

A Gendered trend in Scientific and Technological Research among the Developing Countries

Ibiyemi A. JESULEYE, Abayomi T. ALAGA

Cooperative Information Network (COPINE), National Space Research and Development Agency (NASRDA),
Yellow House, OAU Campus, Ile-Ife.

ABSTRACT

The United Nations Development Programme -UNDP- (2005) reported a strong relationship between gender disparity and poverty in Africa. This report corroborates Social Institutions and Gender Index -SIGI- (2012) on a widespread accord around the world that national development, growth and poverty reduction has pre-requisite in gender equality. Technological learning and innovation are vital for economic growth and development and have been ascertained as basic and determinant of long-term improvements in income and socio-economic development among developing countries. Building a favorable environment where incentives promote transactions that transfer technology, many developing countries have authorized national policies and supported international and multilateral agreements to stimulate technology transfer. However, technological convergence and development are still primitive among the developing countries with only a few being successful in building strong science, technology, and innovation capabilities. One of the major reasons of low technological innovation in the developing countries could be traced to persistent gender disparity. UNESCO (2009) revealed that the average share of women in technological research is 33% in Africa and 28% in sub-Saharan Africa, a region where Nigeria belongs. This study reviewed some gendered historical reports on scientific and technological research among the developing countries.

Keywords: Gender Equality, Africa, Science, Technology, Innovation

I. INTRODUCTION

According to WHO (2011), sex could be expressed as the biological and physiological characteristics of women and men, while gender expresses what is expected, permitted and valued in a woman or man in a particular context; Gender refers to the socially constituted norms, roles, and relation that a society regards as an appropriate or normal for men and women.

Gender equality has been found basic in achieving poverty reduction and socio-economic development because of the fact that women play important role in the society through their dynamic contribution to productive activities and their performance as social educators and family caretakers. In particular gender equity in science and technology cannot be over-emphasized (UN, 2011). Viewing a gender perspective

conventionally in science, technology, and innovation (STI) will therefore both enhance social equality and bring significant values across the economic structure and social fabric and countries and the attainment of sustainable development (UN, 2011).

II. METHODS AND MATERIAL

This article sought for facts and figures from relevant literature and statistical reports.

III. FINDINGS AND DISCUSSION

3.1 The indispensability of gender equality in scientific and technological innovation

Innovation through new ideas, products, and practices increasingly is seen as a force for social change. Women account for a minority of the world's

researchers; despite the growing demand for cross-nationally comparable statistics on women in science, national data and their use in policy making often remain limited (UNESCO, 2011). It has been perspicuously acknowledged by the African leaders that socio-economic reformation of the continent would be impossible without increased investments in science, technology, and innovation. This eventuates into several initiatives on concrete actions geared towards promoting the continent's scientific and technological development. Many reports over time have revealed that innovation is often talked about as a gender-neutral activity. Gratton (2007) suggests that teams could be better performance in innovation where there are an equal proportion of men and women. It has been observed that both gender equality and innovation are underpinning factors of the MDGs, and this dovetails into reflecting and performing beyond the existing and predefined parameters.

3.2 Challenges of women in science and technology career

The Organization for Women in Science for the Developing World (OWSD) and Women in Global Science and Technology (WIGSAT) carried out a study on "National Assessment and Benchmarking of Gender, Science, Technology and Innovation" over the European Union, the USA, South Africa, India, Korea and Indonesia in 2010. The study result revealed that though women could enroll in science and technology programs, 30% or more would drop out as a result of lack of flexible work hours and child care (Elsevier connect, 2012). The lead researcher and executive director of WIGSAT, Sophia Huyer, commented that "Women are not having access to professional and income opportunities; in addition, we are missing out on the enormous potential that women represent because they are not participating in how the science and technology sectors are being designed and how they will affect the life of a country." She observed that quality health care, financial resources, higher social and economic status, more significant roles in government and politics are also needed to help a woman achieve parity in the field of science, technology, and innovation. The joint study paid much attention on health, social and economic status, access to resources and opportunities; societal policies such as childcare, equal pay, flexible work hours and participation in decision making. Empirically, the

study showed that in ranking the seven largest knowledge-based economies for gender equality, the European Union ranked first overall; Brazil took first place for women's participation in science, technology and innovation due to its progressive social policies that include state-funded tuition. Korea ranked first in health and life expectancy but last in women's economic status. Even women who are educated are rarely found in public life or in management in the private sector. Summarily, the research shows that pervasive barriers still hinder women's participation in science and technology fields even in the wealthiest nations (Elan, 2012).

3.3 Mainstreaming of gender equality in Africa

AU/NEPAD (2009) stated that over 52% of the African population are women and they contribute significantly to the development of the continent in such areas as agriculture, service industry, informal sectors, and home economy. Nevertheless, they rarely enjoy access to basic services, equal opportunities and are often exempted from the major decision-making process. In recognition of their role and challenges facing African women, the African heads of State, through the Constitutive Act of the African Union, adopted a gender parity principle in 2000. Also through the adoption of the protocol to the African charter on Human and People's Rights on the Rights of women in Africa and signing of the solemn declaration on Gender Equality, the African leaders have demonstrated political commitment to gender equality at the highest level. One of the goals of NEPAD is specifically devoted to the empowerment of women, also all the organs of African Union (AU), including the AU commission (AUC) and NEPAD are committed to ensuring that gender equality is institutionally mainstreamed. AU's gender policy aims at not only that the Convention on the Elimination of Discrimination Against Women (CEDAW) is ratified by each country but also implemented by each member country (AU/NEPAD, 2009). The Gender Working Group (GWG) of the UN Commission on Science and Technology (S&T) for Development [CSTD] carried out a research, about twenty years ago, on national science and technology programs across developing countries. The group empirically examined the differential impact of S and T on the lives of men and women in developing countries with a focus on such sectors as information, employment, education,

agriculture, environment, energy, health, indigenous knowledge and small and medium-sized enterprises. The group was consequently able to establish that gender inequality was a missing link in the national science and technology programs of such countries. Two important observations were also made; (i) serious obstacles existed which prevented girls and women from accessing science education and pursuing careers in S&T. (ii) The technical change had benefited men more than women, largely because S & T policies and programs had not explicitly recognized the gender-specific nature of development. Eventually, the working Group recommended seven “Transformative Action Areas” to support the government of the developing nations in their policy and programs development efforts. The action areas are:

- a) Gender equity in science and technology education;
- b) Removing obstacles to women in scientific and technological career;
- c) Making science responsive to the needs of society;
- d) Making the science and technology decision-making process more “gender aware”;
- e) Relating better with “local knowledge systems”;
- f) Addressing ethical issues in science and technology; and
- g) Improving the collection of gender disaggregated data for policy makers.

An additional area called “Equal opportunity for entry and advancement into large-scale science, technology, engineering and mathematics (STEM) and innovation system, was also identified by the UN-CSTD in 2006. (WIGSAT, 2014)

3.4 Women’s input in scientific and technological innovation

Much of the enhancement in human welfare over the past century are underpinned by scientific and technological innovations, (Juma and Yee-cheong, 2005), this can even be confidently expressed in the present time. Women’s participation in creating, transmitting, processing knowledge and the elimination of gender disparities in having access to information and scientific and technological knowledge is crucial in addressing inequalities and promoting human development (UN, 2010).

Only a few national policies on science and technology (S&T) address gender equality (UN, 2011). The UN report informed that the gap of not addressing gender equality is often present due to lack of understanding of:

- a. the role of women in social and economic development
- b. the role of S&T in addressing the challenge faced by a woman in fulfilling their roles as food producers, social educators, caregivers for their families and
- c. The real and potential contribution of women to research, development and innovation.

Gender inequality is a major challenge in sub-Saharan Africa (SSA) countries. A gender inequality index report by UNDP shows that 61% loss of human development is due to gender inequality, which is significantly high (UNDP, 2011).

3.5 African women’s under-representation in research

Human and infrastructure investment in research and development are fundamental in generating knowledge and for laying the foundation for scientific and technological innovation. Viable scientific and technological capacity development is critical for developing the foundation for a knowledge base society. Hence, there is a need for nations to establish and maintain an indigenous science and technology workforce that would not be limited to consuming other nations’ technological export, but which will also create, acquires, assimilate and export science and technology knowledge (UNESCO, 2007). This dovetail to the fact that seasoned researchers, professionals and technicians are required to coordinate in each country, the expansion of science, technology, and innovation capacity. It is evident that in this dispensation where science and technology based knowledge is becoming a determining factor of economic competitiveness, woman is sparingly represented in sub-Saharan Africa among researchers, professional and technicians (UN, 2010).

UNESCO statistics of 2009 shows that the average shares of a woman in research are 33% in Africa and 28% in sub-Saharan Africa (UNESCO 2009). A major reason for women’s under-representation in R&D as identified by UN (2010) in that they are less likely than men to obtain a tertiary level qualification in science,

technology, and engineering fields, which are pre-requisite for a career in scientific research. Others are

- a. Lack of good work-life balance policies: this limits women's participation because they often perform paid work alongside heavy family responsibilities.
- b. Rigid employment practices: This and lack of opportunities for retraining can lead to skilled woman quitting science and technology profession out rightly.

Factors (a) and (b) mentioned of course do affect both male and female, however, women folks are more affected by the reason of maternity leave and family caregiving assignments.

IV.CONCLUSION

In other to address the issues hindering women's participation in technological research and development, the gender working group identified seven transformative action areas in 1995. Two decades after which women are still significantly under-represented in technology R&D (28%) in sub-Saharan Africa. This is practically a pointer to the fact that gender disparity is still operating in Africa and that the appropriate actions should still be intensified for operative gender equity in order to enable the women folks participate optimally in scientific and technological researches and innovations.

V. REFERENCES

- [1]. Gratton, L. (2007). Innovative Potential: Men and Women in Teams. The Lehman Brothers Center for Women in Business, London School of Economics. http://www.london.edu/assets/documents/faculty_andresearch/Innovative_Potential_NOV_2007.pdf [Accessed May 3, 2010].
- [2]. Elan, S. (2012). http://www.researchinformation.info/news/news_story.php?news_id=1018 . accessed on Dec. 30, 2014.
- [3]. UNESCO. (2011). Education for All Global Monitoring Report 2011: Regional overview: sub-Saharan Africa. Paris, France, UNESCO.
- [4]. Transformation Actions as identified in the Report of the Gender Working Group, UN Commission on Science and Technology for Development, Missing Links: Gender Equity in Science and Technology for Development , 1995
- [5]. Wigsat (2014). <http://gab.wigsat.org>
- [6]. UN (2010).The World's Women 2010: Trends and Statistics. United Nations Department of Economic and Social Affairs, ST/ESA/STAT/SER.K/19; New York, USA.
- [7]. UNESCO, 2007. Science, Technology and Gender: An International Report. Paris: UNESCO.
- [8]. UNESCO (2011) The unEsCO world Atlas of gender Equality in Education, available at <http://unesdoc.unesco.org/images/0021/002155/215522E.pdf>.
- [9]. OECD Development Centre (2012). 2012 SIGI (Social Institutions and Gender Index): Understanding the drivers of gender inequality.
- [10]. United Nations, 2009. International Standard Industrial Classification of all Economic Activities, Revision 4. Sales No.: E.08.XVII.25.
- [11]. International Center for Research on Woman (ICRW)
- [12]. ICRW Washington DC, USA "Innovation for women's empowerment and gender equality."
- [13]. Elan, S. (2012). Gender inequality continues in science and technology. Research information Thomson rentals publishers
- [14]. NEPAD (2009). Science, technology and renovation for public health in Africa.
- [15]. AU/NEPAD, 2009. The AU/NEPAD African action plan 2010 to 2015 advancing regional and continental integration Africa.
- [16]. UN (2011). mainstreaming a gender perspective in science technology and innovation policies. United Nation Commission on the status of women, New York.
- [17]. WIGSAT (2014). <http://gab.wigsat.org>