and programs involves women on an equal basis with men, and their experiences, knowledge, needs and concerns are taken into account appropriately.
- b. science and technology plans and programs are designed to respond to existing gender gaps – to reduce them and/or provide redress
- c. plans and programs are designed to prevent the perpetuation of existing gender gaps or the creation of additional gender gaps in science and technology.

Consequently, budget allocation must also consider those issues in order to ensure that adequate funding is allocated to those programs most promising not only for the general promotion of gender equality and justice in science and technology, but more specifically for the meeting of practical and strategic gender needs of women and men, in society at large.

V NETWORKING

Networking as, an essential partnership mechanism among all stakeholders is not only essential for the advancement of science and technology but also for their effective application to support human-centered sustainable development.

In science and technology, key stakeholders are, but not limited to:

- a. scientists and technologists themselves individually and as groups in different scientific profession's associations such as associations of: medical doctors, engineers, lawyers, chemists, biologists, ICT specialists; in short, the scientific community
- b. relevant government institutions: executive, legislative and judiciary branches, from local to global levels.
- c. relevant regional and international organizations, both governmental and non-governmental.
- d. private sectors which are both heavily dependent on and supportive to science and technology.

These stakeholders interaction varies from country to country, from discipline to discipline, as there is no established or standard mechanism for effective networking or for meeting the specific needs of each of the variety of networks.

It is therefore most crucial for governments and the scientific community themselves to continuously promote and enhance the effectiveness of such partnership mechanisms at all levels and in all fields. Special emphasis must be put on the interaction between the natural sciences and social sciences so as to ensure that:

- a. science and technology is developed and applied humanely. And this in turn requires the contribution of

women and men and their respective experiences, knowledge and concerns.

- b. concerted efforts are maintained for the identification, evaluation and monitoring of the risks and benefits of current and emerging technologies with a gender perspective.

This is particularly critical for the establishment of concerted action by all key stakeholders and by all men and women towards the achievement of gender equality and justice in science and technology as one of the most far-reaching fields and as essential means for the survival of the human race, men and women, young and old or life as a whole. At the same time it should also be recognized that, the uncontrolled or inappropriate development and use of science and technology as well as neglect of scientific research findings, might result in the destruction, and even extinction of all life on earth.