

Taller Regional Latinoamericano asociado al proyecto
***"A Global Approach to the Gender Gap in Mathematical and
Natural Sciences: How to Measure It, How to Reduce It?"***

FIRST TASK: Collaborating with the design of the
Questionnaire for the Survey

SECOND TASK: Learning and discuss about existing lists
of best practices (and policies to implement them) with
ideas that are applicable to our Region.

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"A Global Approach to the Gender Gap in Mathematical and Natural Sciences: How to Measure It, How to Reduce It?"

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Lilliam Alvarez,

Academia de Ciencias de Cuba

lillam@ceniai.inf.cu



From general Problems to our main concern: Women in Sciences, Women in Physics and Maths

1. Climate changes ?
2. Vulnerabilities ?
3. Scarcity of Resources ?
4. Water ?
5. Energy ?
6. Food ?
7. Environment ?
8. Pollution ?
9. Habit of consumptions ?
10. Social and economical order ?

One specimen is in dangerous: the Humankind

Who take the decisions ?

Governance vs **Economical power**

Defining Development and Progress:

- Recovering the Human Dignity
- Cultural Identity
- Institutional Organization
- Ecological Sustainability
- ✓ Including Women in the social life
- ✓ Eliminating all kind of Racism
- ✓ Literacy
- ✓ Food
- ✓ Health Care
- ✓ Education
- ✓ Housing
- ✓ Social Commitment of Scientists
- ✓ Social Appropriation of S&T –
- ✓ Citizens with a general integral Culture

Social actors and their role in the transition towards sustainable development:

- ✓ The Political will
- ✓ The family : Women play a crucial role !
- ✓ The school and the universities
- ✓ The community
- ✓ The Non-governmental organizations, as the Scientific societies and the Academies
- ✓ The individual
- ✓ Media: The diffusion media have a fundamental role in the direction of the public opinion and have a considerable influence in the formation of new conceptions and culture
(...vs. consumption habits and wrong life styles).

GAPS IN THE WORLD

DEVELOPED COUNTRIES HAVE :

- *20% of the World population*
- *70 % of the Researchers*
- *85% of the investments in R&D*

-Gender Gaps

-Hunger

-Poverty

-Illiteracy

Some figures:

3/5 parts of the poorest people of the world
are women and girls

70% of the 130 millions of non-studying
persons in the world are girls

2/3 parts of the 960 millions of illiterates in
the world are women



GAPS IN EDUCATION:

Method: “Yo sí puedo”*,

(Yes, I can):

**Un método para erradicar el
Analfabetismo en el mundo**

Sólo se necesita Voluntad política

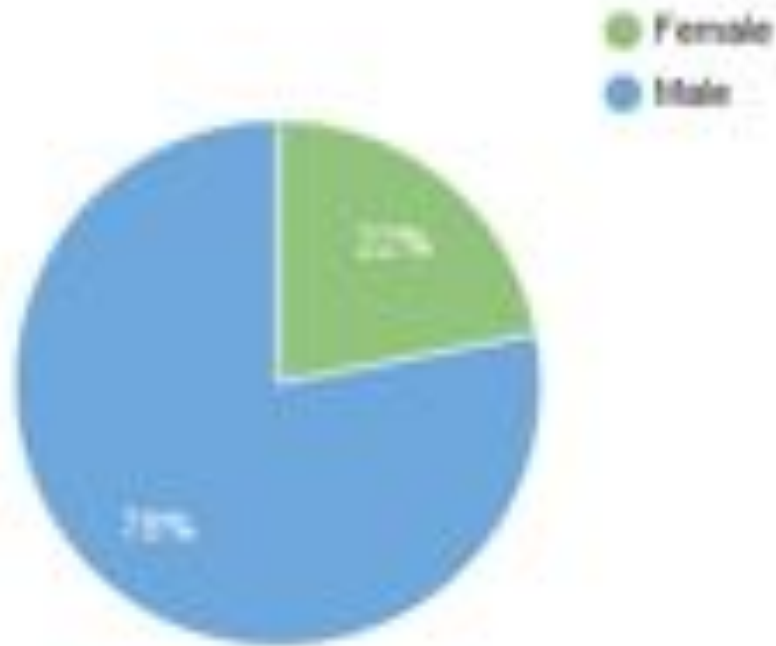
*** UNESCO Prize “Rey Sejon” , 2006**

Mas argumentos:

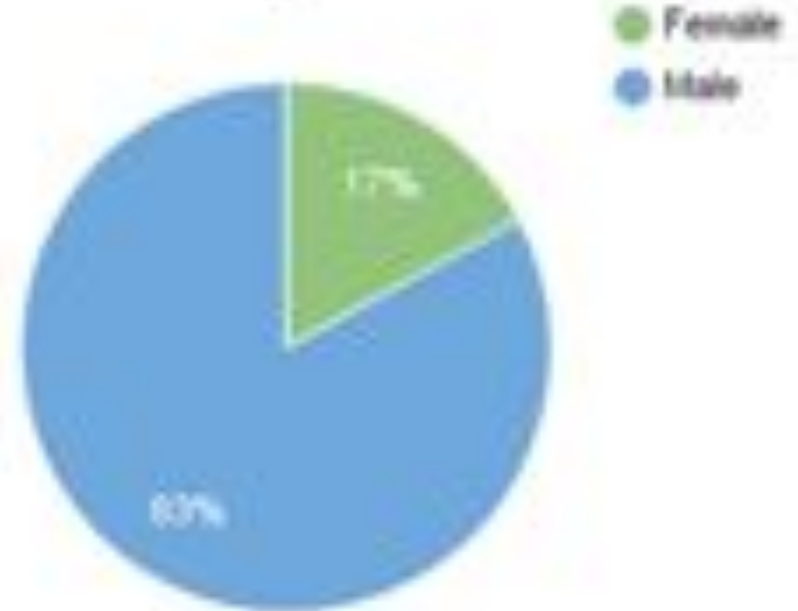
- Las mujeres son mayoría en los llamados empleos vulnerables
- En el mundo son los países Sub-Saharianos los mas críticos
- Uno de cada 5 niños por debajo de los 5 años esta bajo peso
- Existen diferencias nutricionales entre los niños en asentamientos urbanos y rurales y las diferencias mas grandes son en América Latina y el Caribe
- La pobreza es el mayor determinante de esa desnutrición en todas las regiones del mundo
- El número de refugiados y desplazados en los nuevos escenarios de guerra son en mayoría mujeres y niños

- **Las mujeres en el foco de atención:
Sexo, poder e influencia científica**

**Gender split in national
parliaments (global average)**



**Gender split of government
ministers (global average)**



Source: [UN Women](#)

*“These women leaders recognise that if scientific research and products are to benefit local economies and communities, **women’s needs and experiences must be built into both the design and the implementation process.**”*



17 Metas para el Desarrollo sostenible

Meta 5:

Alcanzar la equidad de género y empoderar a mujeres y muchachas

About two thirds of countries in the developing regions have achieved gender parity in primary education

In Southern Asia, only 74 girls were enrolled in primary school for every 100 boys in 1990. By 2012, the enrolment ratios were the same for girls as for boys.

In sub-Saharan Africa, Oceania and Western Asia, girls still face barriers to entering both primary and secondary school.

Women in Northern Africa hold less than one in five paid jobs in the non-agricultural sector. The proportion of women in paid employment outside the agriculture sector has increased from 35 per cent in 1990 to 41 per cent in 2015

In 46 countries, women now hold more than 30 per cent of seats in national parliament in at least one chamber.

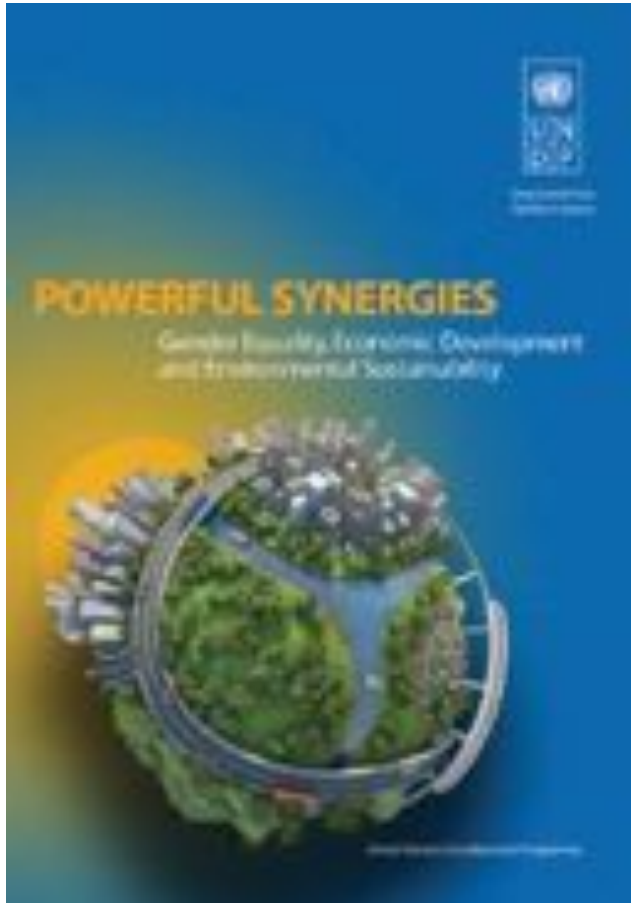
<http://www.un.org/sustainabledevelopment/gender-equality/#>

Día Intenacional de las mujeres y jóvenes en las Ciencias

En Diciembre de 2015 las Naciones Unidas adoptaron una Resolución para reconocer el **11 de Febrero** de cada año la contribución de las Mujeres a La Ciencia . Una investigación de las ONU mostro que las mujeres seguimos siendo excluidas de una participación plena en la ciencia, con un numero de graduados universitarios a nivel global que es aun significativamente mas bajo que los hombres.



- **El acceso equitativo de las Mujeres al control de los recursos no sólo mejora la vida de individuos, familias y naciones, sino que ayuda a asegurar la sostenibilidad ambiental.**



This publication, **Powerful Synergies: Gender Equality, Economic Development and Environmental Sustainability**, is a collection of evidence-based papers by scholars and practitioners that explore the interconnections between gender equality and sustainable development across a range of sectors and global development issues such as energy, health, education, food security, climate change, human rights, consumption and production patterns, and urbanization.

The papers in this publication make detailed recommendations for policy makers and practitioners to ensure that policies and programmes effectively integrate gender equality and that women participate fully and meaningfully.

<http://www.undp.org/content/undp/en/home/librarypage/womens-empowerment/powerful-synergies/>

Empoderar a las Mujeres es la clave para construir el Futuro que queremos

- “Existe una abrumadora evidencia de prestar atención a las necesidades de las muchachas y las mujeres ”
- “El empoderamiento de las Mujeres es catalítico y central para alcanzar las Metas sociales y medioambientales”
- “Las Mujeres son actores – o actrices- centrales en hacer una estrategia triple ganadora para el desarrollo sostenible: **CRECIMIENTO ECONÓMICO, DESARROLLO SOCIAL Y SOSTENIBILIDAD AMBIENTAL**”

PORQUE

...las mujeres no somos

una minoría,

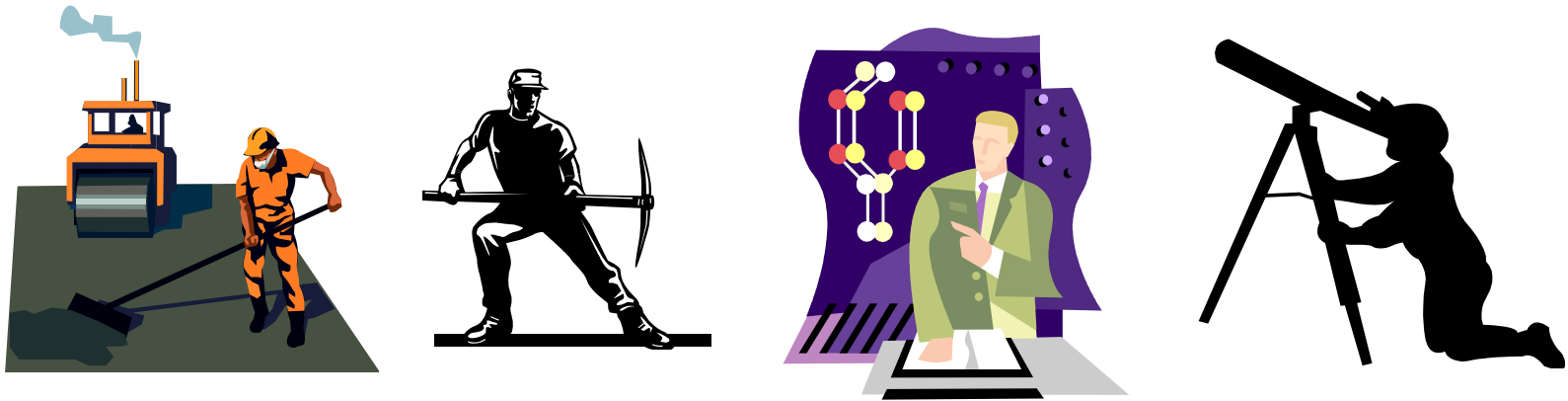
**constituimos la mitad de la
humanidad ...**

**¡ y somos las madres de la otra
mitad !**

**La falta de participación
política, económica y
cultural de la mujer**

**retrasa necesariamente a
aquellas sociedades que
mantienen la inequidad.**

WOMEN IN SCIENCES IN THE WORLD



CAREFUL ! : MEN WORKING

...And Is Science only for rich
(persons, countries) ?

La otra mitad del capital humano para la ciencia todavía es minoría



As countries grapple with the need to establish a pool of scientists or researchers that is commensurate with their ambitions for development, **their attitudes to gender issues are changing.** Some Arab States now have more women than men studying natural sciences, health and agriculture at university.... **Some 37% of researchers in the Arab world are women, more than in the EU (33%).** On the whole, women constitute a minority in the research world. They also tend to have more limited access to funding than men and to be less represented in prestigious universities and among senior faculty, which puts them at a further disadvantage in high-impact publishing.

The regions with the highest shares of women researchers are Southeast Europe (49%), **the Caribbean, Central Asia and Latin America (44%).** Sub-Saharan Africa counts 30% women and South Asia 17%. Southeast Asia presents a contrasting picture, with women representing 52% of researchers in the Philippines and Thailand, for instance, **but only 14% in Japan and 18% in the Republic of Korea .**

Una mujer por cada nueve hombres en la élite de la ciencia europea

Se agrava la escasez de investigadoras en uno de los programas científicos más prestigiosos de la UE

- El interés de las mujeres por la ciencia depende de cómo se pregunte
- “Muchas mujeres dejan de competir a este nivel porque tienen otras prioridades”

NUÑO DOMÍNGUEZ 6 JUL 2015 - 12:13 CEST



MUJERES Y CIENCIA

➤ Las mujeres ocupan solo uno de cada cinco puestos de mayor nivel en investigación

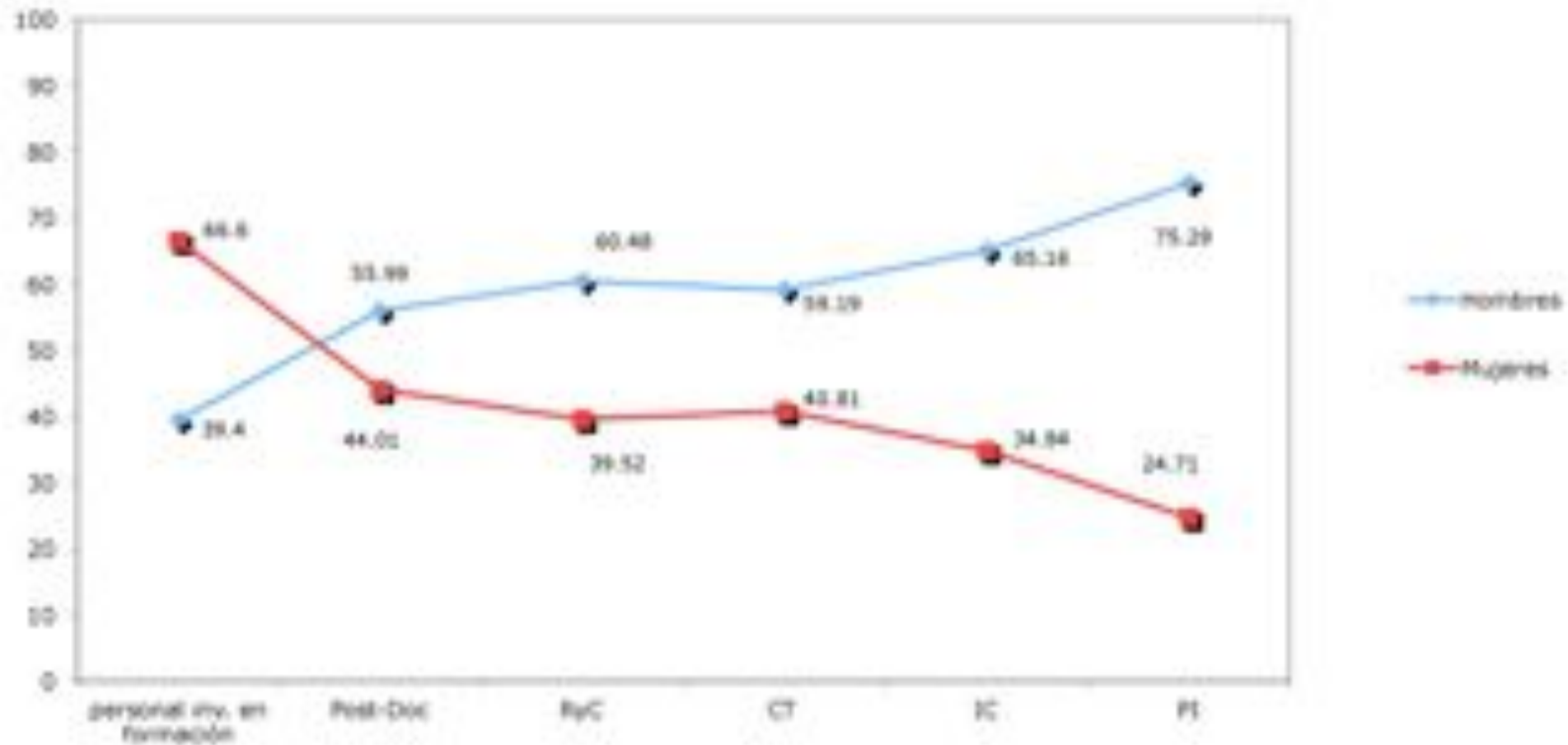
➤ “_ Sugerir que los hombres y las mujeres son diferentes es un tabú”

➤ El secreto por el que Rumanía es el país con más mujeres científicas de la UE

➤ Los recortes frenan el avance de las mujeres en la ciencia

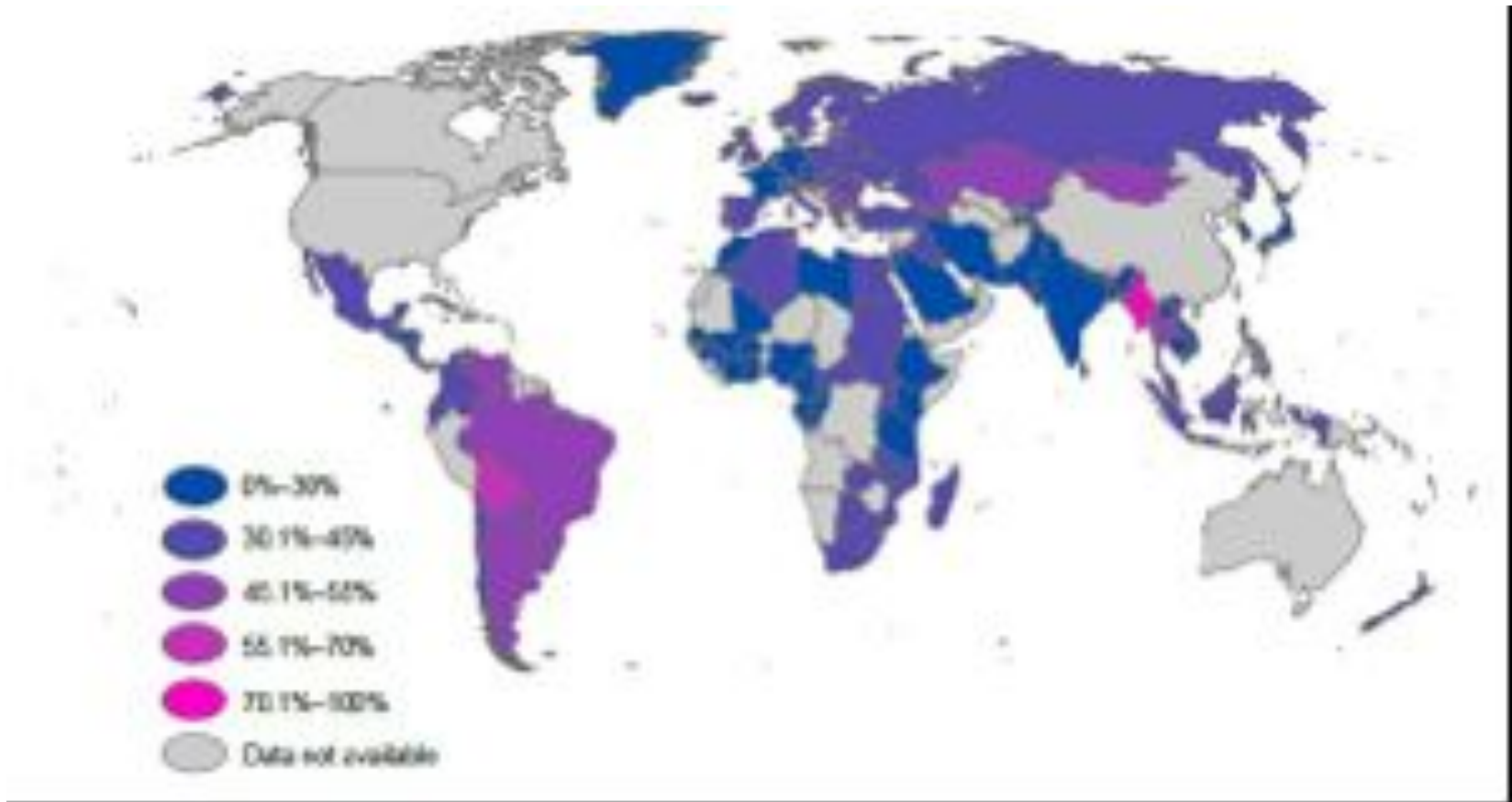
ESPAÑA, 2014

Personal Investigador CSIC 2014



EFFECTO TIJERA

Panorama global de participación de las Mujeres en la Ciencia

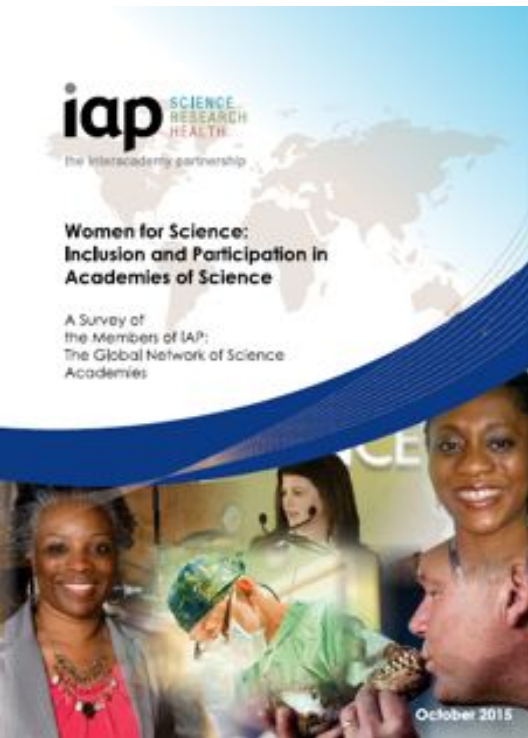


Source: UIS (2002). *Women in science*. UIS fact sheet, December 2012, No 23.

WOMEN IN THE NATIONAL SYSTEMS FOR S&T

- **América Latina y el Caribe : 45%**
- **Oceania: 39%**
- **Africa: 35%**
- **Europe: 34%**
- **Asia: 19%**

IAP SURVEY, 2016



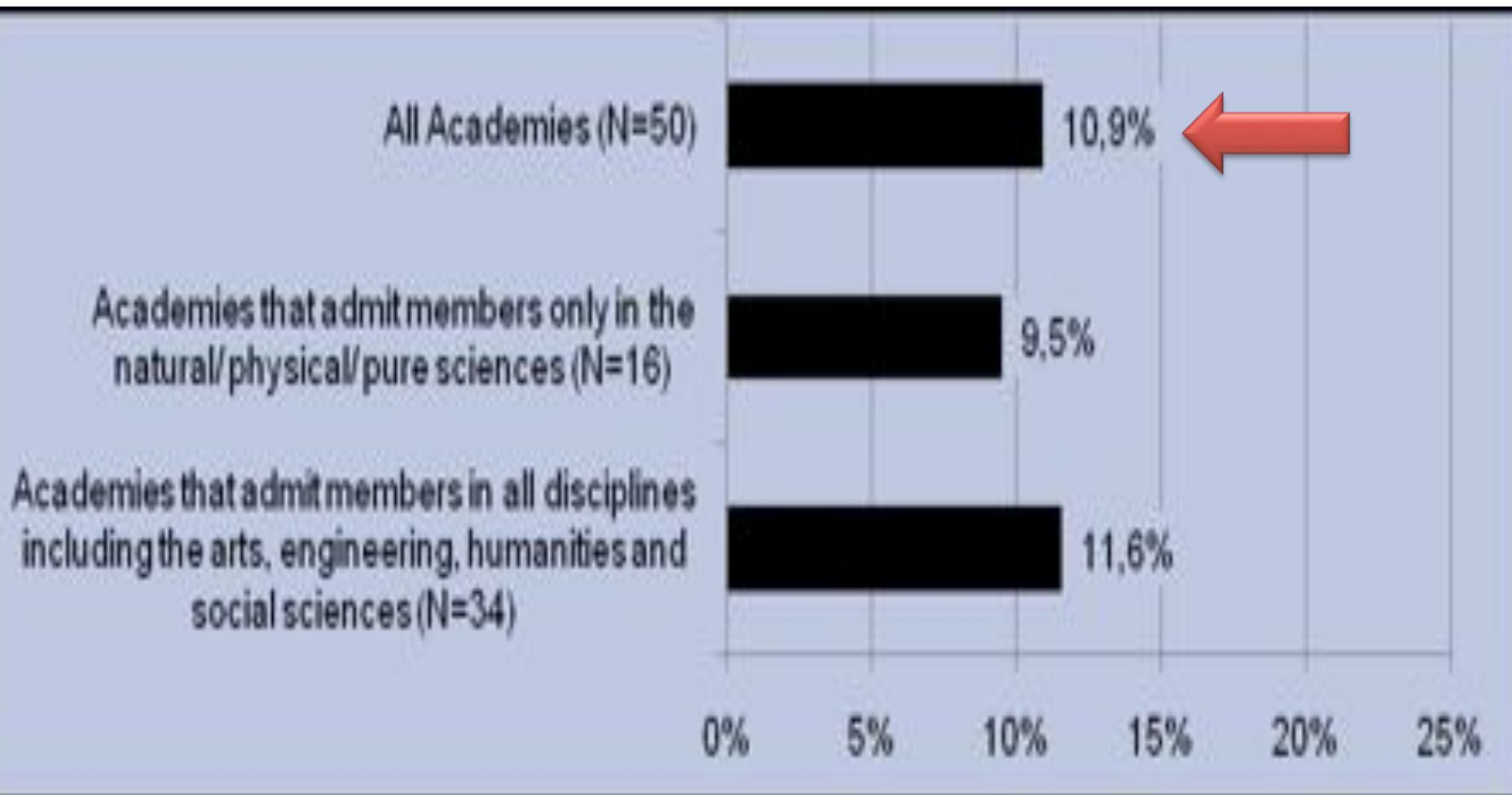
The report points out that “great strides have been made in enrolling more women in undergraduate courses, especially in the biological and chemical sciences (success has been more limited in the areas of physics, mathematics and engineering), there remains significant challenges in ensuring that the best women scientists are able to have fulfilling careers with increasing levels of responsibility, eventually taking up leadership and decision-making positions.”

National academies with the largest shares of women members are the Cuban Academy of Sciences (27%) and the Caribbean Academy of Sciences (26%). The national science academies of Mexico, Nicaragua, Peru, Uruguay and Honduras are among the list of the top 10 academies with the largest shares of women members.

The National Academy of Sciences in the US (47%), together with two European academies (Switzerland and Sweden, both 47%), have the best representation of **women as members of the governing body. Outside Europe, Cuba recorded 40%, Canada, 38%....**

Women in the Academies of the world

% of the memberships



65% de 52 Academias reconocen que han incrementado significativamente el numero de mujeres en las nominaciones para sus membresias

La peor representación de las mujeres en las Academias son en las **Ingenierías y en las Matemáticas:** en ambas representan solo un **5 %**_ Lo cual es lógico si sabemos que ellas son minoría al elegir estas profesiones.

% de Mujeres por grupos de disciplinas en las Academias:

Broad discipline	Total number of members (summed across 51 academies)	Total number of women members (summed across 51 academies)	% Women members
Social Sciences, Humanities and Arts	4852	742	15%
Medical and Health Sciences	2766	358	13%
Biological Sciences	2592	327	13%
Agricultural Sciences	803	94	12%
Earth and Environmental Sciences	1280	92	7%
Computer Sciences/ICT	626	42	7%
Physical and Chemical Sciences	3353	219	7%
Mathematical Sciences	1098	54	5%
Engineering Sciences	1668	80	5%
Other disciplines	690	82	12%

How to reduce the Gap?

- **ROLE MODELS**



ACUERDO DEL PLENO DE LA *Academia de Ciencias de Cuba,*

Julio, 1999.

**“CREAR LA COMISIÓN DE MUJERES
ACADÉMICAS DE LA ACC CUBANA Y
COORDINAR EL TRABAJO DEL CAPÍTULO
NACIONAL DE LA TWOWS DE CUBA”**



CUBAN ACADEMY OF SCIENCE: % of women

1996-98	30 %
1998-2002	25.9
2002-06	26.4
2006-10	30.8

Today, we are 28 %, acceptable figure, but almost constant !



**Sólo 3 mujeres en el Simposium Latinoamericano de
Física de las Altas Energías
año 2000 !!!**

Workshop Internacional de Matemática numérica, Alemania, 2001

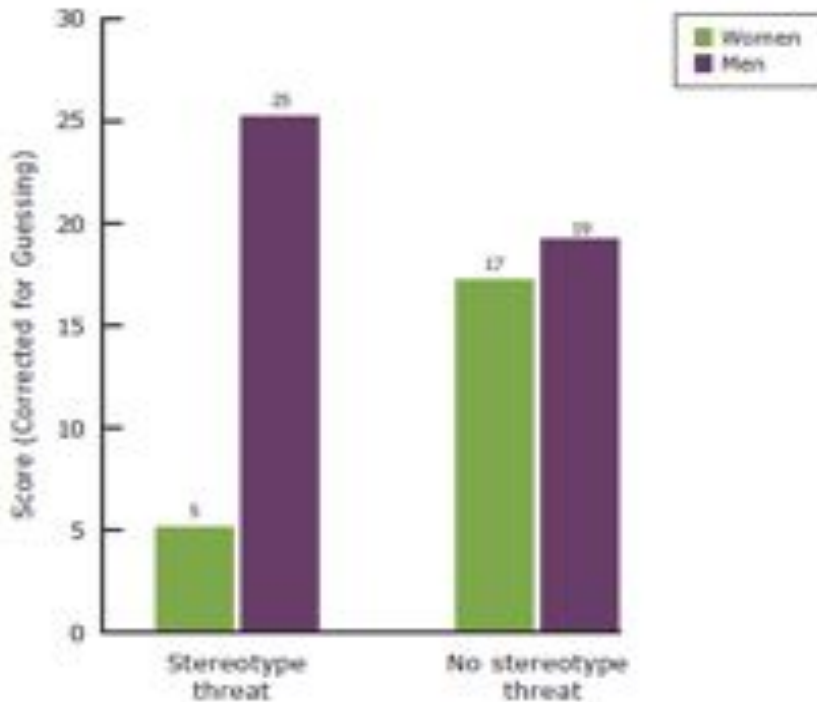


Sólo 5 mujeres !!

Ejemplo sobre la importancia de exponer a las niñas a

MODELOS DE ROL

Performance on a Challenging Math Test,
by Stereotype Threat Condition and Gender



- Expose girls to successful female role models in math and science.
- Teach students about stereotype threat.

Source: Spencer, S. J., Steele, C. M., & Quinn, D. M., 1999, "Stereotype threat and women's math performance," *Journal of Experimental Social Psychology*, 35(1), p. 13.

❖ Si fallamos en motivar y animar a las mujeres, al igual que los hombres a desarrollar carreras científicas, nuestros países perderán una parte sustancial de su potencial.

❖ La participación de la mujer en todas las esferas de la sociedad, y en especial en el campo científico es muy importante y contribuirá a diseñar el futuro.

❖ **La influencia de los**

“modelos de rol” es crucial..

❖ **Nuestro activismo es la única manera de “corregir” el futuro.**

How to reduce the Gap?

- BEST PRACTICES...*Our activism*

Jóvenes Científicas

Un futuro brillante para las Américas

Descubre por qué y cómo
estas jóvenes mujeres
decidieron ser científicas

Tú puedes ser una de ellas!!!





**The Cuban Academy and its
Commission of Women in Sciences
Awards the best women in Basic
Sciences (Physics, Mathematics and
Chemistry)**

"Sofia Kovalievskaja Prize"





CONSEJO INTERNACIONAL PARA LA CIENCIA | OFICINA REGIONAL PARA LATINO AMÉRICA Y EL CARIBE
ICSU | ROLAC

Gaceta



FORTALECIENDO LA CIENCIA INTERNACIONAL PARA EL BENEFICIO DE LA SOCIEDAD

2014 • Número 1

COLUMNISTA INVITADA

¿Por qué las Matemáticas?

ICSU-ROLAC es la única Oficina regional de ICSU que ha incluido el mejoramiento de la enseñanza de la Matemática como línea clave para contribuir al desarrollo económico-social sostenible. Es justo subrayar que ha sido el matemático mexicano José Antonio de la Peña el principal promotor y líder de esta iniciativa.

Es sabido que en el mundo de hoy, el desarrollo y la competencia

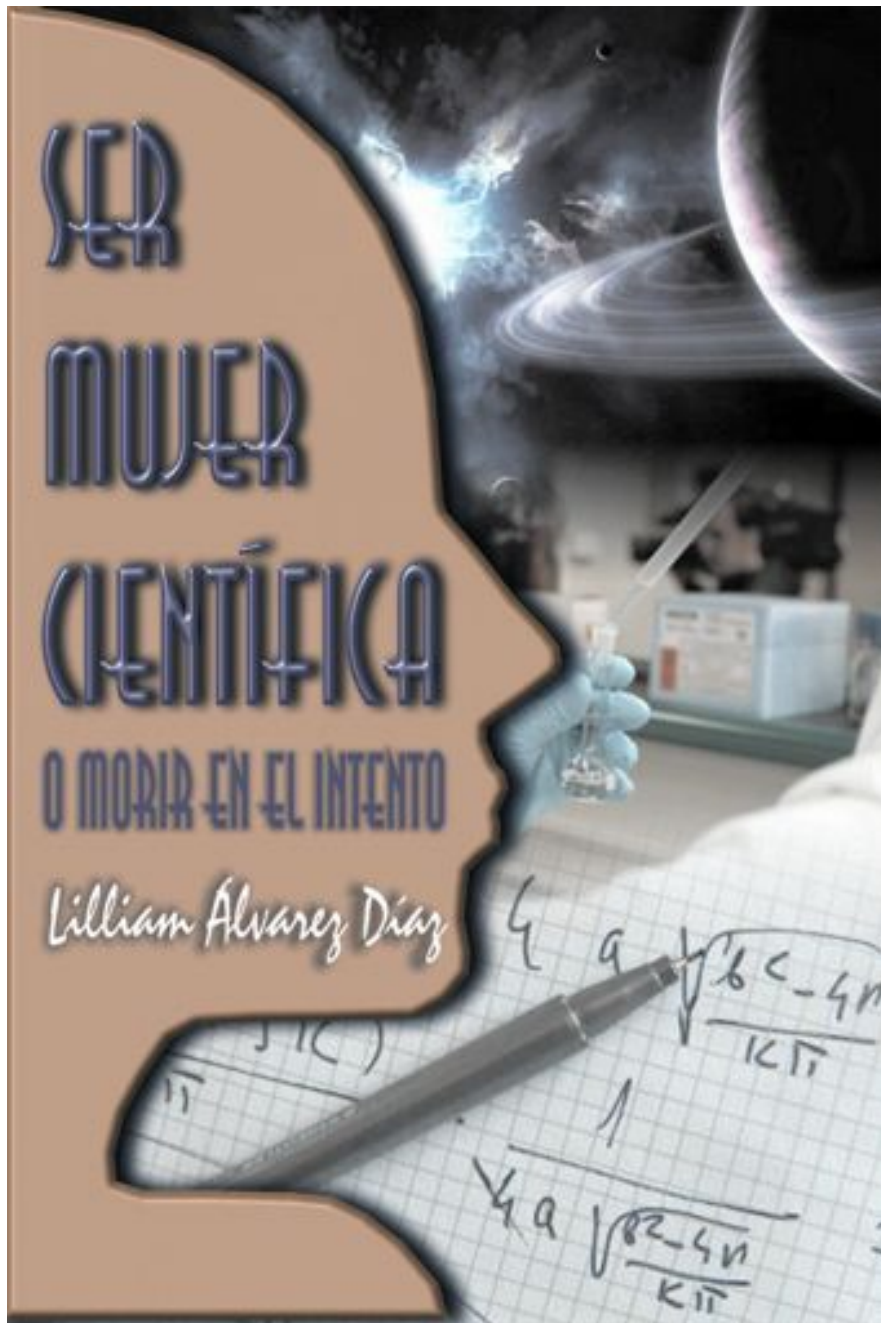
fomentar y desarrollar otras ciencias y tecnologías, y también para la toma de decisiones, en diferentes escalas, desde las altas decisiones gubernamentales, hasta la más simple decisión en el entorno familiar.

En los informes periódicos que hace el PNUD sobre "Adelanto tecnológico" de los diferentes países, utiliza un indicador denominado *Conocimientos*



Lilliam Álvarez Díaz, Miembro del Comité Regional.

la enseñanza de las Matemáticas.



**Motivating
girls
for S&T
and
Math in
particular**

MATHS ARE A MUST FOR PROBLEM-SOLVING

An aversion to mathematics among young people requires broad, creative efforts to encourage skills and raise awareness of its value to society.

By William Andrew Dyer



William Andrew Dyer is a member and executive director of the International Council for Science, which promotes the worldwide field of the Study of Global Development.

Exact sciences are the (back)bone of innovation. For every country, without exception, the capacity for creativity and innovation is strongly related with science, more in physics and chemistry, engineering and mathematics. These sciences produce technologies, generating products with high added value, and in this way that demonstrates how science can drive economic and social development.

Mathematics is a must because it is the first discipline, besides language, that is taught in primary, secondary and tertiary education. Maths provides advantages for verbal reasoning, for learning skills for better student progression, increasing the self-esteem

of maths studies among young people – and there are few indications that this trend is improving. Further, girls are less interested in science education than boys. These gender differences are reflected in the numbers of women choosing academic studies in maths, science and technology. The role of their science and the global reach of enterprises could be using half of available talent.

Mathematics has been declared a priority by the International Council for Science (ICSU) office in Latin America and the Caribbean. Joint efforts by ICSU and national academies must focus urgently on improved education and training of maths teachers, with the input of mathematicians and researchers. Good teacher programs especially designed for basic school teachers are needed.

Olympic Competitions are a popular way to promote Maths skills, but in most of the world may be limited to students who have already shown special ability. And yet such competitions do not appear to have wide impact on maths education. We need more public and democratic concerns, involving the public and involving teachers, families, local schools and even prisons. A long-term project in mathematics education should create a repository with open access teaching resources and best practices in maths education. And we must concentrate on re-shape education for new generations of "digital natives" combining the culture of information and communication technology.

The government and national scientific unions must set attention to these needs in order to influence national policies and education. Mathematics and maths education as priorities



First Meeting on Women in Mathematics, Oaxaca, Mexico, 2016.

The Second meeting will be in Chile, January, 2018.