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National Assessments on Gender and Science, Technology and Innovation

Country Results: Brazil

The National Assessments on Gender and STI project is a collaborative initiative between Women in Global Science and Technology (WISAT), the Organization for Women in Science for the Developing World (OWSD) and futureInnovate.net. The current phase, funded by the Elsevier Foundation, tests the Gender Equality – Knowledge Society (GEKS) framework in six countries and one region: Brazil, India, Indonesia, Republic of Korea South Africa, the USA and the European Union. These countries were chosen because of the size of their STI sector and the existence of an STI policy environment.

The Gender Equality Knowledge Society (GEKS) indicator framework was developed in response to the situation that not only are many women — particularly those in the developing world —on the wrong side of the digital divide, they are on the wrong side of the knowledge divide: worldwide their capacity is grossly under-developed and under-utilized. They are at risk of becoming increasingly marginalized in the knowledge society and related science, technology and innovation systems. Not only do they have less access to information and technology, they are poorly represented in the educational, entrepreneurship and employment opportunities in science, technology and innovation (STI) that base a knowledge society.

The GEKS framework is organized into three sections – Inputs, Outcomes and Enabling Policies, each comprised of key data indicators:

Inputs	Health, social status, economic status, access to resources, agency, opportunity and capability
Enabling Policy Environment	National knowledge society policies; childcare, equal pay, flexible work, infrastructure; CEDAW status; gender mainstreaming in government institutions
Outcomes	Knowledge society decision making; knowledge economy; S&T decision making, STI participation

Results and Findings:

From the national level research and data analysis, preliminary results affirm that women have lower levels of access to the productive resources necessary to support active engagement in the knowledge society – property (land); financing; technology; and education. In turn their representation in employment, entrepreneurship and research is lower in key sectors of the knowledge society, while women in most of the most countries under study are experiencing inequality of opportunity.

Main findings are that the key factors to promote women's participation in national STI and knowledge systems are: economic status, access to resources, and enabling policies.

It is also clear that more consistent and systematic collection of sex-disaggregated data at the national and international levels is necessary to develop the policies that will allow countries to profit from the underutilized potential of their female population.

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Full papers and key findings are found at http://www.wisat.org/programs/national-assessments-on-gender-sti/

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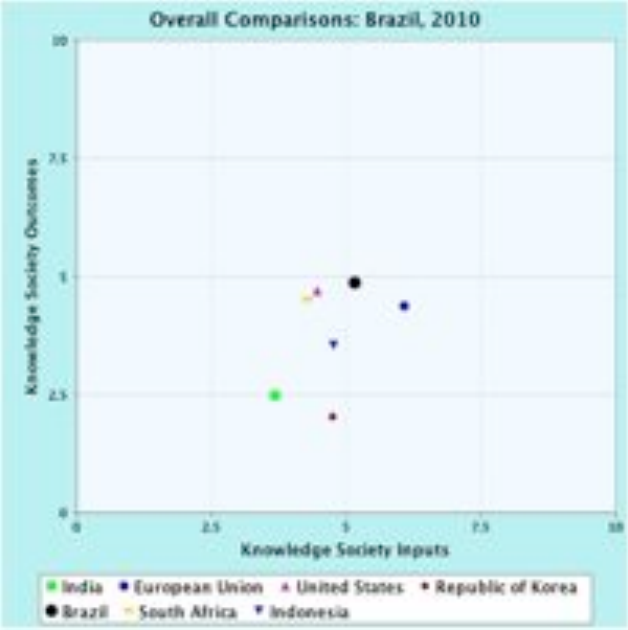
Brazil 2010-11

Key Indicators

Population	196,655,000
Number of females per 100 males	103
Level of Human Development (HDR) / Rank	High - 84
CEDAW signatory	Yes
Percentage of government spending on R&D/STI[1]	1.2



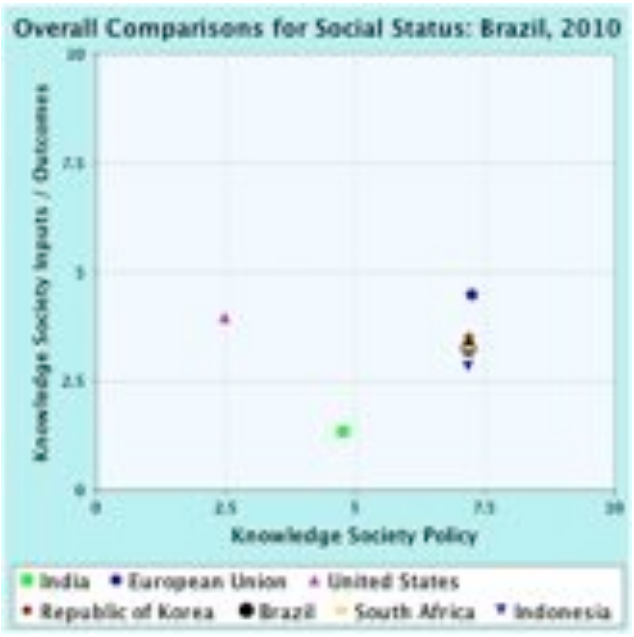
Brazil is ranked the highest of the so-called developing countries, coming in above even the Republic of Korea. It is third overall, first in women's participation in the knowledge economy and science, technology and innovation, as well as agency. It is second in health, opportunity and capabiity and enabling policy, and third in social status, economic status and access to resources. This showing can be attributed to a range of factors, including a strong emphasis on addressing social issues and reducing social inequalities. Specifically gender equality and women's rights have been a strong theme in the country, with steps taken to increase women's rights both inside and outside the home, increase their participation in education and employment, and improve their access to contraceptives. It has also implemented substantive policies and programes to support S&T education for all, including substantive funding to research and education. Brazil makes substantial investment in S&T: the budget for the S&T Ministry has increased by almost 300% over the last ten years, so that today Brazil makes the largest investment in science and technology in Latin America and the Caribbean – about 1.4% of its GDP. Its low ranking (4th) in knowledge society decision-making show where improvement needs to be made in addition to those areas where it ranks third. Interestingly, women spent more hours in unpaid work than men in all countries surveyed except Brazil. Brazil is an example of a country with a highly enabling policy environment for women as well as effective implementation strategies (see Abreu, 2012).

[1] Battelle 2012 Global R&D Funding Forecast

By Dimension

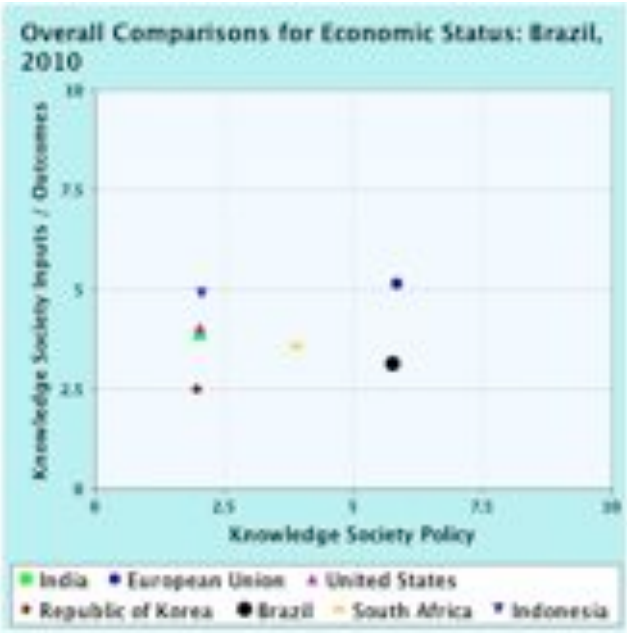
Dimension 1: Health Status. Brazil is no exception to the tendency of female life expectancy at birth to exceed male. The differences between the two are quite similar for 2003 (75 vs 68 - 8 years) and 2007 (76 vs 69 - 7 years). Healthy life expectancy at birth (HALE) is smaller for both women and men. It is noticeable that in the case of HALE, there has been an important increase in the proportion of years that both women and men expect to live in a good health condition. In 2003, the value of female HALE was 62 years, rand 66 in 2007. In case of men, HALE in 2003 was 57, reaching 62 in 2007.

The prevalence and incidence of relevant diseases shows, however, gender differences in the opposite direction. Indicators on the prevalence and incidence of HIV/AIDS reveal that men are more vulnerable than women, with prevalence and incidence among adults aged 15 and over approximately two times higher for men. Similarly, the incidence of malaria is much higher for men than for women in the region where the disease is endemic, the Amazon, and the only region for which sex disaggregated data are available (for 2003 and 2008). Men are more exposed to the mosquito that carries the malaria parasite due to more frequent and intense contact with the forest. The incidence of malaria has decreased over the last decade. Similarly for tuberculosis and hepatitis B and C, female incidence has decreased more during the last decade.



Dimension 2: Social Status. Legislation has recently been enacted mandating more severe penalties for violence against women. Available data may provide only a partial picture, showing that the majority of acts of violence against women are perpetrated by their partners, with threats and physical injuries beng the most frequent type of violence. Hospital admissions for assault indicate similar patterns: aggression by cutting (with penetrating or blunting instrument as the leading type), followed by gun and physical force or abuse. The use of a cutting, penetrating or blunting instrument is the only type of violence for which there was an increase between 1999 and 2007. Gun assaults are the ones which most tend to cause death.

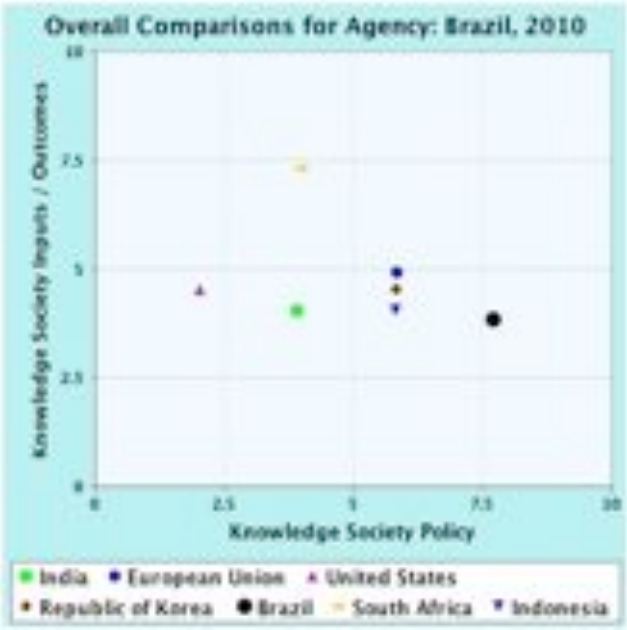
Time use and workload have generally remained stable over the last decade although female workload relative to male has increased slightly: from 80.8% of male workload in 2001 (4.8 hours vs 6.8 for males), to 83.4% in 2009 (4.5 vs 6.4). Brazil is the only country in which male unpaid work exceeds female. Interestingly enough, average hours dedicated to household tasks have decreased for women, both economically active and non-economically active. Black women show a slightly higher working hour average at home than non-black women, though averages have been reduced for both groups.



Dimension 3: Economic Status. With relative economic stability between 2001-2009, Brazilian women have remained economically active and in a position to take advantage of new work opportunities in the industrial and service sectors. They have also attained higher levels of education. Women make up a large minority in the labor market, with a share of 42% in 2001 and 44% in 2009. This small increase has been accompanied by growth in share of the employed population: women made up 40.7% of the employed population in 2001, increasing to to 42.7% in 2009. Women's participation in the labor force increased from 50% to almost 53% of the female population aged 10 or more in 2009 while male participation levels remained stable, at about 72%. Women are concentrated in the service sector, where their participation has increased in comparison to males. Women are also making their way into industry, representing 25.4% in the sector in 2009.

Formal employment grew in Brazil between 2001 and 2009, benefitting both women and men. However, women continue to be overrepresented as domestic workers, a segment characterised by informal work arangements. Female representation in informal and self-employed worker categories has changed little in 2001 and 2009 while male representation has decreased. Neverntheless, the gap in female-to-male earned income ratios has narrowed overall from 63.2% to 67%. For workers with a 40-44 hour work week, female income reached 85.2% of male, up from 78.8% in 2001. Attaining tertiary education has helped women at this level increase their share of male income by five percentage points. Women in the poorest quintile remain vulnerable to unemployment with levels reaching almost ¼ of the economically active poorest women in 2009. The majority of women in this quintile live alone with children, although their numbers have decreased.

Dimension 4: Access to resources. Brazilian legislation does not discriminate against women concerning access to land, any other property, or bank loans. No distinction between sons and daughters are made by inheritance laws and no son preference is noted or affects sex ratio at birth. Considering available indicators, there is no substantial difference between women and men in access to resources. The observed growth of access to internet and cell phones between 2005 and 2009 benefits both sexes, with a small difference favoring men. Females and males have access to infrastructure resources such as electricity and piped sewerage. Differences are seen related to housing conditions. Both women and men living in non-durable dwellings have significantly less access both types of resources with differences according to sex negatively affecting men.



Dimension 5: Women's agency. The number of female ministers under (current president) Dilma Rousseff's tenure has increased to an all-time high. However, political power and influence remain in the domain of men at all legislative levels, from the cabinet office to Senate to municipal chambers. Numbers of women in the Senate have doubled between 2000 and 2010 to 11 (13.6%); while there have been modest increases in the proportion of women in the Federal Chamber (8.8%) and at the municipal legislative level (12.5%). Women are political actors, nevertheless. More than 50% of senior positions in political parties are occupied by women, which is also the case in NGOs and community-based associations – although representation in both seems to have decreased since 2003.

With respect to contraceptive use, in the year 2006 almost 70% of women aged 15-49 were using some sort of protection to prevent a pregnancy, a 25% increase in a decade from just over 50%. Female sterilization has greatly decreased (39%), with numbers of women whose partners more than tripling, a shift partially explained by the growing concern with HIV/AIDS. A minor alternative, male sterilization, has more than doubled between 1996 and 2006.

Dimension 6: Opportunity and capability: Brazilian women have taken up opportunities made possible by a growing education system. Gender parity and almost univeral access characterise both literacy rates and primary education enrollment, while females surpass males in both secondary and tertiary education enrollment. Figures for enrolment in undergraduate and graduate courses (population aged 25-64) also confirm that women are making their way towards creating new opportunities through education.

Dimension 7: Enabling Policy Environment. The Constitution of 1967 established the principle of equality between men and women and included measures against discrimination in the labor force. The 1988 Constitution advanced social rights and expanded the definition of the family, including female-headed households. In 1985 the National Council for Women's Rights (Conselho Nacional dos Direitos da Mulher - CNDM) was created in the Ministry of Justice to promote policies to bar discrimination against women and strengthen their participation in political, economic and cultural activities. In 2003 it became the Special Secretariat for Women's Policies with ministerial status under the Presidency of the Republic. Substantial funding is provided for education and research: over the last decade, the major scholarship and research support institutions granted 60,000 scholarships in 2001 and around 90,000 scholarships in 2008. The Second National Plan for Politics for Women addresses the issue of "strengthening the participation of women in an equal, plural and multiracial way in spaces of decision making; motivating the participation of women in scientific and technological areas". Its Special Secretariat has developed programs focusing on specific themes and concerns, with science and technology one of its priority areas.

Dimension 8: Women in Knowledge Society Decision Making. There have been significant changes in women's share in decision-making positions over 2000-2010. Although women continue to be a minority in political leadership, the proportion of women as state governors more than tripled in 2010 compared to 2000. An increase is also noted for mayors, although not as large. The percentage of female ministers increased from 4% in the Cardoso presidency (1995-1999) to 26% in 2011. The percentage of female ministers at the state level in 2010 was 8.1%, with Secretaries of State 16.5% female, and Secretaries of state capitals 19.6%. In the private sector, the shares of women in President-CEO, Vice President and Director's positions in 2008-9 were 21.4, 17.5 and 26.3% respectively. As well, proportions of women tend also to be higher farther down in the decision-making hierarchy. At the bottom, women occupy more than 50% of management positions. Female membership in the Brazilian Academy of Sciences is not high, although it compares favorably with academies of science in other countries. In 2011, females made up 11.2% of members, down slightly from 13.3% in 2009. This figure has not changed substantially from the beginning of the decade. The Academy has never elected a female president, although one of six regional vice presidents is a woman.

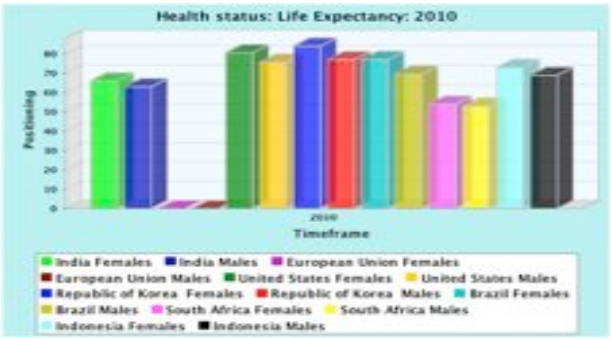
Dimension 9: Women in the knowledge economy. Women are quite highly represented as legislators, senior officials and managers at 44.8%, with technicians and associate professionals ata 55%. While their representation has increased in transport and communications, levels of participation are still low: they make up 13.7% of transport, storage and communication workers. While both men and women are increasing their mastery of computers, in more complex skills women still lag behind men. Data on women's participation among technology and information workers comes from a formal labor market source (so that it does not provide the complete picture), but shows that, overall, women's share has decreased between 2003 (33%) and 2010 (28%). Women hold a leading position in three out of eight technology professions, making up over 60% of workers in "biotechnology professional", "Information professional", and "support technician in biotechnology". Other technology and information areas seem to be less attractive to women, for instance "technology and information manager"; "engineering and technology researcher"; and "information technology administrator".

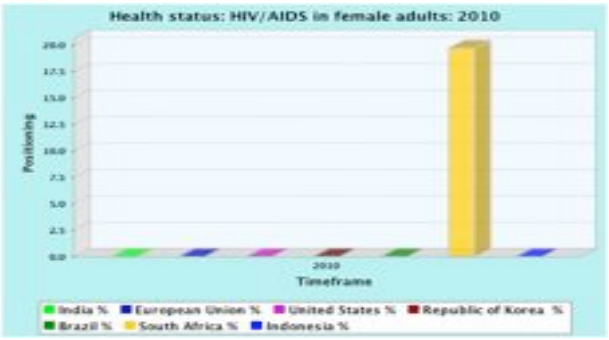
Dimension 10: Women in S&T innovation systems. While females make up over 50% of students at the tertiary level overall, their representation in science, technology and engineering subjects is lower, as is true for all the countries in this study. Females make up over 50% of students in health (58%) and biological (62%) sciences, and 47% in agricultural sciences. representation in the "hard" natural sciences is lower. However, engineering and "exact" sciences see lower rates, of 33 and 37.5% repspectively in 2008. Nevertheless, female enrollments have increased 25% since 2000 in agricultural sciences, 48% in the multidisciplinary area; and 17% in engineering. Again as in all other countries, representation in the science, technology and engineering workforce drops dramatically: although there has been some growth in this sector, overall women's shares fluctuate around 39% of the workforce. Women tend to outnumber men in certain fields – biological and health sciences research, humanities and social sciences research, as professors of biological, health and education sciences, of language and literature, and of arts – and show small increases in representation in fields still dominated by men. Women's representation as researchers in all disciplines is fairly positive: although women are the majority in this category, research group leadership tends to be dominated by men – but female representation at this level has increased from 39% in 2000 to 45% in 2010. Women's share of research productivity scholarship grantees in 2001 and 2010 is fairly stable at around 33%.

Entrepreneurship measures by gender for Brazil show that in 2010, females made up approximately 17% of nascent enterprises, and ran 29% of businesses employing more than one person.

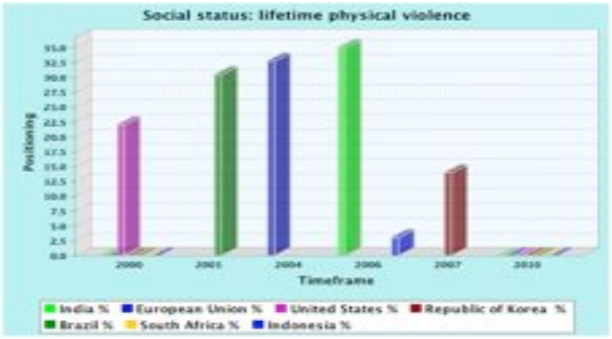
Detailed results by dimension

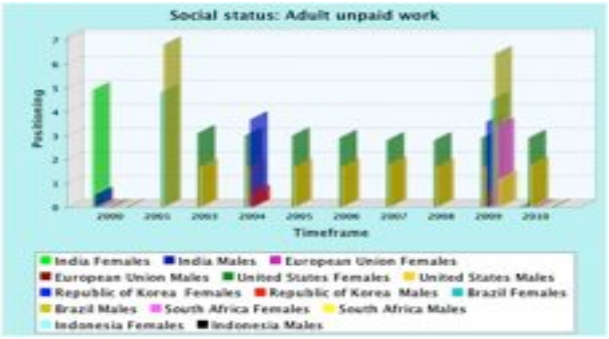
HEALTH STATUS



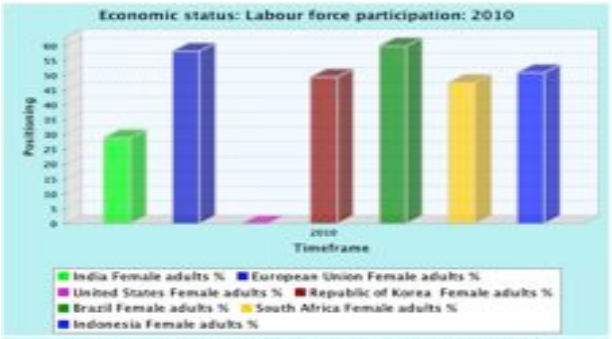


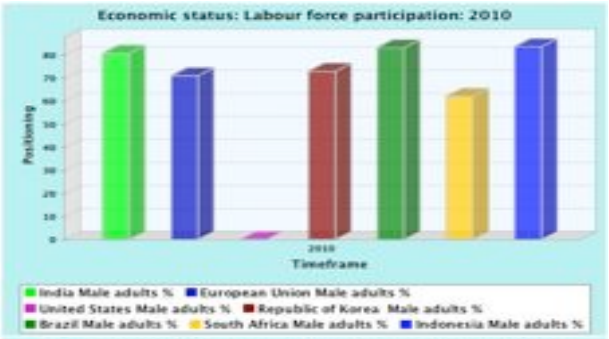
SOCIAL STATUS

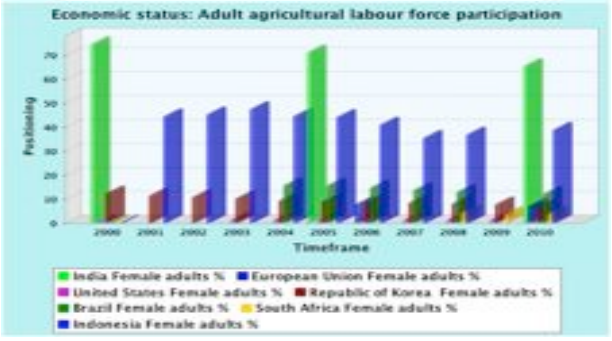




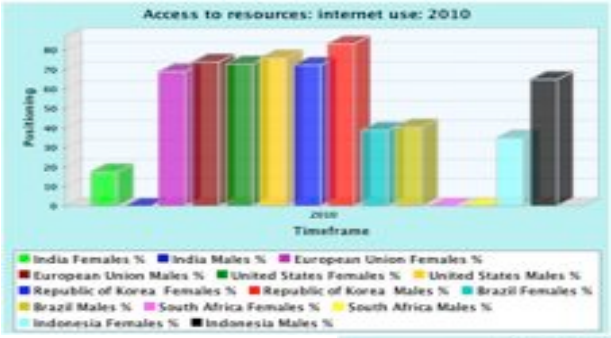
ECONOMIC STATUS

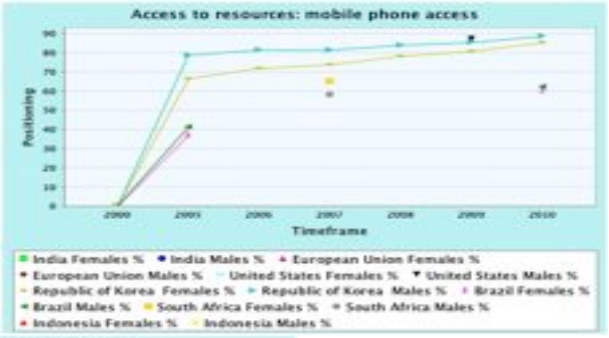


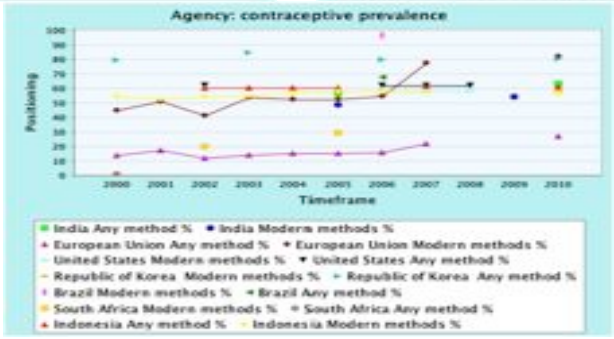




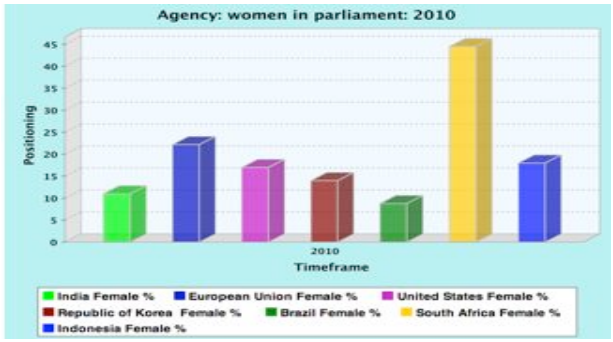
ACCESS TO RESOURCES

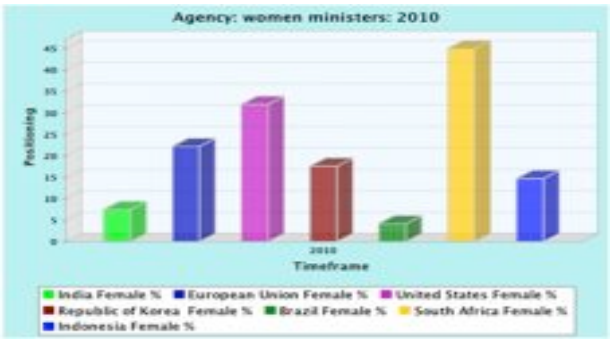




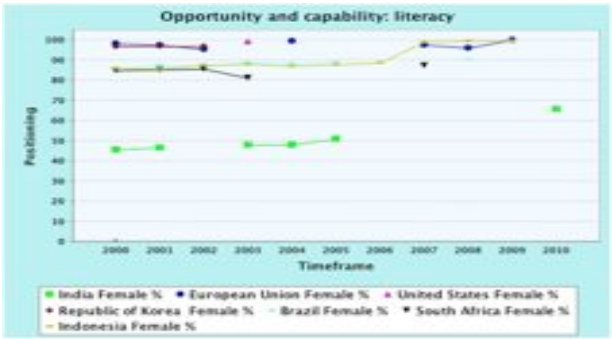


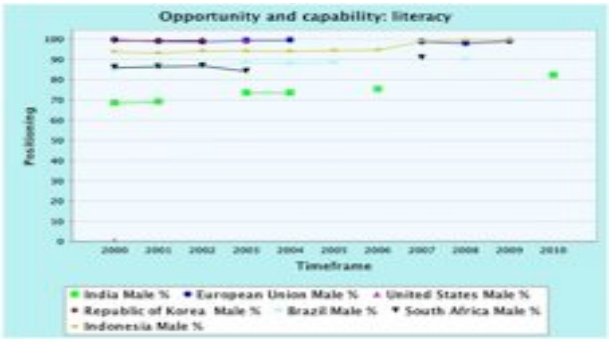
AGENCY

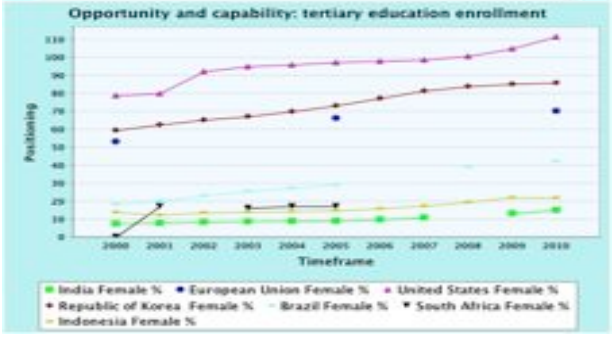


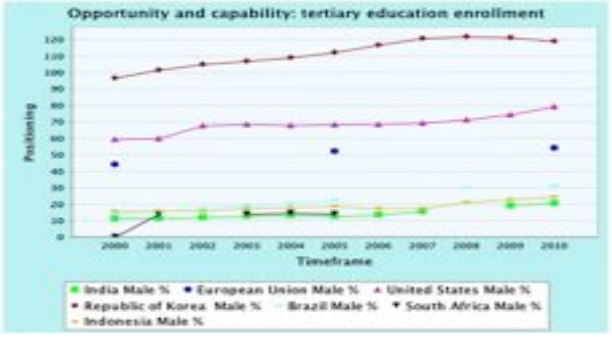


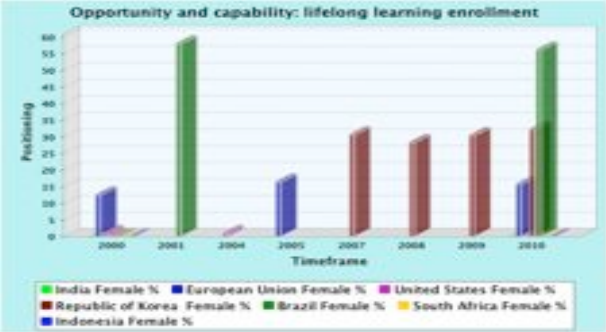
OPPORTUNITY AND CAPABILITY

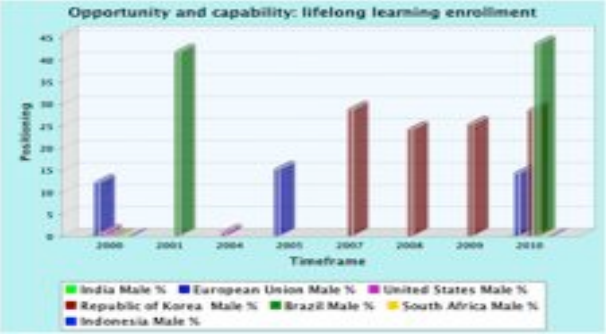




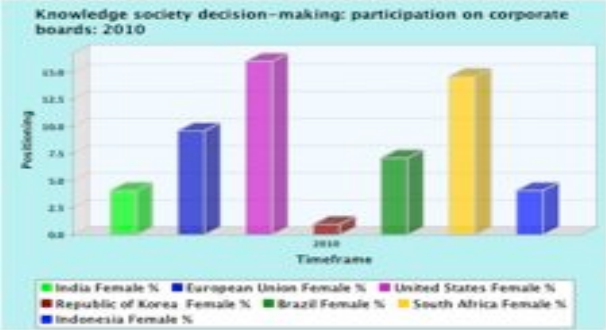


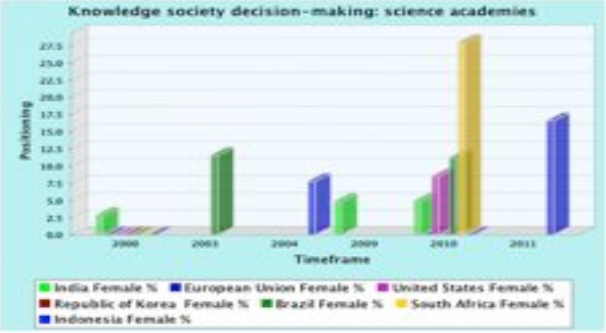




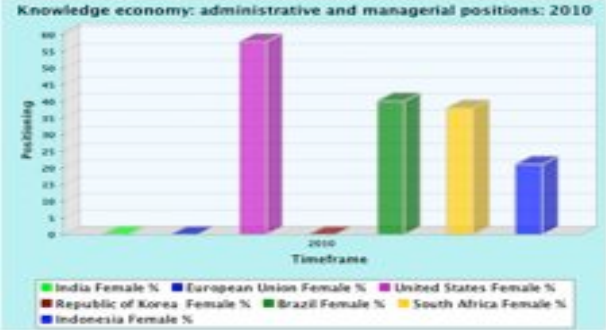


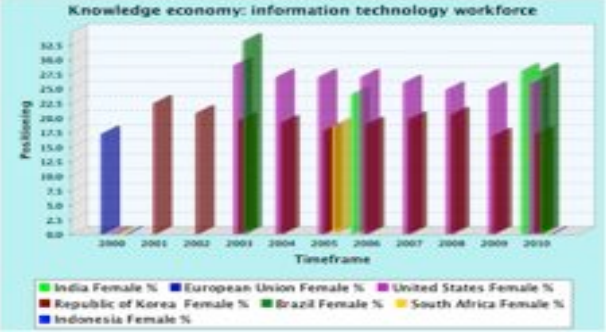
KNOWLEDGE SOCIETY DECISION-MAKING



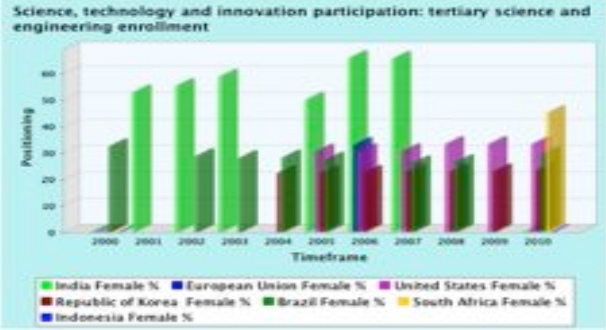


KNOWLEDGE ECONOMY





SCIENCE, TECHNOLOGY AND INNOVATION PARTICIPATION



Summary Data